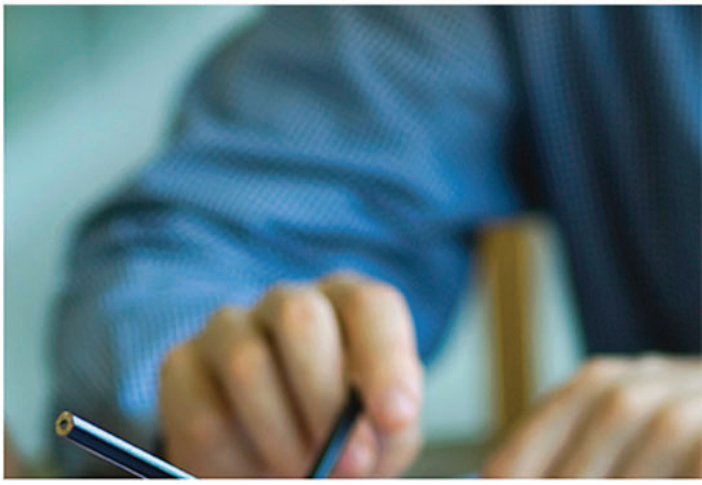
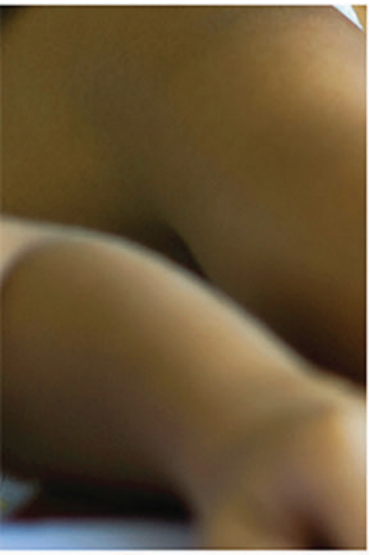
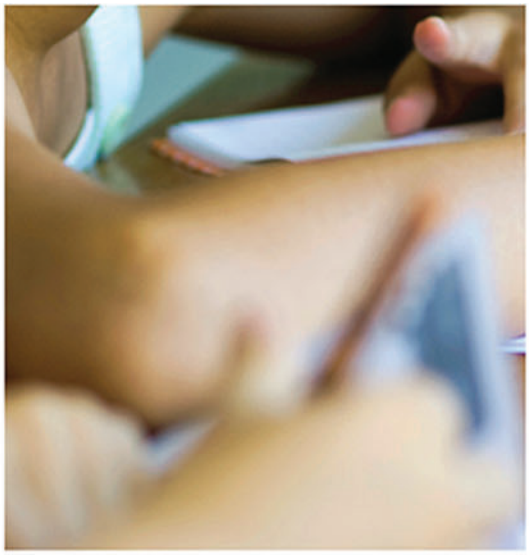
# EDUCATIONAL PSYCHOLOGY

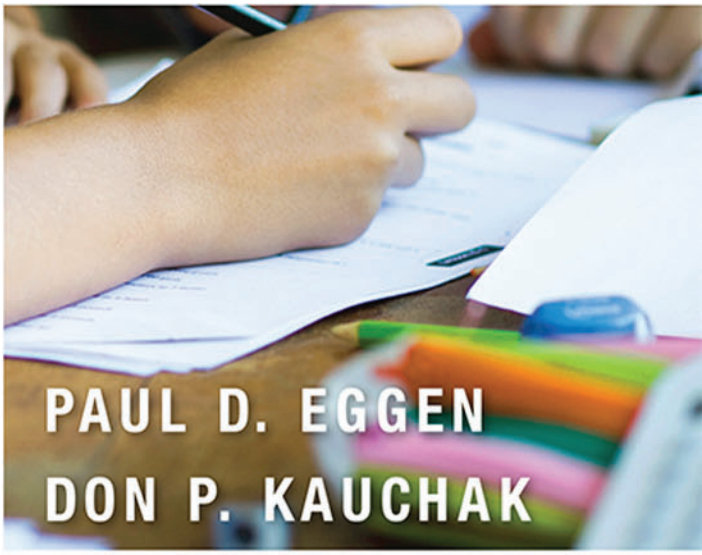
## WINDOWS ON CLASSROOMS

edition 10









PAUL D. EGGEN
DON P. KAUCHAK

# Educational Psychology

## Windows on Classrooms

Tenth Edition

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University of Utah

PEARSON

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**Library of Congress Cataloging-in-Publication Data:**
Eggen, Paul D.,
Educational psychology : windows on classrooms/Paul Eggen, University of North Florida, Don Kauchak, University of Utah. — Tenth edition.
pages cm
ISBN 978-0-13-354948-5—ISBN 0-13-354948-8
1. Educational psychology—Study and teaching (Higher)—United States. 2. Learning, Psychology of—Case studies. I. Kauchak, Donald P., II. Title.
LB1051.E463 2016
370.15—dc23

2014034505

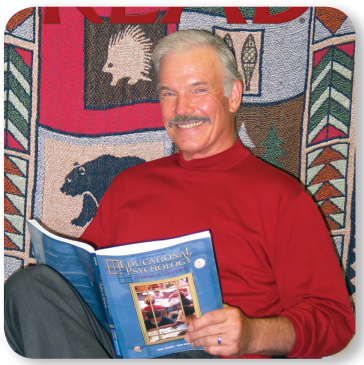
10 9 8 7 6 5 4 3 2 1

PEARSON

ISBN 10: 0-13-354948-8
ISBN 13: 978-0-13-354948-5

To Judy and Kathy,
teachers who have changed many lives.

# About the Authors



## Paul Eggen

Paul has worked in higher education for nearly 40 years. He is a consultant for public schools and colleges in his university service area and has provided support to teachers in 12 states. Paul has also worked with teachers in international schools in 23 countries in Africa, South Asia, the Middle East, Central America, South America, and Europe. He has published several articles in national journals, is the co-author or co-editor of six other books, and presents regularly at national and international conferences.

Paul is strongly committed to public education. His wife is a middle school teacher in a public school, and his two children are graduates of public schools and state universities.

