EDUCATIONAL PSYCHOLOGY, 9/e, ACTIVE LEARNING EDITION

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Cluster I

Teachers, Teaching, and Educational Psychology

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Teachers' Casebook: What Would They Do? 17
If you are like many students, you 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 9th edition of *Educational Psychology* with questions such as these in mind.

In this first module, we begin with education—more specifically, with teaching today. 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? Only when you are aware of the challenges and possibilities of teaching and learning today can you 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?

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**Teachers’ Casebook**

**What Would You Do?**

It is your second year as a teacher at the Riverside Combined Campus (Kindergarten–8th grade). The district has just received money from the state and a private foundation to give three awards in your school for “excellence in teaching.” The principal wants the teachers’ recommendations about how to choose the recipients of these awards, so a committee is formed, composed of experienced teachers and one beginner—you. When the principal asked you to serve on the committee, you felt you had to say yes. All week the Teachers’ Lounge has been buzzing with discussion about the awards. Some teachers are suspicious—they fear the decisions will be purely political. Others are glad to see teaching honored. Names are mentioned as “sure winners” and a few teachers who seldom speak to you have become very friendly ever since the committee membership was announced. The first meeting is next week. How will you prepare for it?

**Critical Thinking**

What do you need to know about teaching to complete this task? What are some indicators of excellent teaching? Do different philosophies of teaching provide different answers to this question? What are your recommendations, and how would you back them up?

**Collaboration**

With 3 or 4 other members of your class, draw a concept map or web that graphically depicts “good teaching.” For an example of a concept map, see “Figure 21.2: Amy’s Molecule” in Module 21.
Before we consider what defines good teaching, let’s examine a more basic question: Does teaching really matter? For a while, some researchers reported findings suggesting 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 could you decide if teaching makes a difference? You could look to your own experience. Were there teachers who had an impact on your life? Describing teachers who made a difference for him, Harvard professor Robert Coles (1990) said:

I mention these teachers in my life because, in fact, they continue to be a great big part of it still. Their voices are in my head and are part of my voice, I am sure. Their thoughts and values inform what I consider and call my own thoughts and values. Their example—the things they did, the style of their teaching, the strategies they employed—continue to inform the way I work. (p. 59)

For Robert Coles, the teachers he has had continue to affect his life. But 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. Three studies speak to the power of teachers in the lives of students. The first followed 179 children from kindergarten through eighth grade. The second was a large-scale policy study of thousands of students and teachers in all 50 of the United States. The final study examined math achievement for students as they moved through 3rd, 4th, and 5th grades.

**Teacher-Student Relationships**

Bridgett Harme and Robert Pianta (2001) followed all the children in a small school district who entered kindergarten one year and continued in the school district through the 8th 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 8th grade, particularly for students with high levels of behavior problems. 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. The researchers concluded that “the association between the quality of early teacher-child relationships and later school performance can be both strong and persistent” (p. 636). Based on the results of this carefully conducted study, it appears that students with significant behavior problems in the early years are less likely to have prob-
lems later in school if their teachers are sensitive to their needs and provide frequent, consistent feedback. Read the Stories of Learning: Tributes to Teaching feature to put a face on the power of positive teacher-student relationships.

**Teacher Preparation and Quality**

Using data from a 50-state survey of policies, state case study analyses, the 1993–94 Schools and Staffing Surveys, and the National Assessment of Educational Progress (NAEP), Linda Darling-Hammond (2000) examined the ways in which teacher qualifications are related to student achievement across states. Her findings indicated that the quality of teachers—as measured by whether the teachers were fully certified and had a major in their teaching field—was related to student performance. In fact, measures of teacher preparation and certification were by far the strongest predictors of student achievement in reading and mathematics, both before and after controlling for student poverty and English language proficiency. For example, look at Table 1.1. All the correlations in the first row of this table are positive and significant. This means that the higher the percentage of teachers with full certification and a major in their teaching field, the higher is their students’ achievement in math and in reading. All but one of the correlations in the second row are negative and significant. This indicates that the higher the percentage of teachers who are teaching outside of their field, the lower is their students’ achievement. So there is evidence that more qualified teachers make a difference in student learning. (Later in the module we will look closely at how to interpret these statistics.)

