

# chapter one

## LEARNING, TEACHING, AND EDUCATIONAL PSYCHOLOGY

WHAT WOULD YOU DO? ▼

### **TEACHERS' CASEBOOK:** Leaving No Student Behind

It is your second year as a teacher in the Lincoln East school district. Over the last 4 years, the number of students from immigrant families has increased dramatically in your school. In your class, you have two students who speak Somali, one Hmong, one Farsi, and four Spanish speakers. Some of them know a little English, but many have very few words other than "OK." If there had been more students from each of the language groups, the district would have given your school additional resources and special programs in each language, providing you extra help, but there are not quite enough students speaking most of the languages to meet the requirements. In addition, you have several students with special needs; learning disabilities, particularly problems in reading, seem to be the most common. Your state and district require you to prepare *all* your students for the achievement tests in the spring, and the national emphasis is on readiness for college and career by the end of high school—for *everyone*. Your only possible extra resource is a student intern from the local college.

#### **CRITICAL THINKING**

- What would you do to help all your students to progress and prepare for the achievement tests?
- How would you make use of the intern so that both she and your students learn?
- How could you involve the families of your non-English-speaking students and students with learning disabilities to support their children's learning?



Anita Woolfolk Hoy

## OVERVIEW AND OBJECTIVES

Like many students, you may begin this course with a mixture of anticipation and wariness. Perhaps you are required to take educational psychology as part of a program in teacher education, speech therapy, nursing, or counseling. You may have chosen this class as an elective. Whatever your reason for enrolling, you probably have questions about teaching, schools, students—or even about yourself—that you hope this course may answer. I have written the 14th edition of *Educational Psychology* with questions such as these in mind.

In this first chapter, we begin with the state of education in today's world. Teachers have been both criticized as ineffective and lauded as the best hope for young people. Do teachers make a difference in students' learning? What characterizes good teaching—how do truly effective teachers think and act? What do they believe about students, learning, and themselves? When you are aware of the challenges and possibilities of teaching and learning today, you can appreciate the contributions of educational psychology.

After a brief introduction to the world of the teacher, we turn to a discussion of educational psychology itself. How can principles identified by educational psychologists benefit teachers, therapists, parents, and others who are interested in teaching and learning? What exactly is the content of educational psychology, and where does this information come from? Finally, we consider an overview of a model that organizes research in educational psychology to identify the key student and school factors related to student learning (J. Lee & Shute, 2010). My goal is that you will become a confident and competent beginning teacher, so by the time you have completed this chapter, you should be able to:

- Objective 1.1 Describe the key elements of the No Child Left Behind Act and its successor, the Every Student Succeeds Act, and discuss the continuing impact of testing and accountability for teachers and students.
- Objective 1.2 Discuss the essential features of effective teaching, including different frameworks describing what good teachers do.
- Objective 1.3 Describe the methods used to conduct research in the field of educational psychology and the kinds of questions each method can address.
- Objective 1.4 Recognize how theories and research in development and learning are related to educational practice.

## OUTLINE

### Teachers' Casebook—Leaving No Student Behind: What Would You Do?

#### Overview and Objectives

#### Learning and Teaching Today

- Students Today: Dramatic Diversity and Remarkable Technology
- Confidence in Every Context
- High Expectations for Teachers and Students
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### Teachers' Casebook—Leaving No Student Behind: What Would They Do?

## LEARNING AND TEACHING TODAY

Welcome to my favorite topic—educational psychology—the study of development, learning, motivation, teaching, and assessment in and out of schools. I believe this is one of the most important courses you will take to prepare for your future as an educator in the classroom or the consulting office, whether your “students” are children or adults learning how to read or individuals discovering how to improve their diets. In fact, there is evidence that new teachers who have course work in development and learning are twice as likely to stay in teaching (National Commission on Teaching and America’s Future, 2003). This may be a required course for you, so let me make the case for educational psychology, first by stepping into classrooms today.

### Students Today: Dramatic Diversity and Remarkable Technology

Who are the students in American classrooms today? Here are a few statistics about the United States.

- The United States is a land of immigrants. About 25% of U.S. children under 18 are living in immigrant families (Turner, 2015). It is likely that by 2060, nearly 20% of the U.S. population will be foreign born, and people of Hispanic origin will comprise almost 30% of that population. By 2044, more than half of the U.S. population will be members of some minority group (Colby & Ortman, 2015).
- Almost 15 million children—about 22% of all children—live in poverty, defined in 2017 by the U.S. Department of Health and Human Services as an income of \$24,600 for a family of four (\$30,750 in Alaska and \$28,290 in Hawaii). And in the public schools, just over half the students qualify for free or reduced cost lunches—a rough indicator of poverty (Southern Education Foundation, 2015). At 22%, the United States has the *second highest* rate of child poverty among the 35 economically advantaged countries of the world, just above Romania and below Bulgaria. Iceland, the Scandinavian countries, Cyprus, and the Netherlands have the lowest rates of child poverty, about 7% or less (Ann E. Casey Foundation, 2015; Children’s Defense Fund, 2015; National Center for Child Poverty, 2013; UNICEF, 2012).
- The typical Black household has about 6% of the wealth of the typical White household. The figure for Hispanic households is 8% (Shin, 2015).
- About one in six American children have a mild-to-severe developmental disability such as speech and language impairments, intellectual disabilities, cerebral palsy, or autism. Over half of these children spend most or their time in general education classes (Centers for Disease Control, 2015c).
- In 2012, for children ages birth to 17, 20% had parents who were divorced or separated, 11% were living with someone who had an alcohol or drug problem, 7% had a parent who had served time in jail, and 9% lived with someone who was mentally ill (Child Trends, 2013).

Based on statistics such as these, Erica Turner (2015) concluded, “American society and schools are more diverse and more unequal than ever” (p. 4). In contrast, because of the effects of mass media, these diverse students share many similarities today, particularly the fact that most are far more technologically literate than their teachers. For example:

- Infants to 8-year-olds spend an average of almost 2 hours each day watching TV or videos, 29 minutes listening to music, and 25 minutes working with computers or

computer games. In 2013, 75% of homes with children under age 8 had a smartphone, tablet, or other mobile device (Common Sense Media, 2012, 2013b). Today the numbers probably have increased.

- According to a 2015 Pew Research survey, 92% of 13- to 17-year-olds said they went online daily, and 24% were online “almost constantly.” This is possible because 88% of teenagers have access to some kind of mobile phone and most of these (73%) are smartphones. And 71% of teens use more than one social media site; Facebook, Instagram, and Snapchat are the most popular (Lenhart, 2015).

These statistics are dramatic but a bit impersonal. As a teacher, counselor, recreational worker, speech therapist, or family member, you will encounter real children. In this book, you will meet many individuals such as Josué, a bright first grader whose first language is Spanish, struggling to care about learning read in a language that offers only, “run Spot, run”; Alex, an 11-year-old who has created 10 languages and 30 or 40 alphabets; Jamie Foxx, a very bright third-grade student in a small, Texas town whose teacher rewards him for working hard all week by letting him do stand-up comedy for the class on Fridays; Tracy, a failing high school student who does not understand why her study strategies are failing her; Felipe, a fifth-grade boy from a Spanish-speaking family who is working to learn school subjects and make friends in a language that is new to him; Ternice, an outspoken African American girl in an urban middle school who is hiding her giftedness; Trevor, a second-grade student who has trouble with the meaning of *symbol*; Allison, head of a popular clique and tormentor of the outcast Stephanie; Eliot, a bright sixth-grade student with severe learning disabilities; and Jessie, a student in a rural high school who just doesn’t seem to care about her sinking grade-point average (GPA) or school in general.

Even though students in classrooms are increasingly diverse in race, ethnicity, language, and economic level, teachers are much less diverse—the percentage of White teachers is increasing (now about 90%), while the percentage of Black teachers is falling, down to about 7%. Clearly, it is important for all teachers to know and be able to work effectively with all their students. Several chapters in this book are devoted to understanding these diverse students. In addition, many times within each chapter, we will explore student diversity and inclusion through research, cases, and practical applications.