## Don Kauchak

Don has taught and worked in schools and in higher education in nine states for over 40 years. He has published in a number of scholarly journals, including the *Journal of Educational Research, Journal of Experimental Education, Journal of Research in Science Teaching, Teaching and Teacher Education, Phi Delta Kappan,* and *Educational Leadership.* In addition to this text, he has co-authored or co-edited six other books on education. He has also been a principal investigator on federal and state grants examining teacher development and evaluation practices, and presents regularly at the American Educational Research Association. He currently volunteer-tutors first, second, and third graders in a local elementary school. These students have taught him a lot about educational psychology.

# Preface

Welcome to the tenth edition of *Educational Psychology: Windows on Classrooms*. We have redoubled our efforts to make this edition the clearest, most comprehensive, and up-to-date presentation of theory and research, combined with the most specific and usable applications, of any text in the field. Our text is generally recognized as the most applied in educational psychology, and in this edition we've tried to achieve the optimal balance of theory, research, and application.

To meet this goal we have much that is new to this edition. We outline these changes in the sections that follow.

## Content New to This Edition

To provide students with the most complete and up-to-date information on recent developments in educational psychology, we have included the following new content in our tenth edition.

- *Major reorganization of the learning section of the book—Chapters 6–9:* Learning is at the heart of educational psychology, and we've reorganized these chapters to reflect recent developments in our understanding of how students in classrooms, and people of all ages, learn.
- *Analyzing Theories:* Research in every field is grounded in theory, but all theories have both strengths and weaknesses. "Analyzing Theories," a new feature in this edition, analyzes all the major theories discussed in the text. For instance, Piaget's and Vygotsky's theories of cognitive development are analyzed in Chapter 2, behaviorism and social cognitive theory are analyzed in Chapter 6, and constructivism is analyzed in Chapter 9. This analysis includes a summary of the major concepts within each theory, together with the contributions the theories make to our understanding of teaching and learning and common criticisms directed at each. We believe the addition of this feature will provide students with a more complete and accurate view of the theoretical foundation of educational psychology.
- *New chapter—Knowledge Construction in Social Contexts:* Educational psychology generally accepts the idea that learners construct their own knowledge and that learning is substantively a social process. This new chapter reflects and integrates these ideas in a comprehensive presentation that explains how these powerful ideas influence teaching and learning.
- *Extensive coverage of the learning sciences:* The learning sciences focus on learning as it exists in real-world settings and how teachers can facilitate that learning. This is the essential message of our text, and this new content explains how to apply these ideas to increase learning for all students.
- *Expanded coverage of technology's impact on learning:* To say that technology is an integral part of our lives is a vast understatement. Expanded coverage of technology throughout the text examines how it influences learning, development, and motivation, in addition to the general impact it is having on the way we live.
- *Greatly expanded coverage of neuroscience:* Neuroscience is providing researchers, educational leaders, teachers, and students with new insights into the teaching–learning process. As one powerful example, the concept of *neuroplasticity* helps us understand that our learning potential is much greater than we once believed possible, and with the right kinds of experiences, we can literally get smarter. This

expanded coverage helps teachers capitalize on this information to increase learning for all students regardless of their backgrounds.

- *Extensive coverage of the role of personality and emotion on learning and development:* Learning and development consist of much more than cognitive processes alone; personality and emotion play an important role in our motivation and how effectively we learn and develop. Further, both home and school environments have an important impact on the healthy development of learners' personalities and emotions. This coverage helps teachers create the kinds of environments that capitalize on these insights.
- *Updated descriptions of standards, accountability, and value-added teacher assessment and how they impact teaching and learning:* Standards—including the Common Core State Standards—combined with accountability, are facts of teaching life, and our discussion of these topics in this edition, including the controversies involved with each, is designed to prepare teachers to adapt to this new reality.

This new content adds to our expanded and detailed descriptions of traditional theories combined with the latest research. Our goal is to make the content presented in this text the most comprehensive and up-to-date discussion of learning, development, motivation, instruction and classroom management, classroom and standardized assessment, and learner diversity of any text in the field.

## Applications New to This Edition

The content of educational psychology isn't useful if teachers don't know how to apply it to increase their students' learning and shape their development. To prepare teachers for the real world, and to help all students understand how educational psychology applies to their lives today, we have again redoubled our efforts to improve what is already the most applied educational psychology text in the field.

The following applications are new to this edition:

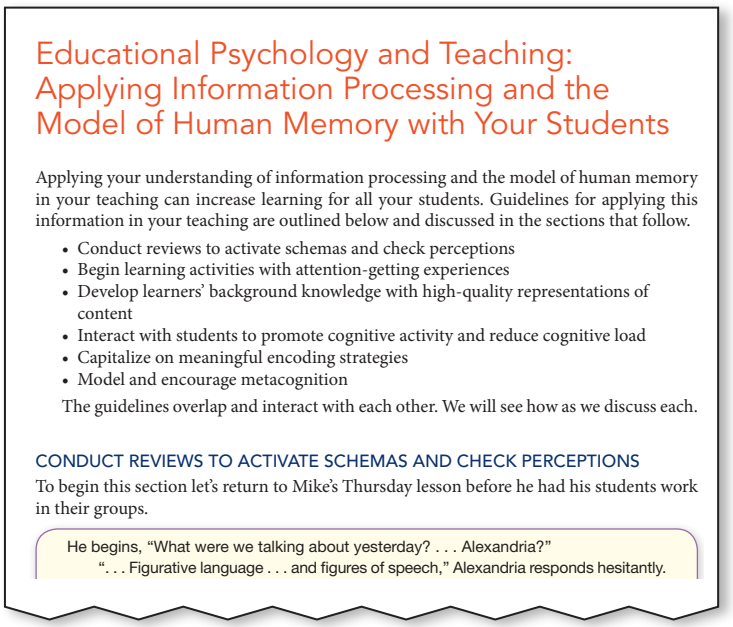
- *Explicit suggestions for applying educational psychology in teaching:* Instructors often tell us that their students can describe the theories and research that make up educational psychology, but these same students "don't know what to do with the content" when they go out into the real world of teaching. We attempt to solve this problem in this edition. Each chapter now includes specific sections titled "Educational Psychology and Teaching," which provide teachers with specific and concrete suggestions for applying the content of each chapter in their teaching. For instance, in Chapter 2, "Educational Psychology and Teaching: Applying Piaget's Theory with Your Students" provides teachers with specific suggestions for using Piaget's theory to advance their students' development, and a similar section does the same with Vygotsky's theory. As another example, in Chapter 4, "Educational Psychology and Teaching: Teaching Students in Your Classes Who Are Culturally and Linguistically Diverse" provides specific suggestions for accommodating and capitalizing on the diversity that our students are increasingly bringing to our classes. These suggestions are combined with concrete illustrations of teachers in the real world demonstrating these applications. "Educational Psychology and Teaching" sections are included in every chapter in the text.
- *Case studies linked to standards*: Standards have become a part of teachers' lives in today's classrooms. Case studies that introduce each chapter in the book are now linked to standards so prospective teachers can now see how their colleagues in the real world have adjusted to this new reality and have incorporated standards into their instruction.