Finally, researchers studied how students are affected by having several effective or ineffective teachers in a row (Sanders & Rivers, 1996). They looked at 5th graders in two large metropolitan school systems in Tennessee. Students who had highly effective teachers for 3rd, 4th, and 5th grades scored an average of 83rd percentile on a standardized mathematics achievement test in one district and 96th percentile in the other (99th percentile is the highest possible score). In contrast, students who had the least effective teachers three years in a row averaged 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 with average teachers or with a mixture of low, average, and high effectiveness teachers for the three 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 make up in part for less effective teaching in earlier grades, but could not erase all the deficits.

<table>
<thead>
<tr>
<th>Table 1.1</th>
<th>Correlations between Teacher Quality Variables and Student Achievement on the National Assessment of Educational Progress (controlling for student poverty).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of teachers well-qualified (with full certification and a major in their field)</td>
<td>.71**</td>
</tr>
<tr>
<td>Percent of teachers out of field (with less than a minor in the field they teach)</td>
<td>−.48*</td>
</tr>
</tbody>
</table>

* p < .05  
** p < .01

Well-qualified 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 what is good teaching? There are hundreds of answers to this question. It has been examined by educators, psychologists, philosophers, novelists, journalists, mathematicians, scientists, historians, policymakers, and parents, to name only a few groups. 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 Four Classrooms

To begin our examination of good teaching, let’s step inside the classrooms of several outstanding teachers. All the situations that follow are real. The first two teachers worked with my student teachers in local elementary schools. I have chosen them because one of my former colleagues at Rutgers, Carol Weinstein, has written about them in her book on classroom management (Weinstein & Mignano, 2003). The next two are secondary school teachers who have been studied by other educational psychologists.

A Bilingual 1st Grade. There are 25 students in Viviana’s class. Most 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 1st-grade curriculum for their district. She accomplishes this by teaching in Spanish early in the year to aid understanding, 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 while using every available opportunity to support their developing English proficiency.

Viviana’s expectations for her students are high, and she makes sure the students have the resources they need. She provides materials—pencils, scissors, crayons—so no child lacks the means to learn. And she supplies constant encouragement. “Viviana’s commitment to her students is evident in her 1st-grade bilingual classroom. With an energy level that is rare, she motivates, prods, instructs, models, praises, and captivates her students. . . . The pace is brisk and Viviana clearly has a flair for the dramatic; she uses music, props, gestures, facial expressions, and shifts in voice tone to communicate the material” (Weinstein & Mignano, 2003, p. 14). To know more about her students each year, she visits their homes. For Viviana, teaching is not just a job; it is a way of life.

A Suburban 5th Grade. Ken teaches 5th grade in a suburban elementary school in central New Jersey. 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 these 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. The study of science is also placed in the context of the real world. They learn about ocean ecosystems by using a software program called A Field Trip to the Sea (Sunburst, 1999). For social studies, the class plays two simulation games that focus on history. One is on coming of age in Native American cultures and the other is 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 dos 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.”

**Two Advanced Math Classes.** Hilda Borko and Carol Livingston (1989) describe two expert secondary school mathematics teachers. In one lesson for her advanced mathematics class, Ellen had her students identify any three problems about ellipses from their text. She asked if there were any questions or uncertainties about these problems. Ellen answered student questions, worked two of the problems, and then used the three problems to derive all the concepts and equations the students needed to understand the material. Ellen’s knowledge of both the subject and her students was so thorough that she could create the explanations and derive the formulas on the spot, no matter which problems the students chose.

Another teacher, Randy, worked with his students’ confusion to construct a review lesson about strategies for doing integrals. When one student said that a particular section in the book seemed “haphazard,” Randy led the class through a process of organizing the material. He asked the class for general statements about useful strategies for doing integrals. He clarified their suggestions, elaborated on some, and helped students improve others. He asked the students to tie their ideas to passages in the text. Even though he accepted all reasonable suggestions, he listed only the key strategies on the board. By the end of the period, the students had transformed the disorganized material from the book into an ordered and useful outline to guide their learning. They also had a better idea about how to read and understand difficult material.

What do you see in these classrooms? The teachers are committed to their students. They must deal with a wide range of student abilities and challenges: different languages, different home lives, different needs. These teachers must understand their subjects and their students’ thinking so well that they can spontaneously create new examples and explanations when students are confused. They must make the most abstract concepts, such as integrals, real and understandable for their particular students. And then there is the challenge of new technologies and techniques. The teachers must use them appropriately to accomplish important goals, not just to entertain the students. The whole time that 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 individuals 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 correct and collect homework, regroup students, give directions, distribute materials, collect lunch money, and deal with disruptions—and do all of this while also making a mental note to check why one of their students is so tired.