### Confidence in Every Context

Schools are about teaching and learning; all other activities are secondary. But teaching and learning in the contexts just described can be challenging for both teachers and students. This book is about understanding the complex processes of development, learning, motivation, teaching, and assessment so that you can become a capable and confident teacher.

Much of my own research has focused on **teachers’ sense of efficacy**, defined as a teacher’s belief that he or she can reach even difficult students to help them learn. This confident belief appears to be one of the few personal characteristics of teachers that predict student achievement (Çakiroğlu, Aydın, & Woolfolk Hoy, 2012; Woolfolk Hoy, Hoy, & Davis, 2009). Teachers with a high sense of efficacy work harder and persist longer even when students are difficult to teach, in part because these teachers believe in themselves and in their students. Also, they are less likely to experience burnout and more likely to be satisfied with their jobs (Fernet, Guay, Senécal, & Austin, 2012; Fives, Hamman, & Olivarez, 2005; Klassen & Chiu, 2010).

I have found that prospective teachers tend to increase in their personal sense of efficacy as a consequence of completing student teaching. But sense of efficacy may decline after the first year as a teacher, perhaps because the support that was provided during student teaching is gone (Woolfolk Hoy & Burke-Spero, 2005). Teachers’ sense of efficacy is higher in schools when the other teachers and administrators have high expectations for students and the teachers receive help from their principals in solving instructional and management problems (Capa, 2005). Efficacy grows from real success

#### Teachers’ sense of efficacy

A teacher’s belief that he or she can reach even the most difficult students and help them learn.

with students, not just from the moral support or cheerleading of professors and colleagues. Any experience or training that helps you succeed in the day-to-day tasks of teaching will give you a foundation for developing a sense of efficacy in your career. This book was written to provide the knowledge and skills that form a solid foundation for an authentic sense of efficacy in teaching.

## High Expectations for Teachers and Students

In 2002, President George W. Bush signed into law the No Child Left Behind (NCLB) Act. Actually, NCLB was the latest authorization of the Elementary and Secondary Education Act (ESEA), first passed in 1965. In a nutshell, NCLB required that all students in grades 3 through 8 and once more in high school take annual standardized achievement tests in reading and mathematics. In addition, they had to be tested in science once in each grade span: elementary, middle, and high school. Based on these test scores, schools were judged to determine if their students were making adequate yearly progress (AYP) toward becoming proficient in the subjects tested. States and schools had to develop AYP goals and report scores separately for several subgroups, including racial and ethnic minority students, students with disabilities, students whose first language is not English, and students from low-income homes. But no matter how states defined these standards, NCLB required that all students reach proficiency by the end of the 2013–2014 school year. You probably noticed—this did not happen.

For a while, NCLB dominated education. Testing expanded. Schools and teachers were penalized if they did not perform. For example, if a school underperformed for 5 years, federal money could be taken away, teachers and principals could be fired, and schools could be converted to charter schools or closed. As you can imagine, or may have experienced yourself, such high-stakes penalties pushed teachers and schools to “teach to the test” or worse. The curriculum narrowed and much time was spent on drill and practice. Cheating was a problem and graduation requirements were dumbed down in some high schools to avoid receiving penalties (Davidson, Reback, Rockoff, & Schwartz 2015; Meens & Howe, 2015; Strauss, 2015).

With all this focus on test preparation, some schools and states seemed to make progress toward their AYP goals, but too many schools were labeled as failing. A closer look at these successes and failures showed that the states used very different formulas and procedures for calculating AYP, so we can’t really compare results across states (Davidson et al., 2015). All in all, NCLB requirements were widely criticized as “blunt instruments, generating inaccurate performance results, perverse incentives, and unintended negative consequences” (Hopkins et al., 2013, p. 101).

NCLB was supposed to be reauthorized in 2007 or 2008, but this process was not completed until December 10, 2015 when President Barack Obama signed the **Every Student Succeeds Act (ESSA)**. The main differences between ESSA and NCLB are that the requirement for proficiency for all students by a certain date has been dropped, most control is returned to the states to set standards and develop interventions, and penalties are no longer central to the law. A few key changes include:

1. Schools still must test the same subjects in the same grades, and at least 95% of students must participate in the testing. But the local districts now can decide when to test, whether to break one big test into several smaller tests, and even how to find better tests that really capture important student learning. Accountability plans have to be submitted to the Department of Education. In these plans, test scores and graduation rates have to be given greater weight than other more subjective measures, but at least one additional measure of school quality such as school climate and safety or student engagement must be included, along with measures of progress toward English language proficiency for English learners (Korte, 2015).
2. The schools still have to gather data about different subgroups of students, but they are not penalized if the students in these groups do not perform, unless the underperformance persists over time.

**Every Student Succeeds Act (ESSA)** The 2015 replacement for the No Child Left Behind Act. ESSA drops the requirement for proficiency for all students by a certain date has been dropped and returns most control to the states to set standards and develop interventions.

3. Only schools at the bottom 5% of test scores, schools that graduate less than two-thirds of their students, and schools where subgroups consistently underperform will be considered failing. The states must intervene in these schools with “evidence-based” programs, but ESSA leaves the decisions about which interventions to use to the state (Strauss, 2015).
4. States are allowed to adopt the Common Core Standards (see Chapter 14), but there are no federal incentives or pressures to do so. The goal is for high school graduates to be college and career ready.
5. States are now required to fund “equitable services” for children in private and religious schools if those students are eligible for special services. This could be a problem for many states that do not have enough money now to adequately fund these services in public schools (Strauss, 2015).
6. ESSA also emphasizes increased access to preschool by including new funding for early childhood education (Wong, 2015).

Even though these seem to be major changes, the actual effects for many states and schools may not be too dramatic. By 2015, the Secretary of Education had waived the requirement to reach 100% proficiency for 42 states and the District of Columbia. To get the waivers, the states had to show they had adopted their own testing and accountability programs and were making progress toward the goal of college or career readiness for all their graduates. In other words, these 42 states and the District of Columbia already were operating under the main provisions of ESSA (Meens & Howe, 2015; Wong, 2015).

One provision of the ESSA of interest to all teachers and teacher educators is a provision that establishes teacher education academies. The types of academies favored are nontraditional, non-university, and for-profit programs that don't have to meet the standards of university programs. Many teacher educators worry that this step will lower the quality of new teachers (Strauss, 2015).

Time will tell how the new ESSA law unfolds, especially with the election of Donald Trump as President. Many excellent teachers still believe they are spending too much time preparing for tests and not enough time supporting student learning in subjects not tested, such as social studies, art, music, physical education, and technology (Cusick, 2015). But no matter what policies the government adopts, capable and confident teachers will be required. Is that true? Do teachers really make a difference? Good question.

## Do Teachers Make a Difference?

You saw in the statistics presented earlier that many American children are growing up in poverty. For a while, some researchers concluded that wealth and social status, not teaching, were the major factors determining who learned in schools (e.g., Coleman, 1966). In fact, much of the early research on teaching was conducted by educational psychologists who refused to accept these claims that teachers were powerless in the face of poverty and societal problems (Wittrock, 1986).

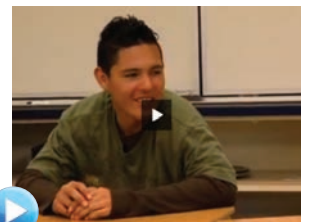
How can you decide whether teaching makes a difference? Perhaps one of your teachers influenced your decision to become an educator. Even if you had such a teacher, and I hope you did, one of the purposes of educational psychology in general and this text in particular is to go beyond individual experiences and testimonies, powerful as they are, to examine larger groups. The results of many large-group studies speak to the power of teachers in the lives of students, as you will see next.

