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EDUCATIONAL PSYCHOLOGY

DEVELOPING LEARNERS

TENTH EDITION

Tenth Edition

Educational Psychology

Developing Learners

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Dedication

To Jack
—Jeanne

To our parents Gloria and Arthur, Myra and Noel,
and our children Jacob and Sarah
—Eric and Lynley

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About the Authors

Jeanne Ellis Ormrod received her A.B. in psychology from Brown University and her M.S. and Ph.D. in educational psychology from The Pennsylvania State University. She earned licensure in school psychology through postdoctoral work at Temple University and the University of Colorado at Boulder and has worked as a middle school geography teacher and school psychologist. She was Professor of Educational Psychology at the University of Northern Colorado until 1998, when she moved east to return to her native New England. She has published and presented extensively on cognition and memory, cognitive development, instruction, and related topics but is probably best known for this book and four others: *Human Learning* (currently in its eighth edition); *Essentials of Educational Psychology* (currently in its fifth edition and now coauthored with Brett D. Jones); *Child Development and Education* (co-authored with Teresa McDevitt, soon to come out in its seventh edition); and *Practical Research* (co-authored with Paul Leedy, currently in its twelfth edition). She and her husband Richard live in New Hampshire, where (she is happy to report) she is within a 90-minute drive of her three young grandchildren. Her most recent challenge has been to stretch her mind in new directions through improvisational theater, which is more fun than she could ever have imagined.

Eric M. Anderman holds a B.S. degree in Psychology and Spanish from Tufts University, an Ed.M. from Harvard University, and a Ph.D. in Educational Psychology from The University of Michigan. After completing his Masters degree, he worked as a high school and middle school teacher for several years, before returning to graduate school. He is currently Professor of Educational Psychology and Chair of the Department of Educational Studies at The Ohio State University. His research focuses on (a) academic motivation, (b) academic cheating, and (c) motivation and risky behavior during adolescence. He is currently the editor of the journal *Theory into Practice*, and formerly was associate editor of the *Journal of Educational Psychology*. He co-authors two other textbooks also published by Pearson: *Classroom Motivation* (now in its second edition) with Lynley Anderman, and *Adolescent Development for Educators*, with Alison Ryan and Tim Urdan. He recently co-edited the third edition of the *Handbook of Educational Psychology* (published by Routledge) with Lyn Corno, and *The International Guide to Student Achievement* (published by Routledge) with John Hattie.

Lynley H. Anderman received her B.A. and M.A. (Hons.) in Education from the University of Auckland, New Zealand, and her Ph.D. from the Combined Program in Education and Psychology at The University of Michigan. A graduate of North Shore Teachers College (Auckland, New Zealand), she taught for several years in primary and intermediate schools in Auckland. Currently, she is Professor of Educational Psychology at The Ohio State University. She has published and presented extensively on academic motivation, particularly in relation to the roles of instructional and social-relational characteristics of classrooms that support students' motivation and engagement, including students' sense of belonging, teacher–student and peer relationships. She also has written and presented on the role of educational psychology in teacher education. Dr. Anderman is the former editor of the *Journal of Experimental Education*, and former associate editor of *Theory into Practice*. She has co-edited *Psychology of Classroom Learning* (published by Cengage) and *Classroom Motivation* (published by Pearson) with Eric Anderman.

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Preface

New to This Edition

Many features that have made previous editions of the book so popular with instructors and students remain in this edition, including a conversational writing style, Experiencing Firsthand features, organizational tables and diagrams, a focus within each chapter on both developmental issues and diversity, and an ongoing emphasis on classroom applications. Yet there are also significant changes. First, we went through the entire book and really tried to make sure that all of our explanations are clear and conversational in nature; thus we eliminated some highly specific details (e.g., research findings) that were not relevant for practicing teachers. As always, all 15 chapters have been updated to reflect recent advances in research, theory, and classroom practices. In this edition, we also made a concerted effort to discuss technology throughout the book; we focus both on how teachers can use new technologies to enhance instruction, and on how technology has changed the lives of the students in our classrooms. We have continued to enhance the eText and MyLab Education to provide even more interactivity than in the previous edition. Thus in each chapter, readers can regularly apply what they're learning to actual and hypothetical classroom scenarios and problems. Interactive features include Self-Check Quizzes, Application Exercises, and case study analyses in the Licensure Exam activities; all of these features ask readers to respond to either open-ended or multiple-choice questions, and then give readers immediate feedback about their responses. Such features, along with many hot-linked Video Examples and Video Explanations—the latter of which target concepts and principles that students in educational psychology classes sometimes struggle to understand and apply—make the tenth edition of the book a truly multimedia learning experience. In this edition of *Educational Psychology: Developing Learners*, Jeanne Ormrod revised chapters 1, 6, 7, 8, and 9; Eric and Lynley Anderman revised chapters 2, 3, 4, 5, 10, 11, 12, 13, 14, and 15.