Viviana, Ken, Ellen, and Randy are examples of expert teachers, the focus of much recent research in education and psychology. For another perspective on the question “What is good teaching?” let’s examine this research on what expert teachers know.

**Expert Knowledge**

Expert teachers have elaborate systems of knowledge for understanding problems in teaching. For example, when a beginning teacher is confused with students’ wrong answers on math or history tests, all the wrong answers may seem about the same—wrong. But for an expert teacher, wrong answers are part of a rich system of knowledge that could include how to recognize several types of wrong answers, the misunderstanding or lack of information behind each kind of mistake, the best way to reteach and correct the misunderstanding, materials and activities that have worked in the past, and several ways to test whether the reteaching was successful (Floden & Klineking, 1990; Leinhardt, 1988). Peterson and Comeaux (1989) argue that it is the quality of teachers’ professional knowledge and their ability to be aware of their own thinking that make them expert. These teachers are reflective practitioners.
Expert teachers not only know the content of the subjects they teach, they also know how to relate this content to the world outside the classroom and how to keep students involved in learning.

What do expert teachers know that allows them to be so successful? Lee Shulman (1987) has studied this question, and he has identified seven areas of professional knowledge. Expert teachers know:

1. The academic subjects they teach.
2. General teaching strategies that apply in all subjects (such as the principles of classroom management, effective teaching, and evaluation that you will discover in this book).
3. The curriculum materials and programs appropriate for their subject and grade level.
4. Subject-specific knowledge for teaching: special ways of teaching certain students and particular concepts, such as the best ways to explain negative numbers to lower-ability students.
5. The characteristics and cultural backgrounds of learners.
6. The settings in which students learn—pairs, small groups, teams, classes, schools, and the community.
7. The goals and purposes of teaching.

This is quite a list. Obviously, one course cannot give you all the information you need to teach. In fact, a whole program of courses won’t make you an expert. That takes time and experience. But studying educational psychology can add to your professional knowledge because at the heart of educational psychology is a concern with learning wherever it occurs.

No person can learn for another; students create their own knowledge and skills. The teacher’s role is to orchestrate materials, tasks, environments, conversations, and explorations that encourage and support learning and the increasing independence of their students. To become such a teacher, you will need to know about your students, learning, motivating, teaching, and assessing. How do you grow from beginning teacher to expert? Can you learn to be an expert teacher, or are really great teachers just born? Is good teaching an art or a science? See the Point/Counterpoint for a closer look at this last question.

You may be thinking that all this talk about expert teachers and expert knowledge is a bit idealistic and abstract. Right now, you may have other, more down-to-earth, concerns about becoming a teacher. You are not alone!

**Beginning Teachers**

Imagine walking into your first day of teaching. List the concerns, fears, and worries you have. What assets do you bring to the job?

Beginning teachers everywhere share many concerns. A review of studies conducted around the world found that beginning teachers regard maintaining classroom discipline, motivating students, accommodating differences among students, evaluating student work, and dealing with parents as the most serious challenges they face. Many teachers also experience what has been called “reality shock” when they take their first job and confront the “harsh and rude reality of everyday classroom life” (Veenman, 1984, p. 143). One source of shock may be that teachers 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 the Stop/Think/Write box above, you shouldn’t be troubled. They come with the job of being a beginning teacher (Borko & Putnam, 1996; Cooke & Pang, 1991; Veenman, 1984).
What Is Good Teaching?

**Point**

*Teaching is a theory-based science.*

Psychologists have spent decades studying how children think and feel, how learning occurs, what influences motivation, and how teaching affects learning. These general and abstract conceptions apply to a wide range of situations—why should teachers have to reinvent all this knowledge? In Module 36 you will see one set of teacher characteristics and behaviors that are related to student learning: knowledge, clarity, enthusiasm, and direct or active teaching (Shuell, 1996). An effective teacher reviews, explains, checks for understanding, and reteaches if necessary, always keeping the level or difficulty and the pace just right to keep students learning. Advocates note that ignoring the direct teaching of skills can be detrimental for some children. For example, Harris and Graham (1996) describe the experiences of their daughter Leah in a whole-language/progressive education school, where the teachers successfully developed their daughter’s creativity, thinking, and understanding.