**TEACHER-STUDENT RELATIONSHIPS.** Bridgett Hamre and Robert Pianta (2001) monitored all the children who entered kindergarten one year in a small school district and continued in that district through the eighth grade. The researchers concluded that the quality of the teacher-student relationship in kindergarten (defined in terms of level of conflict with the child, the child's dependency on the teacher, and the teacher's affection for the child) predicted a number of academic and behavioral outcomes *through the eighth grade*, particularly for students with many behavior problems.



### MyLab Education Podcast 1.1

In this podcast, textbook author Anita Woolfolk talks about the importance of teachers in students' lives. Did you know that “teacher involvement and caring are the most significant predictors of a student's engagement in school from first grade through twelfth grade?” Listen to learn more.



### MyLab Education Video Example 1.1

A bilingual teacher conducts a discussion with immigrant high school students. She asks students to discuss what teachers can do to help English learners and students from different cultures.

Even when the gender, ethnicity, cognitive ability, and behavior ratings of the student were accounted for, the relationship with the teacher still predicted aspects of school success. So students with significant behavior problems in the early years are less likely to have problems later in school if their first teachers are sensitive to their needs and provide frequent, consistent feedback.

It appears that the connection between teacher relationships and student outcomes is widespread. Deborah Roorda and her colleagues (2011) reviewed research from 99 studies around the world that examined the connections between teacher–student relationships and student engagement. Positive teacher relationships predicted positive student engagement at every grade, but the relationships were especially strong for students who were at risk academically and for older students. As an example, Russell Bishop and his colleagues (2014) observed 1,263 secondary teachers who taught the indigenous Maori students of New Zealand. The researchers found that when teachers established warm, caring relationships with their students, similar to those of an extended family, the students were more engaged. In fact, without such relationships there was no engagement. So evidence is mounting for a strong association between the quality of teacher–child relationships and school performance.

**THE COST OF POOR TEACHING.** In a widely publicized study, researchers examined how students are affected by having several effective or ineffective teachers in a row (Sanders & Rivers, 1996). They looked at fifth graders in two large metropolitan school systems in Tennessee. Students who had highly effective teachers for third, fourth, and fifth grades scored at the 83rd percentile on average on a standardized mathematics achievement test in one district and at the 96th percentile in the other (99th percentile is the highest possible score). In contrast, students who had the least effective teachers 3 years in a row averaged at the 29th percentile in math achievement in one district and 44th percentile in the other—a difference of over 50 percentile points in both cases! Students who had average teachers or a mixture of teachers with low, average, and high effectiveness for the 3 years had math scores between these extremes. Sanders and Rivers concluded that the best teachers encouraged good-to-excellent gains in achievement for all students, but lower-achieving students were the first to benefit from good teaching. The effects of teaching were cumulative and residual; that is, better teaching in a later grade could partially make up for less effective teaching in earlier grades, but could not erase all the deficits traced to poor teachers (Hanushek, Rivkin, & Kain, 2005; Rivkin, Hanushek, & Kain, 2001).

Another study about test score gains from the Los Angeles public schools may be especially interesting to you. Robert Gordon and his colleagues (2006) measured the test performance of elementary school students in *beginning teachers'* classes. Teachers were ranked into quartiles based on how well their students performed during the teachers' first 2 years. Then the researchers looked at the test performance of students in classes with the top 25% of the teachers and the bottom 25% during their third year of teaching. After controlling for the effects of students' prior test scores, their families' wealth, and other factors, they found that the students working with the top 25% of the teachers gained an average of 5 percentile points more compared to students with similar beginning of the year test scores, while students in the bottom 25% lost an average of 5 percentile points. If these losses accumulate, then students working with poorer teachers would fall farther and farther behind. In fact, the researchers speculated that “. . . having a top-quartile teacher four years in a row would be enough to close the black-white test score gap” [of about 34 percentile points] (R. Gordon, Kane, & Staiger, 2006, p. 8).

Effective teachers who establish positive relationships with their students appear to be a powerful force in those students' lives. Students who have problems seem to benefit the most from good teaching. So an important question is, “What makes a teacher effective? What is good teaching?”

## WHAT IS GOOD TEACHING?

Educators, psychologists, philosophers, novelists, journalists, filmmakers, mathematicians, scientists, historians, policy makers, and parents, to name only a few groups, have examined this question; there are hundreds of answers. And good teaching is not confined to classrooms. It occurs in homes and hospitals, museums and sales meetings, therapists' offices, and summer camps. In this book we are primarily concerned with teaching in classrooms, but much of what you will learn applies to other settings as well.

### Inside Three Classrooms

To begin our examination of good teaching, let's step inside the classrooms of three outstanding teachers. The three situations are real. The first two teachers worked with my student teachers in local elementary and middle schools and were studied by one of my colleagues, Carol Weinstein (Weinstein & Romano, 2015). The third teacher became an expert at helping students with severe learning difficulties, with the guidance of a consultant.

**A BILINGUAL FIRST GRADE.** Most of the 25 students in Viviana's class have recently emigrated from the Dominican Republic; the rest come from Nicaragua, Mexico, Puerto Rico, and Honduras. Even though the children speak little or no English when they begin school, by the time they leave in June, Viviana has helped them master the normal first-grade curriculum for their district. She accomplishes this by teaching in Spanish early in the year to aid understanding and then gradually introducing English as the students are ready. Viviana does not want her students segregated or labeled as disadvantaged. She encourages them to take pride in their Spanish-speaking heritage and uses every available opportunity to support their developing English proficiency.

Both Viviana's expectations for her students and her commitment to them are high. She has an optimism that reveals her dedication: "I always hope that there's somebody out there that I will reach and that I'll make a difference" (Weinstein & Romano, 2015, p. 15). For Viviana, teaching is not just a job; it is a way of life.

**A SUBURBAN FIFTH GRADE.** Ken teaches fifth grade in a suburban school in central New Jersey. Students in the class represent a range of racial, ethnic, family income, and language backgrounds. Ken emphasizes "process writing." His students complete first drafts, discuss them with others in the class, revise, edit, and "publish" their work. The students also keep daily journals and often use them to share personal concerns with Ken. They tell him of problems at home, fights, and fears; he always takes the time to respond in writing. Ken also uses technology to connect lessons to real life. Students learn about ocean ecosystems by using a special interactive software program. For social studies, the class plays two simulation games that focus on history. One is about coming of age in Native American cultures, and the other focuses on the colonization of America.

Throughout the year, Ken is very interested in the social and emotional development of his students; he wants them to learn about responsibility and fairness as well as science and social studies. This concern is evident in the way he develops his class rules at the beginning of the year. Rather than specifying do's and don'ts, Ken and his students devise a "Bill of Rights" for the class, describing the rights of the students. These rights cover most of the situations that might need a "rule."

**AN INCLUSIVE CLASS.** Eliot was bright and articulate. He easily memorized stories as a child, but he could not read by himself. His problems stemmed from severe learning difficulties with auditory and visual integration and long-term visual memory. When he tried to write, everything got jumbled. Dr. Nancy White worked with Eliot's teacher, Mia Russell, to tailor intensive tutoring that specifically focused on Eliot's individual learning patterns and his errors. With his teachers' help, over the next years, Eliot became an expert on his own learning and was transformed into an independent learner; he knew which strategies he had to use and when to use them. According to Eliot, "Learning that stuff is not fun, but it works!" (Hallahan & Kauffman, 2006, pp. 184–185).

### Connect and Extend to PRAXIS II®

#### Teacher Professionalism (IV, A2)

Begin your own development by reading educational publications. One widely read periodical is *Education Week*. You can access it online at [edweek.com](http://edweek.com).