More specific additions and changes to this edition include the following:

- Chapter 1: Reorganized major sections of the chapter; added a new beginning section "Reflecting on What You Already Know About Learning and Instruction"; added an additional recommendation regarding self-regulation in the "Studying and Learning Effectively" section.
- Chapter 2: Added a new introductory scenario focusing on differences in conceptual understanding in young children; added new research on the effects of the quality of preschool experiences and exposure to diversity on cognitive development; incorporated new research suggesting that children develop some cognitive strategies earlier than researchers had previously thought; increased discussion of the role of technology in cognitive development; expanded discussion of bilingual education.
- Chapter 3: Expanded discussion of the relevance of Erikson's theory of identity development for educators; added new information regarding technology and its role in peer relationships; updated three of the visual examples (classroom artifacts); added information about the benefits of autonomy-supportive parenting.
- Chapter 4: Incorporated new content, including a discussion of intersectionality at the beginning of the chapter, and integrated this concept throughout the chapter; added definition and examples of cultural competence; added discussion on cultural biases in textbooks; increased coverage of immigration; expanded discussion of implications of between and within group variability.
- Chapter 5: Added information about Multi-Tiered Systems of Support; updated sections on PBIS and SPBIS; added a new section on "Medication and ADHD"; reduced discussion of Catell and Catell-Horn; added discussion and description of universal design; added perspectives on improving learning environments for students with hearing loss.
- Chapter 6: Shortened descriptions of theoretical perspectives in Table 6.1; added a new section, "Using Technology to Promote Meaningful Learning"; added a new Application Exercise that illustrates the use of technology in a high school nutrition class; added a new Experiencing Firsthand exercise that evokes the Stroop effect as an example of automaticity; added a new recommendation regarding the importance of explicitly discouraging late-night studying sessions ("pulling all-nighters").
- Chapter 7: Added a new bulleted paragraph regarding the importance of self-regulation skills in strategic learning; added a new bulleted section on the use of computer-based simulations to promote transfer; integrated the previous edition's sections on problem solving and creativity into a single section "Problem Solving and Creativity," incorporated a section on simulations and games (previously in Chapter 12), with major updates to the content; expanded the section "Critical Thinking" to include (a) *argument analysis* as a key term, (b) reasons why people often don't engage in

critical thinking, (c) prevalence of "fake news" in popular media, and (d) assessment of critical thinking skills.

- Chapter 8: Expanded discussion of communities of learners to include the concept of *knowledge building*; expanded the section "Cultures as Contexts" to include the idea that cultures change over time, especially as they come into contact with other cultures; divided the previous edition's single section "Society and Technology as Contexts" into two sections; incorporated a new example illustrating collaboration with a local community agency; significantly revised and reorganized the discussion of technology, with a new section on *online learning*; added a new Application Exercise 8.3 regarding the use of technology to foster communication with and learning from students in diverse geographical locations.
- Chapter 9: Reduced discussion of the nature of early behaviorist views; added information on the use of clickers; integrated strategies for encouraging productive behaviors and discouraging undesirable behaviors into a single section; included a new section "Thinking Carefully About the Consequences You Either Intentionally or Unintentionally Impose"; expanded discussion of *schoolwide positive behavioral interventions and supports* (building on what was presented earlier in Chapter 5).
- Chapter 10: Added a new scenario comparing students at two different developmental levels; added discussion of using technology to model skills that involve motor reproduction; added strategies teachers can use to enhance self-efficacy in their students; added two new Experiencing Firsthand exercises; included a new section on "Self-Regulation in Online Learning Environments."
- Chapter 11: Updated section on work-avoidance goals; added a new section on "Short-Term Motivation Interventions"; added a new table (11.2) describing implementation and results of short-term motivation interventions; provided additional discussion of the importance of expectancies and values as determinants of student motivation and of future academic and career choices.
- Chapter 12: Updated information on using websites; added a new section on helping students learn how to learn; removed specific suggestions for aligning instructional practices with the Common Core State Standards; updated examples to include use of current technology (e.g., use of *Google Earth* in geography lessons; cautious use of YouTube videos).
- Chapter 13: Added a new section on bullying and cyberbullying; added a new section on "recognizing microaggressions"; added discussion on the importance of creating a sense of belonging, as well as some cautions to consider; expanded discussion of parental involvement, including some of the fiscal and job-related constraints that preclude some parents from being as involved as they might want.
- Chapter 14: Added a table on how to provide effective feedback; included a new Experiencing Firsthand exercise illustrating the concept of reliability of measurement; updated the section on the use of digital technologies for assessment to reflect current information, technology, and terminology.
- Chapter 15: Added a discussion of implications of the *Every Student Succeeds Act*; added a discussion regarding cautions to think about when considering the role of effort in students' grades; related information on norm-referenced testing to the discussion of student motivation from Chapter 11.