*Skills, on the other hand, have been a problem for our daughter and for other children. At the end of kindergarten, when she had not made much progress in reading, her teacher said she believed Leah had a perceptual problem or a learning disability. Leah began asking what was wrong with her, because other kids were reading and she wasn’t. Finally, an assessment was done.* (p. 26)

The testing indicated no learning disability, strong comprehension abilities, and poor word attack skills. Luckily, Leah’s parents knew how to teach word attack skills. Direct teaching of these skills helped Leah become an avid and able reader in about six weeks.

**Counterpoint**

*Teaching is an art—a creative reflective process.*

Other educators believe that the mark of an excellent teacher is not the ability to apply techniques but the artistry of being reflective—thoughtful and inventive—about teaching (Schon, 1983). Educators who adopt this view tend to be more concerned with how teachers plan, solve problems, create instruction, and make decisions than they are with the specific techniques teachers apply (Borko, 1989; Peterson & Comeaux, 1989). They believe teaching “is specific with respect to task, time, place, participants, and content, and that different subjects vary in those specifics” (Leinhardt, 2001, p. 334). Thus teaching is so complex that it must be invented anew with every new subject and class. And good teachers are not “sages on the stage,” spouting knowledge, but rather “guides by their students’ sides.” Critics of direct, teacher-centered teaching claim that breaking material into small segments, presenting each segment clearly, and reinforcing or correcting, is transmitting accurate understandings from teacher to student. The student is viewed as an “empty vessel” waiting to be filled with knowledge, rather than an active constructor of knowledge.

*Beware of either/or choices.*

Most people agree that teachers must be both technically competent and inventive. They must be able to use a range of strategies, and they must also be able to invent new strategies. They must have some simple routines for managing classes, but they must also be willing and able to break from the routine when the situation calls for change. And teachers need both general theories and situation-specific insights. They need “understandings of students in general—patterns common to particular ages, culture, social class, geography, and gender; patterns in typical student conceptions of the subject matter” (Ball, 1997, p. 773) and they also need to know their own students. “Face to face with actual children who are particular ages and gender, culture and class, teachers must see individuals against a backdrop of sociological and psychological generalizations about groups” (p. 773).

The theories you encounter in this text should be used as cognitive tools to help you examine, inspect, and interpret the claims you will hear and read throughout your career (Leinhardt, 2001).

Personally, I hope you all become teachers who both are “sages” about your subject and “on your students’ sides” wherever you stand.

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But even with these concerns, you don’t have to wait for years to become a good teacher. I have worked with many students who are excellent, even during their practice teaching experiences.
With experience, most teachers meet the challenges that seem difficult for beginners. They have more time to experiment with new methods or materials. Finally, as confidence grows, seasoned teachers can focus on the students’ needs. At this advanced stage, teachers judge their success by the successes of their students (Feiman-Nemser, 1983; Fuller, 1969; Putnam & Borko, 1997). Or as Esme’s mentor teacher once told her, “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).

I have talked about good teachers because that is what many of you are planning to become. But all good teaching begins with an understanding of students and learning—and an understanding of educational psychology.

The Role of Educational Psychology: Is It Just Common Sense?

For as long as educational psychology has existed—about 90 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 (Clifford, 1984; Grinder, 1981).

The view generally accepted today is that educational psychology is a distinct discipline with its own theories, research methods, problems, and techniques. “Educational psychology is distinct from other branches of psychology because it has the understanding and improvement of education as its primary goal” (Wittrock, 1992, p. 138). Both in the past and today, educational psychologists study learning and teaching and, at the same time, strive to improve educational practice (Pintrich, 2000). But 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.

In many cases, the principles set forth by educational psychologists—after spending much thought, time, and money—sound pathetically obvious. People are tempted to say, and usually do say, “Everyone knows that!” Consider these examples:
Taking Turns. What method should a teacher use in selecting students to participate in a primary grade reading class?

Common Sense Answer. Teachers should call on students randomly so that everyone will have to follow the lesson carefully. If a teacher were to use the same order every time, the students would know when their turn was coming up.

Answer Based on Research. Years ago, research by Ogden, Brophy, and Evertson (1977) found that the answer to this question is not so simple. In 1st-grade reading classes, for example, going around the circle in order and giving each child a chance to read led to better overall achievement than calling on students randomly. The critical factor in going around the circle may be that each child gets a chance to participate. Without some system for calling on everyone, many students can be overlooked or skipped. Research suggests there are better alternatives for teaching reading than going around the circle, but teachers should make sure that everyone has the chance for practice and feedback whatever approach is used (Tierney, Readence, & Dishner, 1990). See Module 36 for more on teaching reading.