What do you see in these three classrooms? The teachers are confident and committed to their students. They must deal with a wide range of students: different languages, different home situations, and different abilities and learning challenges. They must adapt instruction and assessment to students' needs. They must make the most abstract concepts, such as ecosystems, real and understandable for their particular students. The whole time these experts are navigating through the academic material, they also are taking care of the emotional needs of their students, propping up sagging self-esteem, and encouraging responsibility. If we followed these teachers from the first day of class, we would see that they carefully plan and teach the basic procedures for living and learning in their classes. They can efficiently collect and correct homework, regroup students, give directions, distribute materials, and deal with disruptions—and do all of this while also making a mental note to find out why one of their students is so tired. Finally, they are **reflective**—they constantly think back over situations to analyze what they did and why, and to consider how they might improve learning for their students.



#### MyLab Education Video Example 1.2

Teachers must be both knowledgeable and inventive. They must be able to use a range of strategies, and they must also be capable of inventing new strategies. In this video, the teacher knows her students and uses strategies that help each student learn. Observe how she supports students who are English language learners, and observe her method of grouping students to meet diverse needs.

**Reflective** Thoughtful and inventive. Reflective teachers think back over situations to analyze what they did and why, and to consider how they might improve learning for their students.

**SO WHAT IS GOOD TEACHING?** Is good teaching science or art: the application of research-based theories or the creative invention of specific practices? Is a good teacher an expert explainer—“a sage on the stage” or a great coach—“a guide by the side”? These debates have raged for years. In your other education classes, you probably will encounter criticisms of the scientific, teacher-centered sages. You will be encouraged to be inventive, student-centered guides. *But beware of either/or choices.* Teachers must be both knowledgeable and inventive. They must be able to use a range of strategies, and they must also be capable of inventing new strategies. They must have some basic research-based routines for managing classes, but they must also be willing and able to break from the routine when the situation calls for change. They must know the research on student development, and they also need to know their own particular students who are unique combinations of culture, gender, and geography. Personally, I hope you all become teachers who are both sages and guides, wherever you stand.

Another answer to “What is good teaching?” involves considering what different models and frameworks for teaching have to offer. We look at this next.

**MODELS OF GOOD TEACHING: TEACHER OBSERVATION AND EVALUATION.** In the last few years, educators, policy makers, government agencies, and philanthropists have spent millions of dollars identifying what works in teaching and specifically how to identify good teaching. These efforts have led to a number of models for teaching and teacher evaluation systems. We will briefly examine three to help answer the question, “What is good teaching?” Another reason to consider these models is that when you become a teacher, you may be evaluated based on one of these approaches, or something like them—teacher evaluation is a very hot topic these days! We will look at Charlotte Danielson’s Framework for Teaching, the high-leverage practices identified by TeachingWorks at the University of Michigan, and the Measures of Effective Teaching project sponsored by the Bill and Melinda Gates Foundation.

**Danielson’s Framework for Teaching.** The *Framework for Teaching* was first published in 1996 and has been revised three times since then, the latest in 2013 (see [danielsongroup.org](http://danielsongroup.org) for information about Charlotte Danielson and the *Framework for Teaching*). According to Charlotte Danielson (2013):

The Framework for Teaching identifies those aspects of a teacher’s responsibilities that have been documented through empirical studies and theoretical research as promoting improved student learning. While the Framework is not the only possible description of practice, these responsibilities seek to define what teachers should know and be able to do in the exercise of their profession. (p. 3)

Danielson’s Framework has 4 domains or areas of responsibility: *Planning and Preparation*, *Classroom Environment*, *Instruction*, and *Professional Responsibilities*. Each domain is further divided into 5 or 6 components, making a total of 22 components for the

entire framework. For example, Domain 1: Planning and Preparation, is divided into 6 components:

- 1a Demonstrating knowledge of content and pedagogy
- 1b Demonstrating knowledge of students
- 1c Setting instructional objectives
- 1d Demonstrating knowledge of resources
- 1e Designing coherent instruction
- 1f Designing student assessments

When the Framework is used for teacher evaluation, each of these 22 components is further divided into elements (76 in all), and several indicators are specified for each component. For example, component 1b, demonstrating knowledge of students, includes the elements describing knowledge of

- child and adolescent development
- the learning process
- students' skills, knowledge, and language proficiency
- students' interests and cultural heritage
- students' special needs

Indicators of this knowledge of students include the formal and informal information about students that the teacher gathers when planning instruction, the students' interests and needs the teacher identifies, the teacher's participation in community cultural events, opportunities the teacher has designed for families to share their cultural heritages, and any databases the teacher has for students with special needs (Danielson, 2013).

The evaluation system further defines four levels of proficiency for each of the 22 components: unsatisfactory, basic, proficient, and distinguished, with a definition, critical attributes, and possible examples of what each level might look like in action. Two examples of distinguished knowledge of students are a teacher who plans lessons with three different follow-up activities designed to match different students' abilities and a teacher who attends a local Mexican heritage event to meet members of her students' extended families. Many other examples are possible, but these two give a sense of distinguished knowledge of students (component 1b).

You can see that it would take extensive training to use this framework well for teacher evaluation. When you become a teacher, you may learn more about this conception of good teaching because your school district is using it. For now, be assured that you will gain knowledge and skills in all 22 components in this text. For example, you will gain knowledge of students (component 1b) in Chapters 2 through 6.

**TeachingWorks.** TeachingWorks is a national project based at the University of Michigan and dedicated to improving teaching practice. Project members working with experienced teachers have identified 19 high-leverage teaching practices, defined as actions that are central to teaching and useful across most grade levels, academic subjects, and teaching situations. The TeachingWorks researchers call these practices “a set of ‘best bets,’ warranted by research evidence, wisdom of practice, and logic” ([teachingworks.org/work-of-teaching/high-leverage-practices](http://teachingworks.org/work-of-teaching/high-leverage-practices)). These practices are specific enough to be taught and observed, so they can be a basis for teacher learning and evaluation. See Table 1.1 on the next page for these 19 practices. Again, you will develop skills and knowledge about all of these practices in this text. (For a more complete description of the 19 high-leverage practices, see [teachingworks.org/work-of-teaching/high-leverage-practices](http://teachingworks.org/work-of-teaching/high-leverage-practices).)

When you compare the high-leverage practices in Table 1.1 with the Danielson components listed earlier, do you see similarities and overlaps?

**Measures of Teacher Effectiveness.** In 2009, the Bill and Melinda Gates Foundation launched the Measures of Teaching Effectiveness (MET) Project, a research partnership between 3,000 teachers and research teams at dozens of institutions. The goal was clear from the title—to build and test measures of effective teaching. The Gates Foundation

TABLE 1.1 • TeachingWorks 19 High-Leverage Teaching Practices

These practices are based on research evidence, the wisdom of practice, and logic.

1. Making content (e.g., specific texts, problems, theories, processes) explicit through explanation, modeling, representations, and examples
2. Leading a whole-class discussion
3. Eliciting and interpreting individual students' thinking
4. Establishing norms and routines for classroom discourse and work that are central to the subject-matter domain
5. Recognizing particular common patterns of student thinking and development in a subject-matter domain
6. Identifying and implementing an instructional response or strategy in response to common patterns of student thinking
7. Teaching a lesson or segment of instruction
8. Implementing organizational routines, procedures, and strategies to support a learning environment
9. Setting up and managing small group work
10. Engaging in strategic relationship-building conversations with student
11. Setting long- and short-term learning goals for students referenced to external benchmarks
12. Appraising, choosing, and modifying tasks and texts for a specific learning goal
13. Designing a sequence of lessons toward a specific learning goal
14. Selecting and using particular methods to check understanding and monitor student learning during and across lessons
15. Composing, selecting, and interpreting and using information from quizzes, tests and other methods of summative assessment
16. Providing oral and written feedback to students on their work
17. Communicating about a student with a parent or guardian
18. Analyzing instruction for the purpose of improving it
19. Communicating with other professionals

Source: Reprinted with permission from TeachingWorks (2014), *High-leverage practices*. Retrieved from <http://www.teachingworks.org/work-of-teaching/high-leverage-practices>

tackled this problem because research shows that teachers matter; they matter more than technology or funding or school facilities. In pursuing the goal, the project members made a key assumption. Teaching is complex; multiple measures will be needed to capture effective teaching and provide useful feedback for personnel decisions and professional development. In addition to using student achievement gains on state tests, the MET researchers examined many established and newer measures of effectiveness and content knowledge. The final report of the project (MET Project, 2013) identified the following three measures that are used together as a valid and reliable way of assessing teaching that leads to student learning:

1. Student *gains on state tests*.
2. Surveys of *student perceptions* of their teachers based on the Tripod Student Perception Survey developed by Ron Ferguson at Harvard University (R. F. Ferguson, 2008). This survey asks students to agree or disagree with statements such as “My teacher takes time to help us remember what we learn” (for K–2 students); “In class we learn to correct our mistakes (upper elementary students); and “In this class, my teacher accepts nothing less than our full effort” (secondary students) (from Cambridge Education, Tripod Project, Student Survey System).
3. *Classroom observations* from the Danielson (2013) Framework for Teaching.