General Rationale for the Book

As teachers, we play critical roles in the lives of children and adolescents. Some of us help them learn to read and write. Some of us help them understand their physical and social worlds through explorations of science, mathematics, geography, history, foreign languages, or literature. Some of us help them express themselves through physical movement, the visual arts, or music. And some of us teach them specific skills they will need as adult professionals in, say, auto mechanics, cooking, or new technologies. But regardless of the subject matter we teach, we help those in the generations that follow us to become knowledgeable, self-confident, and productive citizens.

In our minds, teaching is the most rewarding profession we could possibly choose. Yet it's often a challenging profession as well. Students don't always come to us ready or eager to learn. How can we help them develop the knowledge and skills they need to become productive adults? What strategies can we use to motivate them? What tasks and instructional materials are appropriate for students at different developmental levels? Are the instructional practices that we use sensitive to the diversity of our students? Over the years, researchers and practitioners have worked together to answer such questions. Collectively, we're in the fortunate position of being able to benefit from the many insights that such experts offer.

All three of us have been teaching educational psychology for many years, and we've loved every minute of it. How children and adolescents learn and think, how they change as they grow and develop, why they do the things they do, how they're often very different from one another—our understandings of all of these things have innumerable implications for classroom practice and, ultimately, for the lives of young people. Because we want the

field of educational psychology to captivate you the way it has captivated us, we've tried to make the book interesting, meaningful, and thought provoking as well as informative and timely.

Helping Our Readers Learn and Apply Educational Psychology

You can gain much more from your study of educational psychology when you:

- Focus on core concepts and principles of the discipline
- See these principles in action in your own learning and behavior
- Use the principles to understand the learning and behavior of children and adolescents
- Consistently apply the principles to classroom practice

You'll find numerous features throughout the book to help you do all of these things. We authors hope you'll learn a great deal from what educational psychology has to offer, not only about the students you may be teaching but also about yourself.

Focusing on Core Concepts and Principles

Rather than superficially explore every aspect of educational psychology, this book zeroes in on fundamental concepts and principles that have broad applicability to classroom practice. Throughout the book, core concepts appear in boldfaced blue font. Core principles are clearly identified within each section with boldfaced blue headings. See the following sections for some examples: *General Principles of Human Development* in Chapter 2 and *Basic Assumptions of Cognitive Psychology* in Chapter 6.

Seeing Concepts and Principles in Action in Your Own Learning

A central goal of this book has always been to help our readers discover more about themselves as thinkers and learners. Thus we include *Experiencing Firsthand* exercises throughout the book—exercises that illustrate such diverse concepts as constructive processes, working memory, sense of self, social cognition, ethnic stereotyping, and confidentiality in assessment. All of these exercises are designed to do exactly what their name implies: help our readers observe principles of educational psychology *in themselves*. See the sections on *The Nature of Working (Short-Term) Memory* and *Moving Information to Long-Term Memory* in Chapter 6 for some examples.