Helping Students. When should teachers provide help for lower achieving students as they do class work?

Common Sense Answer. Teachers should offer help often. After all, these lower achieving students may not know when they need help or 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 helped student does not have the ability to succeed. The student is more likely to attribute failures to lack of ability instead of lack of effort. See Module 28 for more information on the unintended messages of well-intended teacher actions.

Skipping Grades. Should a school encourage exceptionally bright students to skip grades or to enter college early?
Common Sense Answer. No! Very intelligent students who are a year or two 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. According to Samuel Kirk and his colleagues (1993), “From early admissions to school to early admissions to college, research studies invariably report that children who have been accelerated have adjusted as well as or better than have children of similar ability who have not been accelerated” (p. 105). Whether acceleration is the best solution for a student depends on many specific individual characteristics, including the intelligence and maturity of the student, and on the other available options. For some students, moving quickly through the material and working in advanced courses with older students is a very good idea. See Module 11 for more on adapting teaching to students’ abilities.

Obvious Answers? Lily Wong (1987) demonstrated that just seeing research results in writing can make them seem obvious. She selected 12 findings from research on teaching; one of them was the “taking turns” result noted above. She presented six of the findings in their correct form and six in exactly the opposite form to college students and to experienced teachers. Both the college students and teachers rated about half of the wrong findings as “obviously” correct. In a follow-up study, another group of subjects was shown the 12 findings and their opposites and was asked to pick which ones were correct. For 8 of the 12 findings, the subjects chose the wrong result more often than the right one.

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 gifted 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 (Gage, 1991).

Using Research to Understand and Improve Teaching

Quickly, list all the different research methods you can name.

Conducting research to test possible relationships is one of two major tasks of educational psychology. The other is combining the results of various studies into theories that attempt to present a unified view of such things as teaching, learning, and development.

Descriptive Studies. Educational psychologists design and conduct many different kinds of research studies. Some of these are “descriptive,” that is, their purpose is simply to describe events in a particular class or several classes. Reports of descriptive studies often include survey results, interview responses, samples of actual classroom dialogue, or audio and video records of the class activities.

One descriptive approach, classroom ethnography, is borrowed from anthropology. Ethnographic methods involve studying the naturally occurring events in the life of a group and trying to understand the meaning of these events to the people involved. For example, the descriptions of expert high school mathematics teachers in
the opening pages of this module were taken from an ethnographic study by Borko and Livingston (1989). The researchers made detailed observations in the teachers’ classes and analyzed these observations, along with audio recordings and information from interviews with the teachers, in order to describe differences between novice and expert teachers.

In some descriptive studies the researcher uses participant observation and works within the class or school to understand the actions from the perspectives of the teacher and the students. Researchers also may employ case studies. A case study investigates in depth how a teacher plans courses, for example, or how a student tries to learn specific material.

Correlational Studies. Often the results of descriptive studies include reports of correlations. We will take a minute to examine this concept, because you need a knowledge of correlations to fully understand Table 1.1 and you will encounter many other correlations in the coming modules. 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 height and weight is about .70 (a strong relationship); the correlation between height 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. Height and weight are positively correlated because greater height tends to be associated with greater weight. As you saw in Table 1.1, the correlation between the percent of teachers with full teaching credentials and students’ math achievement is positive (as the percent of fully credentialed teachers increases, student math achievement increases as well). A negative correlation means that increases in one factor are related to decreases in the other. Table 1.1 indicated that as the number of teachers without either a major or a minor in math increases, student math achievement decreases.

It is important to note that correlations do not prove cause and effect (see Figure 1.1). Height and weight are correlated—taller people tend to weigh more than shorter people. 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 subjects are created. In psychological research, the term subjects generally refers to the people being studied—such as teachers or 8th graders—not to subjects such as math or science. One common way to make sure that groups of subjects are essentially the same is to assign each subject to a group using a random procedure. Random means each subject has an equal chance of being in any group.