Remember, teaching is complex. To capture effective teaching, these measures have to be used accurately and together. Also, in both state tests and tests of higher-level thinking, the best combination of reliability and prediction of student gains comes when gains on standardized tests are weighted between 33% and 50% in assessing effectiveness, with student perception and class observation results providing the rest of the information (MET Project, 2013).

Are you surprised that evaluating a teacher's content knowledge for the subject taught did not make the cut in measuring teacher effectiveness? So far, math seems to be the one area where teacher knowledge is related to student learning, but with better

measures of teacher knowledge, we may find more relationships (Gess-Newsome, 2013; Goe, 2013; MET Project, 2013).

Is all this talk about expert teachers and effective teaching making you a little nervous? Viviana, Ken, and Mia are experts at the science and art of teaching, but they have years of experience. What about you?

## Beginning Teachers

**STOP & THINK** Imagine walking into your first day of teaching. List the concerns, fears, and worries you have. What assets do you bring to the job? What would build your confidence to teach? •

Beginning teachers everywhere share many concerns, including maintaining classroom discipline, motivating students, accommodating differences among students, evaluating students' work, dealing with parents, and getting along with other teachers (Conway & Clark, 2003; Melnick & Meister, 2008; Veenman, 1984). Many teachers also experience what has been called “reality shock” when they take their first job because they really cannot ease into their responsibilities. On the first day of their first job, beginning teachers face the same tasks as teachers with years of experience. Student teaching, while a critical element, does not really prepare prospective teachers for starting off a school year with a new class. If you listed any of these concerns in your response to the *Stop & Think* question, you shouldn't be troubled. They come with the job of being a beginning teacher (Borko & Putnam, 1996; Cooke & Pang, 1991).

With experience, hard work, and good support, seasoned teachers can focus on the students' needs and judge their success by their students' accomplishments (Fuller, 1969; Pigge & Marso, 1997). One experienced teacher described the shift from concerns about yourself to concerns about your students in this way: “The difference between a beginning teacher and an experienced one is that the beginning teacher asks, ‘How am I doing?’ and the experienced teacher asks, ‘How are the children doing?’” (Codell, 2001, p. 191).

My goal in writing this book is to give you the foundation for becoming an expert as you gain experience. One thing experts do is listen to their students. Table 1.2 shows some advice a first-grade class gave to their student teacher: It looks like the students know about good teaching, too.

TABLE 1.2 • Advice for Student Teachers from Their Students

The students in Ms. Amato's first-grade class gave this advice as a gift to their student teacher on her last day.

1. Teach us as much as you can.
2. Give us homework.
3. Help us when we have problems with our work.
4. Help us to do the right thing.
5. Help us make a family in school.
6. Read books to us.
7. Teach us to read.
8. Help us write about faraway places.
9. Give us lots of compliments, like “Oh, that's so beautiful.”
10. Smile at us.
11. Take us for walks and on trips.
12. Respect us.
13. Help us get our education.

Source: Nieto, Sonia, *Affirming diversity: The sociopolitical context of multicultural education*, 4th ed., © 2004. Reprinted and Electronically reproduced by permission of Pearson Education, Inc. Upper Saddle River, New Jersey.

I began this chapter claiming that educational psychology is the one of the most important courses you will take. OK, maybe I am a bit biased—I have been teaching the subject for over four decades! So let me tell you more about my favorite topic.

### Connect and Extend to PRAXIS II®

#### Teacher Professionalism (IV, A1)

Your professional growth relies on your becoming a member of a community of practice. The national organizations listed here have hundreds of affiliations and chapters across the country with regular conferences, conventions, and meetings to advance instruction in their areas. Take a look at their Web sites to get a feel for their approaches to issues related to professionalism.

- National Council of Teachers of English (ncte.org)
- International Reading Association (reading.org)
- National Science Teachers Association (nsta.org)
- National Council for the Social Studies (ncss.org)
- National Council of Teachers of Mathematics (nctm.org)

## THE ROLE OF EDUCATIONAL PSYCHOLOGY

For as long as the formal study of educational psychology has existed—over 100 years—there have been debates about what it really is. Some people believe educational psychology is simply knowledge gained from psychology and applied to the activities of the classroom. Others believe it involves applying the methods of psychology to study classroom and school life (Brophy, 2003). A quick look at history shows that educational psychology and teaching have been closely linked since the beginning.

### In the Beginning: Linking Educational Psychology and Teaching

In one sense, educational psychology is very old. Issues Plato and Aristotle discussed—the role of the teacher, the relationship between teacher and student, methods of teaching, the nature and order of learning, the role of emotion in learning—are still topics in educational psychology today. But let's fast forward to recent history. From the beginning, psychology in the United States was linked to teaching. At Harvard in 1890, William James founded the field of psychology and developed a lecture series for teachers entitled *Talks to Teachers about Psychology*. These lectures were given in summer schools for teachers around the country and then published in 1899. James's student, G. Stanley Hall, founded the American Psychological Association. Teachers helped him collect data for his dissertation about children's understandings of the world. Hall encouraged teachers to make detailed observations to study their students' development—as his mother had done when she was a teacher. Hall's student John Dewey founded the Laboratory School at the University of Chicago and is considered the father of the progressive education movement (Berliner, 2006; Hilgard, 1996; Pajares, 2003). Another of William James's students, E. L. Thorndike, wrote the first educational psychology text in 1903 and founded the *Journal of Educational Psychology* in 1910.

### Educational Psychology Today

What is educational psychology today? The view generally accepted is that **educational psychology** is a distinct discipline with its own theories, research methods, problems, and techniques. Educational psychologists do research on learning and teaching and, at the same time, work to improve educational policy and practice (Anderman, 2011). To understand as much as possible about learning and teaching, educational psychologists examine what happens when someone (a teacher or parent or software designer) teaches something (math or weaving or dancing) to someone else (student or co-worker or team) in some setting (classroom or theater or gym) (Berliner, 2006; Schwab, 1973). So educational psychologists study child and adolescent development; learning and motivation—including how people learn different academic subjects such as reading or mathematics; social and cultural influences on learning; teaching and teachers; and assessment, including testing (Alexander & Winne, 2006).

But even with all this research on so many topics, are the findings of educational psychologists really that helpful for teachers? After all, most teaching is just common sense, isn't it? Let's take a few minutes to examine these questions.

### Is It Just Common Sense?

In many cases, the principles set forth by educational psychologists—after spending much thought, time, and money for research—sound pathetically obvious. People are tempted to say, and usually do say, “Everyone knows that!” Consider these examples.

#### Educational psychology

The discipline concerned with teaching and learning processes; applies the methods and theories of psychology and has its own as well.

**HELPING STUDENTS.** When should teachers provide help for lower-achieving students as they do class work?

**Commonsense Answer.** Teachers should offer help often. After all, these lower-achieving students may not know when they need help or they may be too embarrassed to ask for help.