Understanding Children's and Adolescents' Learning and Behavior

Throughout the book we continually urge our readers to look closely at and try to make sense of what children and adolescents do and say. Each chapter begins with a *Case Study* that situates chapter content in a real-life scenario. We also make frequent use of *real artifacts* from children's journals and school assignments to illustrate concepts and principles in action. For example, see sections *Roles of Peers in Children's Development* in Chapter 3 and *How Knowledge Can Be Organized* in Chapter 6.

Examining Developmental Trends

Unique to this book is a focus on children's and adolescents' development in every chapter. For example, most chapters have one or more *Developmental Trends* tables that summarize age-typical characteristics at four grade levels (K–2, 3–5, 6–8, and 9–12), present concrete examples, and offer suggested classroom strategies for each level. You can find examples of these tables in the sections *Gender Differences* in Chapter 4 and *How Procedural Knowledge is Learned* in Chapter 6.

Applying Core Ideas of Educational Psychology to Classroom Practice

Throughout this text, psychological concepts and principles are consistently applied to classroom practice. We also provide *Into the Classroom* and *Creating a Productive Classroom Environment* boxes that suggest and illustrate strategies related to particular areas of concern for teachers. You can find examples in the sections *Contemporary Extensions and Applications of Vygotsky's Theory* in Chapter 2 and *How Knowledge Can Be Organized* in Chapter 6.

This book is consistently praised for its emphasis on application. Throughout the book we identify suggested strategies—within the text, in tables, and in the margins—with apple icons; for instance, see the *Applying Brain Research* feature in Chapter 2.

Helping You Prepare for Licensure

All chapters end with *Practice for Your Licensure Exam* exercises. These exercises provide readers with opportunities to use the content they've learned in a particular chapter to answer multiple-choice and constructed-response questions similar to those that appear on many teacher licensure tests. See the end of any chapter.

Ancillary Materials

The following resources are available for instructors to download on www.pearsonhighered.com/educators. Instructors can enter the author or title of this book, select this particular edition of the book, and then click on the "Resources" tab to log in and download textbook supplements.

Instructor's Resource Manual (ISBN 0-13-520815-7)

An Instructor's Resource Manual includes suggestions for learning activities, additional Experiencing Firsthand exercises, supplementary lectures, case study analyses, discussion topics, group activities, and additional media resources.

PowerPoint® Slides (ISBN 0-13-520822-X)

The PowerPoint slides include key concept summarizations, diagrams, and other graphic aids to enhance learning. They are designed to help students understand, organize, and remember core concepts and theories.

Test Bank (ISBN 0-13-520819-X)

Jeanne personally wrote many of the test questions in the Test Bank that accompanies the book. Test Bank coauthors have added new ones to reflect the updates to the tenth edition. Some items (lower-level questions) simply ask students to identify or explain concepts and principles they have learned. But many others (higher-level questions) ask students to apply those same concepts and principles to specific classroom situations—that is, to actual student behaviors and teaching strategies. Ultimately it is these higher-level questions that assess students' ability to use principles of educational psychology in their own teaching practice.

TestGen (ISBN 0-13-520814-9)

TestGen is a powerful test generator that you install on your computer and use in conjunction with the TestGen test bank file for your text. Assessments, including equations, graphs, and scientific notation, may be created for both print and online testing.

TestGen is 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.

The tests can be downloaded in the following formats:
TestGen Test bank file—MAC
TestGen Test bank file—PC
Angel TestGen Conversion
Test Bank for Blackboard Learning System
Desire to Learn TestGen Conversion
Moodle TestGen Conversion
Sakai TestGen Conversion
Test Bank for Blackboard CE/Vista

Case Studies: Applying Educational Psychology (2nd ed.)

Many instructors use Ormrod and McGuire's *Case Studies* book (0-13-198046-7) as a supplement to this book. It includes 48 real cases involving students and classrooms ranging from preschool to high school. It illustrates concepts and principles in many areas of educational psychology, including child and adolescent development, learning and cognition, motivation, classroom management, instructional practices, and assessment.

Acknowledgments

We've been fortunate to have had a great deal of help in writing this book. First and foremost, the book wouldn't be what it is today without long-term partnerships with Kevin Davis. Kevin first came on board as developmental editor for the book with Jeanne in 1989 and, except for a two-year hiatus while he served in other roles at Pearson, has continued to guide the book through its multiple iterations, first only in paper and now in the ever-changing digital world. Although Kevin hasn't penned the words, his influence permeates every page of text and every hotlinked activity. His ideas, suggestions, and occasional gentle demands have consistently pushed and stretched us to new heights in our efforts to create the best possible pedagogical experience for readers.