- *Case studies in both written and video formats:* In the etext version of this edition, students can read case studies embedded in the text and can now see in video form the very lesson on which the case study is based. So they can read the case studies, and then with a simple click of their mouse see the actual lesson and how the teacher in the lesson applies the content of educational psychology to the real world of classrooms. No other text in the field applies the content of educational psychology to classrooms in this way.
- *Ed Psych and You:* This feature, which first appeared in our ninth edition, has been expanded to help students see that educational psychology applies not only to teaching but also to our lives as we live them every day. This feature is also designed to make the content of educational psychology more meaningful to students who may not plan to be teachers.

These new applications, combined with other features such as "Classroom Connections" and "Developmentally Appropriate Practice," make this edition even more usable in the real world of teaching. Further, we would like to believe that the text can be a resource for both new and veteran teachers as they move through their careers.

## The Most Applied Educational Psychology Book in the Field

This is the most applied text in the field. The following illustrate these applications.



### Educational Psychology and Teaching: Applying Information Processing and the Model of Human Memory with Your Students

Applying your understanding of information processing and the model of human memory in your teaching can increase learning for all your students. Guidelines for applying this information in your teaching are outlined below and discussed in the sections that follow.

- Conduct reviews to activate schemas and check perceptions
- Begin learning activities with attention-getting experiences
- Develop learners' background knowledge with high-quality representations of content
- Interact with students to promote cognitive activity and reduce cognitive load
- Capitalize on meaningful encoding strategies
- Model and encourage metacognition

The guidelines overlap and interact with each other. We will see how as we discuss each.

#### CONDUCT REVIEWS TO ACTIVATE SCHEMAS AND CHECK PERCEPTIONS

To begin this section let's return to Mike's Thursday lesson before he had his students work in their groups.

He begins, "What were we talking about yesterday? . . . Alexandria?"
". . . Figurative language . . . and figures of speech," Alexandria responds hesitantly.

**Explicit Suggestions for Applying Educational Psychology in Teaching**. "Educational Psychology and Teaching," which appears in every chapter, provides teachers with specific suggestions for applying the content of educational psychology to increase learning for all their students. The excerpt you see here appears on page 300 of Chapter 7 in the text.

**Ed Psych and You.** This feature helps students see how educational psychology applies to our lives and the people around us. The example you see here appears on page 46 in Chapter 2 of the text.

### Ed Psych and You

Are you bothered when something doesn't make sense? Do you want, and even expect, the world to be predictable? Are you more comfortable in classes where the instructor specifies the requirements, outlines the grading practices, and consistently follows through? For most people, the answer to these questions is "Yes." Why do you think this is the case?

The students in this case are third graders, and their teacher, Alicia Evans, is working with them on *Common Core State Standard* ***CCSS.ELA-Literacy.L.3.1f "Ensure subject-verb and pronoun-antecedent agreement"*** (Common Core State Standards Initiative, 2014f).

After completing her routines for the beginning of language arts, Alicia explains and demonstrates the rules with some examples on the board. She then displays the following short paragraph on her document camera.

Bill takes his lunch to the cafeteria when it's time to eat. His friend Leroy and his other friend Antonio (takes, take) (his, theirs) to the cafeteria, too. Each of the boys has (his, their) own lunch box with pictures of cars on (it, them). Bill doesn't like apples, so he will give his to anyone else if (he, they) (wants, want) it.

"Now," she directs, "Read the paragraph carefully, . . . think about it, and then decide which one of the words in the parentheses in each case is correct. Remember, our reasons and thinking are as important as the actual answers."

After giving the students a couple minutes to study the paragraph, she begins, "How about the first one?" pointing to the first set of parentheses (takes, take) in the paragraph.

The students conclude that "take" is correct in the sentence because "Leroy and Antonio" is a plural subject, so it requires the plural verb "take." They also conclude that "theirs" is correct in the sentence because "theirs" agrees with its antecedent (Leroy and Antonio).

"Now, how about this one?" she asks, pointing to the next set of parentheses (his, their) in the third sentence—Each of the boys has (his, their) own lunch box with pictures of cars on (it, them). "What do you think, and why do you think so . . . Brittany?"

**Case Studies Linked to Standards.** The case studies that appear in this edition are now linked to standards. The excerpt you see here appears on page 359-360 in Chapter 9 of the text.

**Classroom Connections at Elementary, Middle School, and High School Levels.** These features in each chapter offer suggestions and illustrations for applying topics discussed in the chapter at different grade levels. Each strategy is illustrated with a classroom example, derived from teachers' experiences in elementary, middle, and high schools. The example you see here appears on page 407 of Chapter 10 of the text.

## Classroom Connections

### Capitalizing on Students' Needs to Increase Motivation in Classrooms

#### Maslow's Hierarchy of Needs

1. Maslow described people's needs in a hierarchy with deficiency needs—survival, safety, belonging, and self-esteem—preceding the growth needs. Address students' deficiency and growth needs both in instruction and in the way you interact with students.
   - **Elementary:** A fourth-grade teacher calls on all students to involve everyone and promote a sense of belonging in his classroom. He makes them feel safe by helping them respond correctly when they are unable to answer.
   - **Middle School:** To help meet learners' belonging needs, a seventh-grade teacher asks two of the more popular girls in her class to introduce a new girl to other students and to take her under their wings until she gets acquainted.
   - **High School:** To address learners' growth needs, an American government teacher brings in a newspaper columnist's political opinion piece, comments that it was interesting to her, and asks students for their opinions on the issue.