**ANSWER BASED ON RESEARCH.** Sandra Graham (1996) found that when teachers provide help before students ask, the students and others watching are more likely to conclude that the student who was given assistance does not have the ability to succeed. The student is more likely to attribute failures to lack of ability instead of lack of effort, so motivation suffers.

**SKIPPING GRADES.** Should a school encourage exceptionally bright students to skip grades or to enter college early?

**Commonsense Answer.** No! Very intelligent students who are several years younger than their classmates are likely to be social misfits. They are neither physically nor emotionally ready for dealing with older students and would be miserable in the social situations that are so important in school, especially in the later grades.

**ANSWER BASED ON RESEARCH.** Maybe. The first two conclusions in the report *A Nation Deceived: How Schools Hold Back America's Brightest Children* are: (1) Acceleration is the most effective curriculum intervention for children who are gifted, and (2) for students who are bright, acceleration has long-term beneficial effects, both academically and socially (Colangelo, Assouline, & Gross, 2004). One example of positive long-term effects is that mathematically talented students who skipped grades in elementary or secondary school were more likely to go on to earn advanced degrees and publish widely cited articles in scientific journals (Park, Lubinski, & Benbow, 2013). Whether acceleration is the best solution for a student depends on many specific individual characteristics, including the intelligence and maturity of the student as well as the other available options. For some students, moving quickly through the material and working in advanced courses with older students can be a very positive experience (Kretschmann, Vock, & Lüdtke, 2014). See Chapter 4 for more on adapting teaching to students' abilities.

**STUDENTS IN CONTROL.** Does giving students more control over their own learning—more choices—help them learn?

**Commonsense Answer.** Of course! Students who choose their own learning materials and tasks will be more engaged and thus learn more.

**ANSWER BASED ON RESEARCH.** Not so fast! Sometimes giving students more control and choice can support learning, but many times it does not. For example, giving lower-ability students choice in learning tasks sometimes means the students just keep practicing what they already do well instead of tackling tougher assignments. This happened when hairdressing students were given choices. The lower-ability students kept practicing easy tasks such as washing hair but were reluctant to try more difficult projects such as giving permanents. When they developed portfolios to monitor their progress and received regular coaching and advice from their teachers, the students made better choices—so guided choice and some teacher control may be useful in some situations (Kicken, Brand-Gruwel, van Merriënboer, & Slot, 2009).

**OBVIOUS ANSWERS?** Years ago, Lily Wong (1987) demonstrated that just seeing research results in writing can make them seem obvious. She selected 12 findings from research on teaching. She presented 6 of the findings in their correct form and 6 in exactly the opposite form to both college students and experienced teachers. Both the college students and the teachers rated about half of the wrong findings as “obviously” correct.

Recently, Paul Kirschner and Joren van Merriënboer (2013) made a similar point when they challenged several “urban legends” in education about the assertion that learners (like the hairdressing students just described) know best how to learn. These current, strongly held beliefs about students as self-educating digital natives who can multitask, have unique learning styles, and always make good choices about how to learn *have no strong basis in research*, but they are embraced nonetheless.

You may have thought that educational psychologists spend their time discovering the obvious. The preceding examples point out the danger of this kind of thinking. When a principle is stated in simple terms, it can sound simplistic. A similar phenomenon takes place when we see a professional dancer or athlete perform; the well-trained performer makes it look easy. But we see only the results of the training, not all the work that went into mastering the individual movements. And bear in mind that any research finding—or its opposite—may sound like common sense. The issue is not what *sounds* sensible, but what is *demonstrated* when the principle is put to the test in research—our next topic (Gage, 1991).

## Using Research to Understand and Improve Learning

**STOP & THINK** Quickly, list all the different research methods you can think of. •

Educational psychologists design and conduct many different kinds of research studies. Some of these are **descriptive studies**—their purpose is simply to describe events in a particular situation.

**CORRELATION STUDIES.** Often, the results of descriptive studies include reports of correlations. You will encounter many correlations in the coming chapters, so let's take a minute to examine this concept. A **correlation** is a number that indicates both the strength and the direction of a relationship between two events or measurements. Correlations range from +1.00 to -1.00. The closer the correlation is to either +1.00 or -1.00, the stronger the relationship. For example, the correlation between adult weight and height is about .70 (a strong relationship); the correlation between adult weight and number of languages spoken is about .00 (no relationship at all).

The sign of the correlation tells the direction of the relationship. A **positive correlation** indicates that the two factors increase or decrease together. As one gets larger, so does the other. Weight and height are positively correlated because greater weight tends to be associated with greater height. A **negative correlation** means that *increases* in one factor are related to *decreases* in the other, for example, the less you pay for a theater or concert ticket, the greater your distance from the stage. It is important to note that correlations do not prove cause and effect (see Figure 1.1). For example, weight and

### Descriptive studies

Studies that collect detailed information about specific situations, often using observation, surveys, interviews, recordings, or a combination of these methods.

**Correlations** Statistical descriptions of how closely two variables are related.

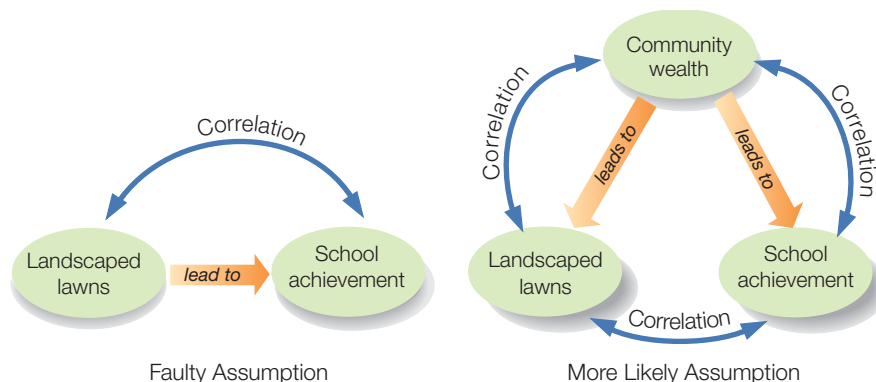
**Positive correlation** A relationship between two variables in which the two increase or decrease together. Example: calorie intake and weight gain.

**Negative correlation** A relationship between two variables in which a high value on one is associated with a low value on the other. Example: height and distance from top of head to the ceiling.

FIGURE 1.1

### CORRELATIONS DO NOT SHOW CAUSATION

When research shows that landscaped lawns and school achievement are correlated, it does not show causation. Community wealth, a third variable, may be the cause of both school achievement and landscaped lawns.



height are correlated—but gaining weight obviously does not *cause* you to grow taller. Knowing a person's weight simply allows you to make a general prediction about that person's height. Educational psychologists identify correlations so they can make predictions about important events in the classroom.

**EXPERIMENTAL STUDIES.** A second type of research—**experimentation**—allows educational psychologists to go beyond predictions and actually study cause and effect. Instead of just observing and describing an existing situation, the investigators introduce changes and note the results. First, a number of comparable groups of participants are created. In psychological research, the term **participants** (also called **subjects**) generally refers to the people being studied—such as teachers or ninth graders. One common way to make sure that groups of participants are essentially the same is to assign each person to a group using a random procedure. **Random** means each participant has an equal chance of being in any group. **Quasi-experimental studies** meet most of the criteria for true experiments, with the important exception that the participants are not assigned to groups at random. Instead, existing groups such as classes or schools participate in the experiments.

In experiments or quasi-experiments, for one or more of the groups studied, the experimenters change some aspect of the situation to see if this change or “treatment” has an expected effect. The results in each group are then compared, often using statistics. When differences are described as **statistically significant**, it means that they probably did not happen simply by chance. For example, if you see  $p < .05$  in a study, this indicates that the result reported could happen by chance less than 5 times out of 100, and  $p < .01$  means less than 1 time in 100.