We are also deeply indebted to developmental editor Pam Bennett, who has kept all three of us on course, reminding us of both our short-term and long-term targets. Pam gently encouraged us to stay on track, and to strive for excellence and quality throughout the entire book. Project manager Kathy Smith expertly organized and oversaw the countless steps involved in transforming our word-processed manuscripts and rough sketches into the finished product you see before you. In this high-tech day and age, publishing a book is a very complicated process and we are grateful for her expertise. Many thanks, too, to Alyssa Emery, who has updated the Self-Check Quizzes and some of the new Application Exercises in MyLab Education. In fact, she took charge of the overall media plan for Chapters 2–5 and Chapters 10–15, and created all of the new Application Exercises for those chapters.

In addition, numerous colleagues across the nation have strengthened the book itself by reviewing one or more of its previous versions. Reviewers for the first eight editions were Jane Abraham, Virginia Tech University; Joyce Alexander, Indiana University; Eric M. Anderman, then at University of Kentucky; Linda M. Anderson, Michigan State University; Margaret D. Anderson, SUNY–Cortland; Cindy Ballantyne, Northern Arizona University; J. C. Barton, Tennessee Technical University; Timothy A. Bender, Southwest Missouri State University; Stephen L. Benton, Kansas State University; Karen L. Block, University of Pittsburgh; Kathryn J. Biacindo, California State University–Fresno; Barbara Bishop, Eastern New Mexico University; Angela Bloomquist, California University of Pennsylvania; Phyllis Blumenfeld, University of Michigan; Gregory Braswell, Illinois State University; Robert Braswell, Winthrop College; Kathy Brown, University of Central Oklahoma; Randy L. Brown, University of Central Oklahoma; Kay S. Bull, Oklahoma State University; E. Namisi Chilungu, Georgia State University; Margaret W. Cohen, University of Missouri–St. Louis; Theodore Coladarci, University of Maine; Sharon Cordell, Roane State Community College; Roberta Corrigan,

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Coming on board for the tenth edition were these reviewers, who offered helpful suggestions now reflected in the book: Karen Cross, University of North Carolina–Charlotte, and Erin McClure, The Ohio State University.

Some of our own students and teacher interns—especially Jenny Bressler, Kathryn Broadhead, Ryan Francoeur, Gerry Holly, Michel Minichiello, Shelly Lamb, Kim Sandman, Melissa Tillman, Nick Valente, and Brian Zottoli—have at one time or another agreed to let us use their interviews, essays, and experiences as examples. Teachers and administrators at schools both home and abroad (including two of Jeanne's children, now teachers themselves) have allowed us to share their strategies with our readers; we thank Liz Birnam, Berneen Bratt, Tom Carroll, Barbara Dee, Jackie Filion, Tina Ormrod Fox, Sarah Gagnon, Dinah Jackson, Sheila Johnson, Don Lafferty, Gary MacDonald, Sharon McManus, Linda Mengers, Mark Nichols, Jeff Ormrod, Ann Reilly, and Gwen Ross. The Andermans are particularly grateful to three of their current and former graduate students, Megan Sanders, Alyssa Emery, and Elizabeth Kraatz, who assisted them with administrative tasks in the preparation of their chapters, and their graduate teaching assistants, especially Naima Khandaker, Elizabeth Kraatz, and Kristin Henkaline, who have provided valuable feedback on the book, as they use it with their own students.

Many young people, too, deserve thanks for letting us use their work. In particular, we want to acknowledge the contributions of the following present and former elementary and secondary school students: Andrew and Katie Belcher; Noah and Shea Davis; Zachary Derr; Amaryth, Andrew, and Anthony Gass; Ben and Darcy Geraud; Dana Gogolin; Colin Hedges; Erin Islo; Charlotte Jeppsen; Laura Linton; Michael McShane; Frederik Meissner; Alex, Jeff, and Tina Ormrod; Patrick Paddock; Isabelle Peters; Cooper Remignanti; Ian Rhoads; David and Laura Riordan; Corey and Trisha Ross; Ashton and Haley Russo; Alex and Connor Sheehan; Matt and Melinda Shump; Andrew Teplitz; Emma Thompson; Grace Tober; Grant Valentine; Caroline and Hannah Wilson; and Geoff Wuehrmann.