#### Learners' Needs for Self-Determination

2. Self-determination theory suggests that people have innate needs for competence, autonomy, and relatedness. Design challenging learning tasks that, when completed, can provide evidence for increasing competence, and emphasize these accomplishments when students succeed.
   - **Elementary:** A fifth-grade teacher drops an ice cube into a cup of water and a second cube into a cup of alcohol and asks them why it floats in one and sinks in the other. He guides students' efforts until they solve the problem and then praises them for their thinking.
   - **Middle School:** A math teacher has students bring in a challenging "problem of the week." He helps them solve each problem and comments on how much their problem solving is improving.
   - **High School:** A biology teacher guides a discussion of our skeletal system until students understand the function of the skull, rib cage, and other bones, and then comments on how good the students are getting at analyzing our body systems.
3. Learners' perceptions of autonomy increase when teachers ask them for input into classroom procedures, involve them in learning activities, and give them feedback on assessments. Create a classroom environment that helps meet learners' needs for autonomy.
   - **Elementary:** A fourth-grade teacher holds periodic class meetings in which she encourages students to offer suggestions for improving the classroom environment.
   - **Middle School:** A prealgebra teacher returns all tests and quizzes the following day and discusses frequently missed problems in detail. He comments frequently on students' continually improving skills.
   - **High School:** In a simulation, a world history teacher asks students to identify specific archeological evidence for sites that represent different civilizations. She comments that the students' ability to link evidence to conclusions has improved significantly.
4. Learners' needs for relatedness are met when teachers communicate a commitment to students both as people and as learners.
   - **Elementary:** A first-grade teacher greets her students each morning at the door with a hug, "high five," or handshake. She tells them what a good day they're going to have.
   - **Middle School:** A seventh-grade teacher calls a parent to express concern about a student whose behavior and attitude seems to have changed.
   - **High School:** A geometry teacher in an urban school conducts help sessions after school on Mondays through Thursdays. When they come in for extra help, she also encourages students to talk about their personal lives and their hopes for the future.

#### Learners' Needs to Preserve Self-Worth

5. Self-worth theory suggests that people link self-worth to high ability. Emphasize that ability can be increased with effort.
   - **Elementary:** When her second graders succeed with word problems during their seatwork, a teacher comments, "You're really understanding what we're doing. The harder we work, the smarter we get."
   - **Middle School:** A life-science teacher comments, "You're really seeing the connections between animals' body structures and their ability to adapt. This is not an easy idea to grasp and you should feel good about figuring this out.
   - **High School:** As students' understanding of balancing equations increases, a chemistry teacher comments, "Balancing equations is important in chemistry and I know it isn't easy, but you people are really getting good at this stuff."

**Developmentally Appropriate Practice.** These features in each chapter describe developmental differences in our students and help teachers ensure that their instruction will best meet the needs of learners at all developmental levels. The example you see here appears on page 126 of Chapter 3 in the text.

## Developmentally Appropriate Practice

### Personal, Social, and Moral Development with Learners at Different Ages

Important differences exist in the personal, emotional social, and moral development of elementary, middle, and high school students. The following paragraphs outline suggestions that will help you respond to these differences.

#### Working with Students in Preschool Programs and Elementary Schools

As children enter preschool, they are developing autonomy and taking the initiative to seek out experiences and challenges. "Let me help!" and "I want to do it" are signs of this initiative. Criticism or overly restrictive directions detract from a sense of independence and, in extreme cases, lead to feelings of guilt and dependency. At the same time, children need the structure that helps them learn to take responsibility for their own behavior.

As children move through the elementary years, teachers attempt to help them succeed in learning activities challenging enough to promote feelings of competence and industry. This is demanding. Activities that are so challenging that students frequently fail can leave them with a sense of inferiority, but success on trivial tasks does little to make students feel competent (Brophy, 2010).

During the elementary years, students need opportunities to practice perspective taking and social problem solving. Discussions and small-group work where students can interact with others and practice these skills are effective learning experiences.

The elementary grades also lay the foundation for students' moral growth and the development of social responsibility and self-control. Teachers who encourage students to understand the impact of their actions on others help them make the transition from preconventional morality, with its egocentric orientation, to conventional morality, at which stage students understand why rules are important for both classrooms and the world outside of school.

#### Working with Students in Middle Schools

Adolescence is a time of considerable physical, emotional, and intellectual changes, and adolescents are often uncertain about how to respond to new sexual feelings. They are concerned with what others think of them and are preoccupied with their looks. They want to assert their independence, yet long for the stability of structure and discipline. They want to rebel to assert their independence but need something solid to rebel against.

Most adolescents successfully negotiate this period, however, exploring different roles and maintaining positive relationships with their parents, teachers, and other adults. Students in middle and junior high schools need firm, caring teachers who empathize with them and their sometimes capricious actions while simultaneously providing the security of clear limits for acceptable behavior (Emmer & Evertson, 2013). Classroom management provides opportunities to advance moral reasoning from preconventional to conventional thinking. Effective teachers create clear classroom rules, discuss the reasons for them, and enforce them consistently.

Instruction in middle school classrooms should promote deep understanding of the topics being studied, while simultaneously providing students with opportunities to practice prosocial behaviors, such as tolerance for others' opinions, listening politely, and avoiding hurtful comments. Effective instruction in middle schools is highly interactive, and lecture is held to a minimum.

#### Working with Students in High Schools

High school students are continuing to wrestle with who they are and what they want to become. Peers become increasingly important to students and have an important influence on social, emotional, and moral development.

Linking content to students' lives is particularly valuable at this age. For example, examining ideas about gender and occupational trends in social studies and showing how math and science can influence their futures are important for these students.

Like younger learners, high school students need opportunities to try out new ideas and link them to their developing sense of self. Discussions, small-group work, and focused writing assignments provide valuable opportunities for students to integrate new ideas into their developing self-identities.