A number of the studies we will examine attempt to identify cause-and-effect relationships by asking questions such as this: If some teachers receive training in how to teach spelling using word parts (*cause*), will their students become better spellers than students whose teachers did not receive training (*effect*)? This actually was a *field experiment* because it took place in real classrooms and not in a simulated laboratory situation. In addition, it was a *quasi-experiment* because the students were in existing classes and had not been randomly assigned to teachers, so we cannot be certain the experimental and control groups were the same before the teachers received their training. The researchers handled this by looking at improvement in spelling, not just final achievement level, and the results showed that the training worked (Hurry et al., 2005).

**ABAB EXPERIMENTAL DESIGNS.** The goal of ABAB designs is to determine the effects of a therapy, teaching method, or other intervention by first observing the participants for a baseline period (A) and assess the behavior of interest; then trying an intervention (B) and noting the results; then removing the intervention and go back to baseline conditions (A); and finally reinstating the intervention (B). This form of design can help establish a cause-and-effect relationship (Plavnick & Ferreri, 2013). For example, a teacher might record how much time students are out of their seats without permission during a weeklong baseline period (A). The teacher then tries ignoring those who are out of their seats, but praises those who are seated, again recording how many are wandering out of their seats for the week (B). Next, the teacher returns to baseline conditions (A) and records results, and then reinstates the praise-and-ignore strategy (B). When this intervention was first tested, the praise-and-ignore strategy proved effective in increasing the time students spent in their seats (C. H. Madsen, Becker, Thomas, Koser, & Plager, 1968).

**CLINICAL INTERVIEWS AND CASE STUDIES.** Jean Piaget pioneered an approach called the *clinical interview* to understand children's thinking. The clinical interview uses open-ended questioning to probe responses and to follow up on answers. Questions go wherever the child's responses lead. Here is an example of a clinical interview with a 7-year-old. Piaget is trying to understand the child's thinking about lies and truth, so he asks, “What is a lie?”

**Experimentation** Research method in which variables are manipulated and the effects recorded.

**Participants/subjects** People or animals studied.

**Random** Without any definite pattern; following no rule.

**Quasi-experimental studies** Studies that fit most of the criteria for true experiments, with the important exception that the participants are not assigned to groups at random. Instead, existing groups such as classes or schools participate in the experiments.

**Statistically significant** Not likely to be a chance occurrence.



What is a lie?—*What isn't true. What they say that they haven't done.*—Guess how old I am.—*Twenty.* No, I'm thirty.—Was that a lie you told me?—*I didn't do it on purpose.*—I know. But is it a lie all the same, or not?—*Yes, it is the same, because I didn't say how old you were.*—Is it a lie?—*Yes, because I didn't speak the truth.*—Ought you be punished?—*No.*—Was it naughty or not naughty?—*Not so naughty.*—Why?—*Because I spoke the truth afterwards!* (Piaget, 1965, p. 144)

Researchers also may employ case studies. A **case study** investigates one person or situation in depth. For example, Benjamin Bloom and his colleagues conducted in-depth studies of highly accomplished concert pianists, sculptors, Olympic swimmers, tennis players, mathematicians, and neurologists to try to understand what factors supported the development of outstanding talent. The researchers interviewed family members, teachers, friends, and coaches to build an extensive case study of each of these highly accomplished individuals (B. S. Bloom et al., 1985). Some educators recommend case study methods to identify students for gifted programs because the information gathered is richer than just test scores.

**Case study** Intensive study of one person or one situation.

**Ethnography** A descriptive approach to research that focuses on life within a group and tries to understand the meaning of events to the people involved.

**Participant observation** A method for conducting descriptive research in which the researcher becomes a participant in the situation in order to better understand life in that group.

**Microgenetic studies** Detailed observation and analysis of changes in a cognitive process as the process unfolds over a several-day or several-week period of time.

**Qualitative research** Exploratory research that attempts to understand the meaning of events to the participants involved using such methods as case studies, interviews, ethnography, participant observation, and other approaches that focus on a few people in depth.

**Quantitative research** Research that studies many participants in a more formal and controlled way using objective measures such as experimentation, statistical analyses, tests, and structured observations.

**ETHNOGRAPHY.** Ethnographic methods, borrowed from anthropology, involve studying the naturally occurring events in the life of a group to understand the meaning of these events to the people involved. In educational psychology research, ethnographies might study how students from different cultural groups are viewed by their peers or how teachers' beliefs about students' abilities affect classroom interactions. In some studies the researcher uses **participant observation**, actually participating in the group, to understand the actions from the perspectives of the people in the situation. Teachers can do their own informal ethnographies to understand life in their classrooms.

**THE ROLE OF TIME IN RESEARCH.** Many things that psychologists want to study, such as cognitive development (Chapter 2), happen over several months or years. Ideally, researchers would study the development by observing their subjects over many years as changes occur. These are called *longitudinal studies*. They are informative, but time-consuming, expensive, and not always practical: Keeping up with participants over a number of years as they grow up and move can be impossible. As a consequence, much research is *cross-sectional*, focusing on groups of students at different ages. For example, to study how children's conceptions of numbers change from ages 3 to 16, researchers can interview children of several different ages, rather than following the same children for 14 years.

Longitudinal studies and cross-sectional research examine change over long periods of time. The goal of **microgenetic studies** is to intensively study cognitive processes while the change is actually occurring. For example, researchers might analyze how children learn a particular strategy for adding two-digit numbers over the course of several weeks. The microgenetic approach has three basic characteristics: The researchers (a) observe the entire period of the change—from when it starts to the time it is relatively stable; (b) make many observations, often using video recordings, interviews, and transcriptions of the exact words of the individuals being studied; and (c) put the observed behavior “under a microscope,” that is, they examine it moment by moment or trial by trial. The goal is to explain the underlying mechanisms of change—for example, what new knowledge or skills are developing to allow change to take place. This kind of research is expensive and time-consuming, so often only one or two children are studied.

**WHAT'S THE EVIDENCE? QUANTITATIVE VERSUS QUALITATIVE RESEARCH.** There is a distinction you will encounter in your journey through educational psychology: the contrast between **qualitative research** and **quantitative research**. These are large categories, and like many categories, a bit fuzzy at the edges, but here are some simplified differences.

**Qualitative Research.** Case studies and ethnographies are examples of qualitative research. This type of research uses words, dialogue, events, themes, and images as data.

Interviews, observations, and analysis of transcripts are key procedures. The goal is to explore specific situations or people in depth and to understand the meaning of the events to the people involved in order to tell *their* story. Qualitative researchers assume that no process of understanding meaning can be completely objective. They are more interested in interpreting subjective, personal, or socially constructed meanings.

**Quantitative Research.** Both correlational and experimental types of research generally are quantitative because measurements are taken and computations are made. Quantitative research uses numbers, measurement, and statistics to assess levels or sizes of relationships among variables or differences between groups. Quantitative researchers try to be as objective as possible in order to remove their own biases from their results. One advantage of good quantitative research is that results from one study can be generalized or applied to other similar situations or people.

**MIXED METHODS RESEARCH.** Many researchers now are using *mixed methods* or *complementary methods* to study questions both broadly and deeply. These research designs are procedures for “collecting, analyzing, and ‘mixing’ both quantitative and qualitative methods in a single study or series of studies to understand a research problem” (Creswell, 2015, p. 537). There are three basic ways of combining methods. First, a researcher collects both quantitative and qualitative data at the same time, then merges and integrates the data in the analyses. In the second approach, the researcher collects quantitative data first, for example, from surveys or observation instruments, and then follows this by performing in-depth qualitative interviews of selected participants. Often the goal here is to explain or look for causes. Finally, the sequence can be reversed—the researcher first conducts interviews or case studies to identify research questions, then collects quantitative data as guided by the qualitative findings. Here the goal may be to explore a situation deeply (Creswell, 2015). Mixed methods research is becoming more common in educational psychology.