Last but certainly we must thank our families, who have forgiven our countless hours spent either buried in our books and journals or else glued to our computers. Without their continuing understanding and support, this tenth edition would never have seen the light of day.

Brief Contents

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Chapter 1

Teaching and Educational Psychology

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Learning Outcomes

1.1 Reflect on and evaluate some of your existing knowledge and beliefs about human learning and effective instructional practices.

1.2 Use effective strategies when you read and study.

1.3 Develop a long-term plan for gaining expertise as a teacher.

1.4 Draw appropriate conclusions from various kinds of research studies.

1.5 Describe several strategies for collecting information about your own students.

CASE STUDY:

The "No D" Policy

Anne Smith is a ninth-grade English teacher with 10 years of teaching experience, and by all accounts, she's an excellent teacher. Even so, in past years many of her students haven't invested much time or energy in their writing assignments and haven't appeared to be bothered by the low grades they've earned in her classes. In an effort to more fully engage this year's students in their schoolwork, Ms. Smith begins fall semester by initiating two new policies. First, to pass her course, students must earn at least a C; she won't give anyone a final grade of D. Second, students will have multiple opportunities to revise and resubmit assignments; she'll provide whatever feedback students need—and, if necessary, also provide one-on-one instruction—to help them improve their work. She solicits students' questions and concerns about the new policies, gains their agreement to "try something new," and engages them in a discussion of specific, concrete characteristics of A-quality, B-quality, and C-quality work. Then, as the semester progresses, she regularly administers brief surveys to get students' feedback about her innovations, asking such questions as "How is the 'no D' working for you?" "Do you think your grade is an accurate reflection of your learning?" and "Any suggestions?"

Students' responses on the surveys are overwhelmingly positive. Students mention noticeable improvements in the quality of their writing and increasingly report that they believe themselves to be in control of both their learning and their grades. Furthermore, they begin to see their teacher in a new light—"as one who will help them achieve their best work, not as one who just gives out grades . . . as a coach encouraging them along the long race of learning." Final course grades also confirm the value of the new policies: A much higher percentage of students earn grades of C or better than has been true in past years. (Action research project described in A. K. Smith, 2009.)

- Effective teachers don't simply transmit new information and skills to students; they also work hard to help students *master* the information and skills. In the case study just presented, what various strategies does Ms. Smith use to foster her students' writing development?

Teaching other people—especially teaching the generation that will follow you into the adult world—can be one of the most rewarding professions on the planet. It can also be a very challenging profession. Certainly, effective teaching involves presenting a topic or skill in such a way that students can understand and eventually master it. Yet it involves many other things as well. For instance, teachers must motivate students to *want* to learn the subject matter, must help students recognize what genuine learning actually involves, and—in order to appropriately individualize instruction—must assess each student's progress in learning and development. And, in general, good teachers create an environment in which students believe that if they work hard and have reasonable support, they can achieve at high levels. In the opening case study, Anne Smith does all of these things.

For teachers, mastering the multifaceted nature of teaching takes time and practice, of course. But it also takes considerable knowledge about human learning and motivation, developmental trends, individual and group differences, and effective classroom practices. Such topics are the domain of **educational psychology**. This book will help you understand children and adolescents—how they learn and develop, how they're likely to be similar to but also different from one another, and what topics and activities are apt to engage them in the classroom. It will also give you a toolbox of strategies for planning and carrying out instruction, creating an environment that keeps students motivated and on task, and assessing students' progress and achievement.

Reflecting on What You Already Know About Learning and Instruction

1.1 Reflect on and evaluate some of your existing knowledge and beliefs about human learning and effective instructional practices.

You yourself have been a student for many years now, and in the process you've undoubtedly learned a great deal about how children change over time and about how teachers can foster their learning and development. But exactly how much *do* you know? To help you find out, we authors offer a short pretest, Ormrod's Own Psychological Survey (OOPS).