# Supplementary Materials

This edition of *Educational Psychology: Windows on Classrooms* provides a comprehensive and integrated collection of supplements to assist students and professors in maximizing learning and instruction. The following resources are available for instructors to download from **www.pearsonhighered.com/educator.** Enter the author, title of the text, or the ISBN number, then select this text, and click on the "Resources" tab. Download the supplement you need. If you require assistance in downloading any resources, contact your Pearson representative.

## Instructor's Resource Manual

The Instructor's Resource Manual includes chapter overviews and outcomes, lists of available PowerPoint® slides, presentation outlines, teaching suggestions for each chapter, and questions for discussion and analysis along with feedback.

## Powerpoint® Slides

The PowerPoint® slides highlight key concepts and summarize text content. The slides also include questions and problems designed to stimulate discussion, encourage students to elaborate and deepen their understanding of the topics in each chapter, and apply the content of the chapter to both the real world of teaching and their daily lives. The slides are further designed to help instructors structure the content of each chapter to make it as meaningful as possible for students.

## Test Bank

The Test Bank provides a comprehensive and flexible assessment package. The Test Bank for this edition has been revised and expanded to make it more applicable to students. To provide complete coverage of the content in each chapter, all multiple-choice and essay items are grouped under the chapters' main headings and are balanced between knowledge/recall items and those that require analysis and application.

## TestGen®

TestGen is a powerful test generator available exclusively from Pearson Education publishers. You install TestGen on your personal computer (Windows or Macintosh) and create your own tests for classroom testing and for other specialized delivery options, such as over a local area network or on the web. A test bank, which is also called a Test Item File (TIF), typically contains a large set of test items, organized by chapter and ready for your use in creating a test, based on the associated textbook material. Assessments may be created for both print and testing online. The tests can be downloaded in the following formats:

TestGen Testbank file—PC
TestGen Testbank file—MAC
TestGen Testbank—Blackboard 9 TIF
TestGen Testbank—Blackboard CE/Vista (WebCT) TIF
Angel Test Bank (zip)
D2L Test Bank (zip)
Moodle Test Bank
Sakai Test Bank (zip)

# Acknowledgments

Every book reflects the work of a team that includes the authors, the staff of editors, and the reviewers. We appreciate the input we've received from professors and students who have used previous editions of the book, and we gratefully acknowledge the contributions of the reviewers who offered us constructive feedback to guide us in this new edition:

Elizabeth Levine Brown, George Mason University; Jeffrey Liew, Texas A&M University; Serena Shim, Ball State University; Douglas W. Smith, Coastal Carolina University; and Rayne A. Sperling, Penn State University.

In addition, we acknowledge, with our thanks, the reviewers of our previous editions:

Patricia Barbetta, Florida International University; David Bergin, University of Toledo; Scott W. Brown, University of Connecticut; Kay S. Bull, Oklahoma State University; Barbara Collamer, Western Washington University; Jerome D'Agostino, University of Arizona; Betty M. Davenport, Campbell University; Brenda M. Davis, Randolph-Macon College; Ronna F. Dillon, Southern Illinois University; Oliver W. Edwards, University of Central Florida; Thomas G. Fetsco, Northern Arizona University; Leena Furtado, California State University, Dominguez Hills; Newell T. Gill, Florida Atlantic University; Claire Gonzalez, University of North Florida; Charles W. Good, West Chester University; Amy Hogan, Ottawa University; Robert L. Hohn, University of Kansas; Joel B. Judd, Adams State College; Pamela K. Kidder, Fort Valley State University; Dov Liberman, University of Houston; Hermine H. Marshall, San Francisco State University; Tes Mehring, Emporia State University; Luanna H. Meyer, Massey University–New Zealand; Michelle Morris, Northwestern State University; Nancy Perry, University of British Columbia; Evan Powell, University of Georgia; Anne N. Rinn, Western Kentucky University; Jay Samuels, University of Minnesota; Gregory Schraw, University of Nebraska, Lincoln; Dale H. Schunk, Purdue University; James A. Shuff, Henderson State University; Rozanne Sparks, Pittsburgh State University; Robert J. Stevens, Pennsylvania State University; Julianne C. Turner, Notre Dame University; Nancy Vye, University of Washington; Steven Whitney, University of Missouri; Glenda Wilkes, University of Arizona; Dylinda Wilson-Younger, Alcorn State University; and Karen M. Zabrucky, Georgia State University.

In addition to the reviewers who guided our revisions, our team of editors gave us support in many ways. Kevin Davis, our publisher, guided us with his intelligence, insight, and understanding of the field. Gail Gottfried, our development editor, was available whenever we had questions or needed help and provided us with invaluable support. Kathy Pruno, our copy editor, has been thoroughly professional in her efforts to make the content of the book clear and understandable.

Our appreciation goes to all of these fine people who have taken our words and given them shape. We hope that all of our efforts will result in increased learning for students and more rewarding teaching for instructors.

Finally, we would sincerely appreciate any comments or questions about anything that appears in the book or any of its supplements. Please feel free to contact either of us at any time. Our e-mail addresses are: peggen@unf.edu and don.kauchak@gmail.com.

Good luck and best wishes.

**Paul Eggen**

**Don Kauchak**

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# Brief Contents

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# Contents

chapter 1

# Educational Psychology: Understanding Learning and Teaching


Digital Vision/Getty Images

| OUTLINE | LEARNING OUTCOMES |
|---|---|
| | **After you've completed your study of this chapter, you should be able to:** |
| **The Preeminence of Teachers** | **1.** Describe expert teaching and explain how expert teaching influences student learning. |
| **Educational Psychology, Professional Knowledge, and Expert Teaching**<br>Professional Knowledge<br>Professional Knowledge and Reflective Practice<br>▶ Developmentally Appropriate Practice: Using Knowledge of Learners and Learning to Promote Achievement in Students at Different Ages | **2.** Describe the different kinds of professional knowledge that expert teachers possess. |
| **The Role of Research in Acquiring Professional Knowledge**<br>Quantitative Research<br>Qualitative Research<br>Action Research<br>Design-Based Research<br>Research and the Development of Theory | **3.** Describe different types of research, and explain how research and theory contribute to teachers' professional knowledge. |
| **Teaching in Today's Classrooms**<br>Standards and Accountability<br>Teacher Licensure and Evaluation<br>Learner Diversity<br>Technology<br>The Influence of Neuroscience<br>Educational Psychology and Teaching: Applying Your Professional Knowledge in Today's Classrooms | **4.** Identify factors that influence teaching in today's classrooms. |

You've just opened your textbook, and you're probably wondering what this class will be like and how it will make you a better teacher. So, let's start right off with a couple questions. First, why do children go to school? To learn and develop is the obvious answer. Easy question, right?