**SCIENTIFICALLY BASED RESEARCH AND EVIDENCE-BASED PRACTICES.** A requirement of the landmark 2002 NCLB Act was that educational programs and practices receiving federal money had to be consistent with “*scientifically based research*,” that is, rigorous systematic research that gathers valid and reliable data and analyzes those data with appropriate statistical methods. The 2015 Every Student Succeeds Act that replaced NCLB also requires “*evidence-based*” interventions in failing schools—strategies grounded in rigorous scientifically based research. For example, the U.S. Institute of Education Sciences (IES) provides a series of *Practice Guides* that contain recommendations from experts about various challenges educators face—guides to action based on strong evidence from research ([http://ies.ed.gov/ncee/wwc/Publications\\_Reviews.aspx](http://ies.ed.gov/ncee/wwc/Publications_Reviews.aspx)). In the upcoming chapters we will explore several of these guides, for example, *Organizing Instruction and Study to Improve Student Learning* in Chapter 8 (Pashler et al., 2007).

Scientifically based research and evidence-based practices fit the quantitative experimental approach described earlier better than qualitative methods such as ethnographic research or case studies, but there is continuing debate about what this means, as you will see in the *Point/Counterpoint* on the next page.

In the final analysis, the methods used—quantitative, qualitative, or a mixture of both—should fit the questions asked. Different approaches to research can ask different questions and provide different kinds of answers, as you can see in Table 1.3, on page 49.

**TEACHERS AS RESEARCHERS.** Research also can be a way to improve teaching in one classroom or one school. The same kind of careful observation, intervention, data gathering, and analysis that occurs in large research projects can be applied in any classroom to answer questions such as “Which writing prompts seem to encourage the most creative writing in my class?” “When does Kenyon seem to have the greatest difficulty concentrating on academic tasks?” “Would assigning task roles in science groups lead to more equitable participation of girls and boys in the work?” This kind of problem-solving

## POINT/COUNTERPOINT: What Kind of Research Should Guide Education?

During the past decade, policies in both health care and the treatment of psychological problems have emphasized evidence-based practices (McHugh & Barlow, 2010). Is this right for education?

**POINT** ▶ **Yes, research should be scientific; educational reforms should be based on solid evidence.** According to Robert Slavin (2002), tremendous progress has taken place in fields such as medicine, agriculture, transportation, and technology because these fields base their practices on scientific evidence. Randomized clinical trials and replicated experiments are the sources of the evidence:

These innovations have transformed the world. Yet education has failed to embrace this dynamic, and as a result, education moves from fad to fad. Educational practice does change over time, but the change process more resembles the pendulum swings of taste characteristic of art or fashion (think hemlines) rather than the progressive improvements characteristic of science and technology. (2002, p. 16)

In his Presidential Address to the First Conference of the International Mind, Brain, and Education Society, Kurt Fischer (2009, pp. 3–4) made a similar point:

What happened to education? If research produces useful knowledge for most of the industries and businesses of the world, then shouldn't it be serving the same function for education? Somehow education has been mostly exempt from this grounding in research. . . . There is no infrastructure in education that routinely studies learning and teaching to assess effectiveness. If Revlon and Toyota can spend millions on research to create better products, how can schools continue to use alleged "best practices" without collecting evidence about what really works?

An article in the *New York Times* suggests lack of evidence is still a problem.

Most [educational] programs that had been sold as effective had no good evidence behind them. And when rigorous studies were done, as many as 90 percent of programs that seemed promising in small, unscientific studies had no effect on achievement or actually made achievement scores worse (Kolata, 2013, p. 3).

**COUNTERPOINT** ▶ **Experiments and controlled studies are not the only or even the best source of evidence for education.** David Olson (2004) disagrees strongly with Slavin's position. He claims that we cannot use medicine as an analogy to education. "Treatments" in education are much more complex and unpredictable than administering one drug or another in medicine. And every educational program is changed by classroom conditions and the way it is implemented. Patti Lather, a colleague of mine at Ohio State, says, "In improving the quality of practice, complexity and the messiness of practice-in-context cannot be fantasized away. To try to do so yields impoverishment rather than improvement. That loss is being borne by the children, teachers, and administrators in our schools" (Lather, 2004, p. 30). David Berliner (2002) makes a similar point:

Doing science and implementing scientific findings are so difficult in education because humans in schools are embedded in complex and changing networks of social interaction. The participants in those networks have variable power to affect each other from day to day, and the ordinary events of life (a sick child, a messy divorce, . . . a birthday party, alcohol abuse, a new principal, a new child in the classroom, rain that keeps the children from a recess outside the school building) all affect doing science in school settings by limiting the generalizability of educational research findings. Compared to designing bridges and circuits or splitting either atoms or genes, the science to help change schools and classrooms is harder to do because context cannot be controlled. (p. 19)

Berliner concludes, "A single method is not what the government should be promoting for educational researchers" (Berliner, 2002, p. 20). Some current proponents of evidence-based interventions in education suggest that we benefit from the knowledge and wisdom of both practitioners and researchers. **Design-based research** does just that. Practitioners identify research questions based on problems of practice. Researchers then bring their time and talent to gather and analyze the data to address those problems (Scanlan, 2015).

**Beware Of Either/Or.** Complex problems in education require a whole range of methods for study as well as input from both researchers and educators. *Qualitative* research tells us specifically what happened in one or a few situations. Conclusions can be applied deeply, but only to the issue that was studied. *Quantitative* research can tell us what generally happens under certain conditions. Conclusions can be applied more broadly. Educators must help researchers target the most important problems that need evidence-based solutions.

TABLE 1.3 • What Can We Learn?

Different approaches to research can ask and answer different questions.

RESEARCH METHOD	PURPOSES/QUESTIONS ADDRESSED	EXAMPLE
Correlational	To assess the strength and direction of the relation between two variables; to make predictions.	Is the average amount of homework completed weekly related to student performance on unit tests? If so, is the relation positive or negative?
Experimental	To identify cause-and-effect relations; to test possible explanations for effects.	Will giving more homework cause students to learn more in science class?
ABAB Experiment	To identify the effects of a treatment or intervention for one or more individuals.	When students record the number of pages they read each night, will they read more pages? If they stop recording, will their amount of reading return to the previous levels?
Case Studies	To understand one or a few individuals or situations in depth.	How does one boy make the transition from a small rural elementary school to a large middle school? What are his main problems, concerns, issues, accomplishments, fears, supports, etc.?
Ethnography	To understand experiences from the participants' point of view: What is their meaning?	How do new teachers make sense of the norms, expectations, and culture of their new school, and how do they respond?
Mixed Methods	To ask complex questions involving causes, meanings, and relations among variables; to pursue both depth and breadth in research questions.	Based on a study of 20 classrooms using quantitative observational instruments, select the 5 classes with the fewest behavior problems and the 5 with the most problems late in the year. Next interview those teachers and their students and analyze videotapes made the first weeks of school to answer the question: Did the effective and ineffective teachers differ in how they established rules and procedures in their classes?

investigation is called **action research**. By focusing on a specific problem and making careful observations, teachers can learn a great deal about both their teaching and their students.

You can find reports of the findings from all types of studies in journals that are referenced in this book. For years I was editor of the *Theory Into Practice* journal ([tip.ehe.osu.edu](http://tip.ehe.osu.edu)). I think this is a terrific journal to inspire and guide action research in classrooms. For a great overview of the past 50 years in educational research and practice, see the Special 50th Anniversary issue of *Theory Into Practice* (Gaskill, 2013).

MyLab Education [Self-Check 1.3](#)

#### Design-based research

Practitioners identify research questions based on problems of practice, then researchers gather and analyze the data to address those problems.

#### Action research

Systematic observations or tests of methods conducted by teachers or schools to improve teaching and learning for their students.