In one or more of these groups, 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. Usually statistical tests are conducted. When differences are described as statistically significant, it means that they probably did not happen simply by chance. Look at Table 1.1 again. The $p < .05$ means that these results 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 teachers ignore students who are out of their seats without permission and praise students who are...
In many cases, both descriptive and experimental research occur together. The study about “taking turns” by Ogden, Brophy, and Evertson (1977) described at the beginning of this section is a good example. In order to answer questions about the relationship between how students are selected to read in a primary-grade class and their achievement in reading, these investigators first observed students and teachers in a number of classrooms and then measured the reading achievement of the students. They found that having students read in a predictable order was associated, or correlated, with gains in reading scores. With a simple correlation such as this, however, the researchers could not be sure that the strategy was actually causing the effect. In the second part of the study, Ogden and her colleagues asked several teachers to call on each student in turn. They then compared reading achievement in these groups with achievement in groups where teachers used other strategies. This second part of the research was thus an experimental study—specifically, a field experiment because it took place in a real classroom setting and not a laboratory.

**Single-Subject Experimental Designs.** The goal of single-subject experimental studies is to determine the effects of a therapy or teaching method, or other intervention. One common approach is to observe the individual for a baseline period (A) and assess the behavior of interest; try an intervention (B) and note the results; then remove the intervention and go back to baseline conditions (A); and finally reinstate the intervention (B). This form of single-subject design is called an ABAB experiment. For example, a teacher might record how many students are out of their seats without permission during a week-long baseline (A), and then try ignoring those who are up, but praising those who are seated and recording how many are wandering out of their seats for the week (B). Next, the teacher returns to baseline conditions (A) and records results, then reinstates the praise and ignore strategy (B). Years ago, when this very intervention was tested, the praise and ignore strategy proved effective in increasing the time students spent in their seats (Madsen, Becker, Thomas, Koser, & Plager, 1968).

**Microgenetic Studies.** The goal of microgenetic research is to intensively study cognitive processes in the midst of change—as the change is actually happening. 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: (a) researchers observe the entire period of the
change—from when it starts to the time it is relatively stable; (b) many observations
are made, often using videotape recordings, interviews, and transcriptions of the
exact words of the individuals being studied; (c) the behavior that is observed is "put
under a microscope," that is, examined moment by moment or trial by trial. The goal
is to explain the underlying mechanisms of change—for example, what new knowl-
dge or skills are developing to allow change to take place (Siegler & Crowley, 1991).
This kind of research is expensive and time consuming, so often only one or a few
children are studied.

The Role of Time in Research. Another distinction is useful in understanding
research—a distinction based on time. Many things that psychologists want to
study, such as cognitive development, 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 subjects
over years as they grow up and move can be impossible. So much research is cross-
sectional, focusing on groups of children at different ages. For example, to study
how children's conceptions of "alive" change from ages 3 to 16, researchers can inter-
view children of several different ages, rather than following the same children for
14 years.

Theories for Teaching. The major goal of educational psychology is under-
standing teaching and learning; research is a primary tool. Reaching this goal is a
slow process. There are very few landmark studies that answer a question once
and for all. Human beings are too complicated. Instead, research in educational
psychology examines limited aspects of a situation—perhaps a few variables at a
time or life in one or two classrooms. If enough studies are completed in a certain
area and findings repeatedly point to the same conclusions, we eventually arrive
at a principle. This is the term for an established relationship between two or
more factors—between a certain teaching strategy, for example, and student
achievement.

Another tool for building a better understanding of the teaching and learning
processes is theory. The common sense notion of theory (as in "Oh well, it was only
a theory") is "a guess or hunch." But the scientific meaning of theory is quite differ-
ent. "A theory in science is an interrelated set of concepts that is used to explain a
body of data and to make predictions about the results of future experiments"
(Stanovich, 1992, p. 21). Given a number of established principles, educational
psychologists have developed explanations for the relationships among many vari-
ables and even whole systems of relationships. There are theories to explain how
language develops, how differences in intelligence occur, and, as noted earlier, how
people learn.

Few theories explain and predict perfectly. In this book, you will see many ex-
amples of educational psychologists taking different theoretical positions and dis-
agreeing on the overall explanations of such issues as learning and motivation.
Because no one theory offers all the answers, it makes sense to consider what each has
to offer.