Second, which of the following factors contributes the most to students learning and development?

- *Curriculum and materials available to them*—the content students study and the quality of their textbooks.
- *Facilities and extracurricular activities*—access to a good library, the Internet, and athletics, clubs, and after-school music and drama.
- *Class size*—the number of students in a class.
- *Leadership*—such as the school principal and district superintendent.
- *You*—their teacher.

The unequivocal answer is *you, their teacher*! Unlike our first question, however, this answer hasn't always been obvious to educational leaders. We'll explore the importance of excellent teachers in more detail as the chapter unfolds, but before we do, let's turn to a conversation between Keith Jackson, a struggling, first-year, middle school math

teacher, and Jan Davis, a four-year "veteran" who has become his confidant. As you read this case study, think about Jan's teaching and how it might influence her students' learning.

As Keith walks into the work room at Lakeside Middle School, Jan looks up and asks, "Hi, Keith. How's it going?"

"My last period class is getting to me," Keith replies."The students are okay when we just stick to mechanics, but they simply can't do word problems. . . . And they hate them. . . . They just try to memorize formulas and enough to get by.

"I have a good math background, and I was going to be so great when I got here. . . . I'm not so sure any more. . . . I explain the stuff so carefully, but some of the kids just sit with blank looks on their faces. Then, I explain it even more carefully, and . . . nothing.

"And, there's Kelly. She disrupts everything I do. I gave her a referral, and I even called her mother. . . . The only thing that seemed to work was taking her aside and asking her straight out why she was giving me such a hard time."

"Sounds like you're becoming a *teacher*," Jan smiles. "There are few easy answers for what we do. . . . But then, that's what makes it both the toughest and the most rewarding work in the world.

"Like working with Kelly. She might not have another adult she can talk to, and she may simply need someone to care about her.

"As for the blank looks, I'm taking a class at the university. The instructor emphasizes involving the kids, and he keeps talking about research that says how important it is to call on all the kids as equally as possible.

"So, here's an example of how I'm approaching word problems now. We're working on decimals and percents, ultimately to help the kids reach this standard," she says as she shows Keith a lesson plan:

> **CCSS.Math.Content.6.RP.A.3c Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent. (Common Core State Standards Initiative, 2014v).**

"So, here's what I'm doing. I brought in a 12-ounce soft drink can from a machine, a 20-ounce bottle, and a 6-pack with price tags on them.


"I put the kids into pairs and told them to figure out a way to determine which one was the best buy. To figure it out, they needed to apply their understanding of decimals and percents, which helps us reach the standard. I helped them along, and we created a table, so we could compare the groups' answers. They're beginning to see how math relates to their lives. . . . Some of them even said they think it's important. And, now that they're used to being called on, they really like it. It's one of the most important things I do.

"When I think about it, I realize that I sometimes jump in too soon when they can figure it out themselves, and at other times I let them stumble around too long, and they waste time. So, then I adapt for the next lesson."

"I hate to admit this," Keith says, "but some of my university courses suggested just what you did. It was fun, but I didn't think it was real teaching."

"You couldn't relate to it at the time. You didn't have a class with live students who 'didn't get it.'

"Hang in there," Jan smiles. "You're becoming what teaching needs—a real pro."

Now, as you study this chapter, keep the following questions in mind:

1. How was Jan's approach to teaching word problems different from Keith's?
2. Why were their approaches so different, and how will these differences affect their students' learning?

We answer these and other questions about teaching and learning as the chapter unfolds. We begin by revisiting the idea we introduced at the beginning of the chapter.

## The Preeminence of Teachers

In our introduction we asked, "Which of the following factors contributes the most to student's learning and development?" and we said that the answer hasn't always been obvious to educational leaders. In an effort to improve schooling, a great deal has been written about this question, and reformers have offered a variety of answers, including different organizational structures, such as open classrooms, and a variety of curricular and instructional approaches, such as Whole Language, or what was commonly described as "New Math." However, none of them were as successful as hoped (Thomas & Wingert, 2010).

The solution, however, is simple (but admittedly not easy). No organization, system, institution, or enterprise is any better than the people in it, and the same applies to schools. The quality of a school is determined by the quality of its teachers. *You* are the most important factor influencing your students' learning! Surprisingly, in spite of many years of research documenting the importance of teachers, only within approximately the last two decades have educational leaders begun to understand and appreciate this fact (Thomas & Wingert, 2010).

Let's look at some of this research. One widely publicized study conducted 20 years ago found that students who had expert teachers in third, fourth, and fifth grades scored more than 50 percentile points higher on standardized math tests than those in the same three grades who were taught by teachers less skilled (Sanders & Rivers, 1996). Another study revealed that five years in a row of expert teaching was nearly enough to close the achievement gap between disadvantaged and advantaged students (Hanushek, Rivkin, & Kain, 2005). Additional research has found that expert teaching in later grades could substantially, though not completely, make up for poor teaching in earlier grades (Rivkin, Hanushek, & Kain, 2001). More recent research corroborates the assertion that the expertise of teachers is the key to increased student achievement (Konstantopoulos, 2011; Kraus et al., 2008; Kunter et al., 2013).

The importance of teachers even caught the attention of the popular press. "The Key to Saving American Education" appeared on the cover of the March 15, 2010, issue of *Newsweek*, identifying teachers as the "key," and the *New York Times* included a lengthy article, "Building a Better Teacher," in its March 7, 2010, issue (Green, 2010). "Teacher quality is now a national priority" (Margolis, 2010, Introduction, para. 1). The American people agree. According to an annual poll of the public's attitudes toward public education, "Americans singled out improving the quality of teachers as the most important action for improving education" (Bushaw & Lopez, 2010, p. 15). Also, the quality of teachers is linked to the widely publicized success of students in other countries (Friedman, 2013). And, some good news: public opinion polls indicate that "More than 70% of Americans have trust and confidence in the men and women who teach in public schools" (Bushaw & Lopez, 2013, p. 12).