Experiencing Firsthand

Ormrod's Own Psychological Survey (OOPS)

Decide whether each of the following statements is *true* or *false.*

True	False	1.	Some children are predominantly left-brain thinkers, whereas others are predominantly right-brain thinkers.
True	False	2.	Children's personalities are largely the results of their home environments.
True	False	3.	Instruction is most effective when it is tailored to students' individual learning styles.
True	False	4.	The best way to learn and remember a new fact is to repeat it over and over.
True	False	5.	Students often misjudge how much they know about a topic.
True	False	6.	Anxiety sometimes helps students learn and perform more successfully in the classroom.
True	False	7.	Playing video games can enhance children's cognitive development and school achievement.
True	False	8.	The ways in which teachers assess students' learning influence what and how students actually learn.

Following are the correct answers to each item, along with an explanation regarding *why* it is true or false.

1. *Some children are predominantly left-brain thinkers, whereas others are predominantly right-brain thinkers.* FALSE. With the development of new medical technologies in recent years, researchers have learned a great deal about how the human brain works and which parts of it specialize in which aspects of human thinking. The two halves, or *hemispheres,* of the brain do seem to have somewhat different specialties, but they continually communicate and collaborate in tackling even the simplest of daily tasks. For all intents and purposes, there's no such thing as left-brain or right-brain thinking (Bressler, 2002; M. I. Posner & Rothbart, 2007; D. J. Siegel, 2012).
2. *Children's personalities are largely the results of their home environments.* FALSE. Certainly children's home environments mold their behaviors to some extent. But so, too, do teachers and other people outside the family have considerable influence on children's typical ways of behaving (e.g., Morelli & Rothbaum, 2007). Furthermore, inherited characteristics have a significant impact on children's personalities. From day 1, infants are noticeably different in the extent to which they're calm or

The brain's structure, functioning, and development are discussed in Chapter 2 and in Applying Brain Research features throughout the book.

fussy, shy or outgoing, fearful or adventurous, and attentive or easily distractible. Such differences in *temperament* appear to have their roots in biology and genetics, and they persist throughout the childhood years and into adulthood (Kagan & Snidman, 2007; Keogh, 2003; Rothbart, 2011).

Chapter 3 discusses temperament and personality development.

3. *Instruction is most effective when it is tailored to students' individual learning styles.* FALSE. Contrary to a popular belief, most measures of supposed "learning styles" merely reflect students' self-reported *preferences*, and tailoring instruction to such preferences doesn't noticeably enhance students' learning or academic achievement (Kirschner & van Merriënboer, 2013; Pashler, McDaniel, Rohrer, & Bjork, 2008; Rogowsky, Calhoun, & Tallal, 2015). It is far more important that teachers base their instructional practices on knowledge of the cognitive processes that underlie how virtually *all* students think and learn.

Chapter 5 describes individual differences in cognitive abilities and dispositions that can significantly affect students' learning and academic achievement. Chapter 6 describes general mental processes that underlie effective thinking, learning, and memory.

4. *The best way to learn and remember a new fact is to repeat it over and over.* FALSE. Although repeating information several times is better than doing nothing at all, repetition of specific facts is a relatively *in*effective way to learn. Students learn information more easily and remember it longer when they connect it with things they already know. One especially effective strategy is **elaboration**: using prior knowledge to expand or embellish on a new idea in some way, perhaps by drawing inferences from certain historical facts, identifying new examples of a scientific concept, or thinking of situations in which a mathematical procedure might be helpful (J. R. Anderson, 2005; McNamara & Magliano, 2009; Graesser & Bower, 1990).

Chapter 6 discusses elaboration and its implications for instructional practice.

5. *Students often misjudge how much they know about a topic.* TRUE. Most adults and children are *not* the best judges of what they do and don't know. For example, many students think that if they've spent a long time studying a textbook chapter, they must know its contents very well. Yet if they've spent most of their time studying ineffectively—perhaps by "reading" while thinking about something else altogether or by mindlessly copying definitions—they may know far less than they think they do (N. J. Stone, 2000; Thiede, Griffin, Wiley, & Redford, 2009).

Chapter 7 describes this *illusion of knowing* in more detail.

6. *Anxiety sometimes helps students learn and perform more successfully in the classroom.* TRUE. Many people think that anxiety is always a bad thing. In fact, a *little bit* of anxiety can actually *improve* learning and performance, especially when students perceive a task to be something they can accomplish with reasonable effort. For instance, a small, manageable amount of anxiety can spur students to complete their work carefully and to study for tests (Cassady, 2010b; N. E. Perry, Turner, & Meyer, 2006; D. J. Siegel, 2012).