So why, you may ask, is it necessary to deal with theories? Why not just stick to
principles? The answer is that both are useful. Principles of classroom management,
for example, will give you help with specific problems. A good theory of classroom
management, on the other hand, will give you a new way of thinking about discipline
problems; it will give you tools for creating solutions to many different problems and
for predicting what might work in new situations. A major goal of this book is to

CONNECT & EXTEND

TO THE RESEARCH
process for personal theory building.
Educational Leadership, 48(6), 14–16.
Focus Question: Why do teachers need
a personal theory for teaching?

Principle Established relationship
between factors.
Theory Integrated statement of prin-
ciples that attempts to explain a phenom-
emon and make predictions.
provide you with the best and the most useful theories for teaching—those that have solid evidence behind them. Although you may prefer some theories over others, consider them all as ways of understanding the challenges teachers face.

**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 best descriptive 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 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.

**SUMMARY**

**What evidence is there that teachers make a difference?** Three studies speak to the power of teachers in the lives of students. The first found that the quality of the teacher-student relationship in kindergarten predicted several aspects of school success through the 8th grade. The second study of thousands of students and teachers in all 50 of the United States found that teacher quality was the strongest predictor of student achievement in mathematics and reading. The final study examined math achievement for students in two large school districts as they moved through 3rd, 4th, and 5th grades. Again, the quality of the teacher made a difference—students who had three high quality teachers in a row were way ahead of students who spent one or more years with less competent teachers.

**What do expert teachers know?** It takes time and experience to become an expert teacher. These teachers have a rich store of well-organized knowledge about the many specific situations of teaching. This includes knowledge about the subjects they teach, their students, general teaching strategies, subject-specific ways of teaching, settings for learning, curriculum materials, and the goals of education.

**What are the concerns of beginning teachers?** Learning to teach is a gradual process. The concerns and problems of teachers change as they progress. During the beginning years, attention tends to be focused on survival. Maintaining discipline, motivating students, evaluating students’ work, and dealing with parents are universal concerns for beginning teachers. Even with these concerns, many beginning teachers bring creativity and energy to their teaching and improve every year. The more experienced teacher can move on to concerns about professional growth and effectiveness with a wide range of students.

**What is educational psychology?** The goals of educational psychology are to understand and to improve the teaching and learning processes. Educational psychologists develop knowledge and methods; they also use the knowledge and methods of psychology and other related disciplines to study learning and teaching in everyday situations.

**Describe descriptive studies.** Reports of descriptive studies often include survey results, interview responses, samples of actual classroom dialogue, or records of the class activities. Ethnographic methods involve studying the naturally occurring events in the life of a group and trying to understand the meaning of these events to the people involved. A case study investigates in depth how a teacher plans courses, for example, or how a student tries to learn specific material.

**What are correlations and experimental studies?** Correlations allow you to predict events that are likely to occur in the classroom. A correlation is a number that indicates both the strength and the direction of a relationship between two events or measurements. The closer the correlation is to either 1.00 or –1.00, the stronger the relationship. Experimental studies can indicate cause-and-effect relationships and should help teachers implement useful changes. Instead of just observing and describing an existing situation, the investigators introduce changes and note the results.

**What are single-subject and microgenetic studies?** In single-subjective experimental designs, researchers examine the effects of treatments on one person, often by using a baseline/intervention/baseline/intervention or ABAAB approach. Microgenetic studies take many detailed observations of subjects to track the progression of change from the very beginning until a process becomes stable.

**Distinguish between principles and theories.** A principle is an established relationship between two or more factors—between a certain teaching strategy, for example, and student achievement. A theory is an interrelated set of concepts that is...
used to explain a body of data and to make predictions about the results of future experiments. The principles from research offer a number of possible answers to specific problems, and the theories offer perspectives for analyzing almost any situation that may arise.

**What is action research?** When teachers or schools make systematic observations or test out methods to improve teaching and learning for their students, they are conducting action research.

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Write the letter of the correct definition beside the word.