Some, including many educational leaders, once believed that expert teaching is essentially instinctive, a kind of magic performed by born superstars. And, just as is the case with other domains, such as athletics, music, or art, some teachers do indeed have more natural ability than others. However, research dating back to the 1960s and 1970s indicates

Video 1.1 Expert teachers possess professional knowledge, skills, and attitudes that increase learning for all their students. A principal describes what he would look for if he could have an ideal teacher working in his school.

ENHANCEDetext *video example*

that expert teachers possess knowledge and skills that are not purely instinctive. They are acquired through study and practice (Fisher et al., 1980), and more recent work corroborates these earlier findings (Kunter et al., 2013; Lemov, 2010). This is true in all domains. For example, many athletes, through awareness and hard work, perform better than their counterparts with more natural ability.

We referred to "expert" teachers in the preceding paragraphs. **Experts** are people who are highly knowledgeable and skilled in a particular domain, such as music, architecture, medicine, or teaching. Expert teachers' professional knowledge and skills are what set them apart from their less effective colleagues. This knowledge and these skills make them capable of producing learning in students that less able teachers cannot produce.

This leads us to the reason we wrote this book and the reason you're taking this course. Your goal is to begin acquiring the knowledge and skills that will ultimately lead to expertise, and our goal is to help you in this process. We turn to this topic next.

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# Educational Psychology, Professional Knowledge, and Expert Teaching

If expertise is so important to effective teaching, how do teachers gain the knowledge and skills needed to become experts? This leads us to the study of **educational psychology (ed psych)**, the academic discipline that examines human teaching and learning (Berliner, 2006). The content of educational psychology contributes to the professional knowledge base you will need to become an expert teacher. We discuss this professional knowledge in the following sections.

## Ed Psych and You

How much do you know about teaching and learning? To test your knowledge, complete the following Learning and Teaching Inventory. It will introduce you to the kinds of knowledge you'll need to become an expert teacher.

## Professional Knowledge

**Professional knowledge** refers to the body of information and skills that are unique to an area of study, such as law, medicine, architecture, or engineering. The same applies to teaching. In this section we focus on how educational psychology can increase your professional knowledge, and with it, your expertise.

To introduce you to the idea of professional knowledge in teaching, respond to each of the items in the *Learning and Teaching Inventory* below.

### Learning and Teaching Inventory

Look at each of the 12 items, and decide if the statement is true or false.

1. The thinking of children in elementary schools tends to be limited to the concrete and tangible, whereas the thinking of middle and high school students tends to be abstract.
2. Students generally understand how much they know about a topic.

3. Experts in the area of intelligence view knowledge of facts, such as "On what continent is Brazil?," as one indicator of intelligence.
4. Expert teaching is essentially a process of presenting information to students in succinct and organized ways.
5. Preservice teachers who major in a content area, such as math, are much more successful than nonmajors in providing clear examples of the ideas they teach.
6. To increase students' motivation to learn, teachers should praise as much as possible.
7. The key to successful classroom management is to stop disruptions quickly.
8. Preservice teachers generally believe they will be more effective than teachers who are already in the field.
9. Teachers learn by teaching; in general, experience is the primary factor involved in learning to teach.
10. Testing detracts from learning, because students who are tested frequently develop negative attitudes and consequently learn less than those who are tested less often.
11. Criticizing students damages their self-esteem and should be avoided.
12. Because some students are left-brained thinkers and others are right-brained thinkers, teachers should make an effort to accommodate these differences in their students.

Let's see how you did. The correct answers for each item are outlined in the following paragraphs. As you read the answers, remember that they describe students or other people in general, and exceptions will exist.

1. *The thinking of children in elementary schools tends to be limited to the concrete and tangible, whereas the thinking of middle and high school students tends to be abstract.*
   **False:** Research indicates that middle school, high school, and even university students can effectively think in the abstract only when they have considerable prior knowledge and experience related to the topic they're studying (Berk, 2013; Cole, Cole, & Lightfoot, 2009). When you study the development of students' thinking in Chapter 2, you'll see how understanding this research can improve your teaching.
2. *Students generally understand how much they know about a topic.*
   **False:** Learners, in general, and young children in particular, often cannot accurately assess their own understanding (Hacker, Bol, Horgan, & Rakow, 2000). Students' awareness of what they know and how they learn strongly influences understanding, and cognitive learning theory helps us understand why. (You will study cognitive learning theory in Chapters 7, 8, and 9.)
3. *Experts in the area of intelligence view knowledge of facts, such as "On what continent is Brazil?," as one indicator of intelligence.*
   **True:** The Wechsler Intelligence Scale for Children—Fourth Edition (Wechsler, 2003), the most popular intelligence test in use today, includes several items similar to this example. We examine theories of intelligence, including controversies involved in these theories, in Chapter 5.
4. *Expert teaching is essentially a process of presenting information to students in succinct and organized ways.*
   **False:** The better we understand learning, the more we realize that simply explaining information to students is often ineffective for promoting learning (Kunter et al., 2013; Mayer, 2008). Learners construct their own knowledge based on what they already know, and their emotions, beliefs, and expectations all influence the process (Bruning, Schraw, & Norby, 2011; Schunk, Meece, & Pintrich, 2014). You will study the process of knowledge construction in Chapter 9.
5. *Preservice teachers who major in a content area, such as math, are much more successful than nonmajors in providing clear examples of the ideas they teach.*
   **False:** One of the most pervasive misconceptions about teaching is the idea that knowledge of subject matter is all that is necessary to teach effectively. In a study of

teacher candidates, researchers found that math majors were no more capable than nonmajors of effectively illustrating math concepts in ways that learners could understand (U.S. Department of Education, 2008). Knowledge of content is essential for expert teaching, but understanding how to make that content meaningful to students requires additional knowledge (Darling-Hammond & Baratz-Snowden, 2005; Kunter et al., 2013). You will study ways of making knowledge accessible to learners in Chapters 2, 6–9, and 13.