1. _______ Educational psychology  
2. _______ Action research  
3. _______ Positive correlation  
4. _______ Expert teachers  
5. _______ Descriptive studies  
   a. Reports a direct relationship between two variables  
   b. Observation and evaluation of teaching methodology intended to improve the learning for all students  
   c. Has the primary goal to understand and improve education  
   d. Intends to collect extensive information about specific situations, using observation, surveys, recordings, or a combination of these methods  
   e. Possess extensive knowledge of the teaching process and develop solutions for common classroom problems  

6. Harme and Pianta (2001) found a positive correlation between the quality of early teacher-child relationships and later school performance. What type of research was most likely used to collect the data for this study?  
   a. Descriptive studies  
   b. Single subject experimentation studies  
   c. Experimentation  
   d. None of the above  

7. Darling-Hammond (2000) concluded “the higher the percentage of teachers with full certification and a major in their teaching field, the higher is their students’ achievement in math and science.” This finding represents a:  
   a. Reflective statement  
   b. Negative correlation  
   c. Positive correlation  
   d. Case study  

8. Good teaching must include a:  
   a. Commitment to students  
   b. Understanding of subjects and students’ thinking  
   c. Ability to make abstract concepts understandable  
   d. Caring nature willing to understand the emotional needs of students  
   e. All of the above  

9. Peterson and Comeaux (1989) argue the quality of teachers’ professional knowledge and their ability to be aware of their own thinking makes them experts. One of the essential tasks for “professional teachers” committed to growing into experts is to:  
   a. Rely on personal experiences as the primary means to grow and shape teaching practices  
   b. Maintain consistent content and pedagogy practices from year to year  
   c. Use research to understand and improve teaching  
   d. View expert teaching as a rigid and fixed practice. Teachers should not reinvent knowledge supported by past research  

10. According to Woolfolk (2003), what do beginning teachers report as the most serious challenge they face?  
    a. Maintaining classroom discipline  
    b. Motivating students  
    c. Accommodating differences among the students  
    d. Dealing with parents  
    e. All of the above  

**REFLECT**  
Do you believe that teachers make a difference?  
What examples from your own education might support that view?
Here is how some practicing teachers responded to the teaching situation presented at the beginning of this cluster about establishing a “Teaching Excellence Award.”

Madya Ayala  
High School Teacher of Preparatoria Eugenio Garza Lagüera, Campus Garza Sada, Monterrey, N.L. Mexico

The first thing that I would propose is to establish a set of selection criteria. We know that all teachers have strengths and weaknesses and what works the best for each of us. The set of evaluation criteria could change from time to time depending on international, national, and local needs and values. These factors would influence the interpretation of a teacher’s psychological, pedagogical, and epistemological strengths as well.

Length of experience should not be a factor, only excellence in performance as a teacher. The main objective should be to make teachers aware of what is expected of them and to set the best examples.

Katie Churchill  
Third Grade Teacher, Oriole Parke Elementary School, Chicago, Illinois

I would prepare for the meeting by researching how other schools have chosen recipients for similar awards in the past. I would recommend that we select different categories of “excellence” to decide who will be nominated for the awards. I would suggest that we choose recipients fairly, based on their teaching abilities. Finally, I would recommend that we have student input regarding which teachers should receive these awards.

Carey Perkson  
Second Grade Teacher, Brown School, Natick, Massachusetts

I would have a discussion with the experienced teachers before our committee meeting to pinpoint what qualifications we are looking for in our candidates. Establishing a definition of “excellence in teaching” and constructing a list of recommendations should be a priority of the committee to ensure that all committee members are looking for the same qualifications. By constructing a list of key qualities and accomplishments for each nominee, we would be able to assess who would be the most qualified for the award.

Denise Ready  
Second Grade Teacher, Snug Harbor Community School, Quincy, Massachusetts

My preparation for this meeting would be to come up with the following list of what I believe are indicators of excellent teaching. An excellent teacher:

- Loves children.
- Respects all children and parents under all circumstances.
- Sees potential in all children.
- Motivates students to reach their highest potential.
- Is a spontaneous and creative educator who is able to see a teachable moment and seize the opportunity to go with it.
- Has a sense of humor.

Aimee Fredette  
Second Grade Teacher, Fisher Elementary School, Walpole, Massachusetts

There are many facets to being an effective teacher, the foremost being that the teacher will reach all children no matter what it takes. Effective teachers will modify curriculum and instruction to allow all ability levels to feel success and to foster a learning environment that builds the self-esteem of their students. This environment and confidence will encourage children to succeed at their own attempts to learn.

Effective teachers, regardless of philosophy, will excite and spark the children’s interest. This will help the children to develop their own motivation for learning. I also feel that teachers should fully support the placement of all children into their classroom, regardless of abilities. To be effective, teachers will appropriately modify and implement assignments to meet those levels. A positive learning experience is created with a cooperative relationship among teachers, students, and home.

Go to the Companion Website (www.ablongman.com/woolfolk) for additional case studies including audio and video cases, and examples of student work.