6. *To increase students' motivation to learn, teachers should praise as much as possible.*
   **False:** Although appropriate use of praise is effective, overuse detracts from its credibility. This is particularly true for older students, who discount praise if they believe it is invalid or insincere. Older students may also interpret praise given for easy tasks as indicating that the teacher thinks they have low ability (Schunk et al., 2014). Your study of motivation in Chapters 10 and 11 will help you understand this and other factors influencing students' motivation to learn.
7. *The key to successful classroom management is to stop disruptions quickly.*
   **False:** Research indicates that classroom management, a primary concern of beginning teachers, is most effective when teachers prevent management problems from occurring in the first place, instead of responding to problems after they occur (Brophy, 2006; Emmer & Evertson, 2013; Evertson & Emmer, 2013). You will study classroom management in Chapter 12.
8. *Preservice teachers generally believe they will be more effective than teachers who are already in the field.*
   **True:** Preservice teachers (like you) are often optimistic and idealistic. They believe they'll be effective with young people, and they generally believe they'll be better than teachers now in the field (Feiman-Nemser, 2001; Ingersoll & Smith, 2004). They are also sometimes "shocked" when they begin work and face the challenge of teaching on their own for the first time (Grant, 2006; Johnson & Birkeland, 2003). Keith's comments in the opening case study are typical of many beginning teachers: "I was going to be so great when I got here. . . . I'm not so sure anymore." Teaching is complex and challenging, and the more knowledge you have about learners, learning, and the teaching process, the better prepared you'll be to cope with the realities of your first job.
9. *Teachers learn by teaching; in general, experience is the primary factor involved in learning to teach.*
   **False:** Experience is essential in learning to teach, but it isn't sufficient by itself (Darling-Hammond & Bransford, 2005; Song & Felch, 2009; Kunter et al., 2013). In some cases, experience results in repeating the same actions year after year, regardless of their effectiveness. Knowledge of learners and learning, combined with experience, however, can lead to high levels of teaching expertise.
10. *Testing detracts from learning, because students who are tested frequently develop negative attitudes and consequently learn less than those who are tested less often.*
    **False:** In comprehensive reviews of the literature on assessment, experts have found that frequent, thorough assessment is one of the most powerful and positive influences on learning that exist (Rohrer & Pashler, 2010; Stiggins & Chappuis, 2012). This emphasis focuses on assessment *for* learning, however, and not the emphasis—and many argue *overemphasis*—on high-stakes standardized testing (Stiggins & Chappuis, 2012).
11. *Criticizing students damages their self-esteem and should be avoided.*
    **False.** Under certain circumstances, criticism can increase motivation and learning. For instance, criticism, such as a teacher saying, "Come on, you can do better work than this," communicates high expectations to students and the belief that they are capable learners. We're not suggesting that you make criticizing students

a habit, but periodic and well-timed criticism can enhance motivation (Deci & Ryan, 2008).

12. *Because some students are left-brained thinkers and others are right-brained thinkers, teachers should make an effort to accommodate these differences in their students.* **False.** The idea that we tend to be right-brained or left-brained is a myth (Boehm, 2012; Jarrett, 2012; Nielsen, Zielinski, Ferguson, Lainhart, & Anderson, 2013). "This popular myth, which conjures up an image of one side of our brains crackling with activity while the other lies dormant, has its roots in outdated findings from the 1970s . . ." (Boehm, 2012, para. 1).

The items you've just examined briefly introduce you to the professional knowledge base that will help you acquire teaching expertise. In the next section we examine this knowledge in more detail. Research indicates that four related types of knowledge are essential for expert teaching (Darling-Hammond & Baratz-Snowden, 2005; Kunter et al., 2013; Shulman, 1987). They are outlined in Figure 1.1 and discussed in the sections that follow.

## KNOWLEDGE OF CONTENT

We obviously can't teach what we don't understand. To effectively teach about the American Revolutionary War, for example, a social studies teacher needs to know not only basic facts about the war but also how the war relates to other aspects of history, such as the French and Indian War, the colonies' relationship with England before the Revolution, and the unique characteristics of the colonies. The same is true for any topic in any other content area, and research confirms the relationship between what teachers know and how they teach (Bransford, Brown, & Cocking, 2000).

## PEDAGOGICAL CONTENT KNOWLEDGE

Knowledge of content is essential, but, alone, not sufficient for expert teaching. We must also possess **pedagogical content knowledge**, an understanding of how to represent topics in ways that make the content understandable to learners, as well as an understanding of what makes specific topics easy or difficult to learn (Darling-Hammond & Bransford, 2005; Kunter et al., 2013; Shulman, 1986). It also includes teachers' abilities to identify students' most common misconceptions and to help students resolve their misunderstandings (Sadler, Sonnert, Coyle, Smith, & Miller, 2013).

The following quote supports the idea that pedagogical content knowledge (PCK) is essential for teaching expertise. "Yet as a new insight, our study also showed that teachers' PCK affects not only students' achievement but also their motivation, specifically their enjoyment of the subject . . ." (Kunter et al., 2013, p. 815). Expert teachers understand the

Video 1.2 Teachers demonstrate pedagogical content knowledge when they represent topics in ways understandable to students. This teacher helps her students understand the concept *arthropod* by showing them a real lobster.

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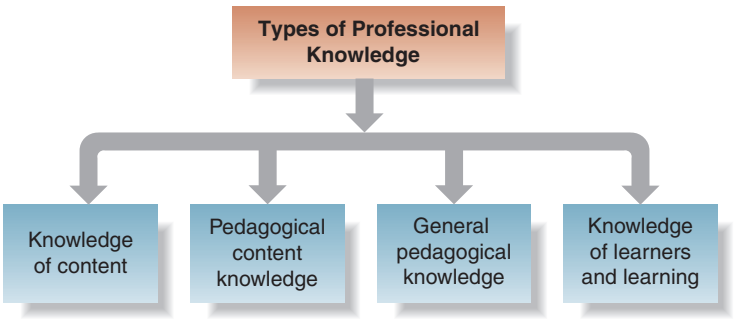


**Figure 1.1**
**Types of professional knowledge**