Chapter 11 explores anxiety's effects in different situations.

7. *Playing video games can enhance children's cognitive development.* TRUE—or more accurately, SOMETIMES TRUE. A great deal of time spent playing video games *instead of* reading, doing homework, and engaging in other school-related activities can definitely interfere with children's long-term academic success. But some video games can be powerful tools for promoting important cognitive abilities. For example, especially within the past two decades, some educational technologists have designed highly motivating video games that simulate real-world problems and foster complex problem-solving skills (D. B. Clark, Tanner-Smith, & Killingsworth, 2016; Granic, Lobel, & Engels, 2014; Plass, Homer, & Kinzer, 2015).

Chapter 7 explores potential benefits of appropriately designed video games.

8. *The ways in which teachers assess students' learning influence what and how students actually learn.* TRUE. We see this principle in action in the opening case study: When Anne Smith's "No D" and multiple-submission policies convey the message that students can't get by with only marginal work, students are more likely to seek feedback about their work, benefit from their mistakes, and enhance their writing skills. *Good* assessments encourage cognitive processes essential for high-quality learning. For example, students are more likely to pull class material into an integrated, meaningful whole

if they expect assessment activities to require such synthesis, and they're more likely to focus on applying what they learn to new situations if they think that assessments will involve application tasks (Carpenter, 2012; Lundeberg & Fox, 1991; Pan, Gopal, & Rickard, 2016; Schraw & Robinson, 2011).

Chapter 14 and Chapter 15 describe various ways in which assessment practices affect students' learning.

How many of the OOPS items did you answer correctly? Did some of the false items seem convincing enough that you marked them true? Did one or more of the true items contradict certain beliefs you had? If either of these was the case, you're hardly alone. College students often agree with statements that seem to be obviously "true," but are, in fact, partially or completely incorrect (Gage, 1991; L. S. Goldstein & Lake, 2000; Woolfolk Hoy, Davis, & Pape, 2006).

It's easy to be persuaded by "common sense" and to assume that what seems logical must be true. Yet common sense and logic don't always give us the real scoop about how people actually learn and develop, nor do they always give us appropriate guidance about how best to help students succeed in classrooms. Thus, much of our knowledge about learning and instruction must come from credible and consistently replicated research findings and from the general principles and theories that those findings support.

Studying and Learning Effectively

1.2 Use effective strategies when you read and study.

As you learn more about educational psychology—and especially as you learn about the nature of human thinking and learning—you'll gain many insights into how you can help students more effectively master classroom subject matter. We authors hope that you'll also gain insights into how *you yourself* can better learn and remember course material. For now, we suggest six general strategies.

You'll learn much more about effective learning and study strategies in upcoming chapters, especially in Chapter 6, Chapter 7, and Chapter 10.

- *Set one or more goals for yourself as you read and study.* Whenever you begin a study session, decide what you want to accomplish during that session, and *be specific*. For example, decide how much new material you want to read on that occasion, how much and in what ways you might review and practice content you've previously learned, or both. The Learning Outcomes you'll see at the beginning of each chapter and at relevant points later on in the chapter can give you some guidance about appropriate goals.
- *Relate what you read to your existing knowledge and prior experiences.* For example, connect new concepts and principles with memorable childhood events, previous course work, or your general knowledge about human beings and their behavior. In general, people learn and remember things more easily and effectively when they engage in **meaningful learning**—that is, when they connect new information and ideas to things they've previously learned.
- *Elaborate on what you read, going beyond it and adding to it.* Earlier in the chapter we mentioned that the process of *elaboration*—embellishing on new information in some way—enhances learning and memory of the information. So try to think *beyond* the information you read. Draw inferences from the ideas presented. Generate new examples of concepts. Identify your own educational applications of various principles of learning, development, and motivation.
- *Actively consider how some new information might contradict your existing beliefs.* As the preceding OOPS test may have shown you, some of what you currently "know"

and believe about learning and instruction may be sort-of-but-not-quite accurate or even entirely *in*accurate. People's existing beliefs can occasionally wreak havoc with new learning. For example, many students in teacher education classes reject research findings that appear to be inconsistent with their personal beliefs and experiences (Fives & Gill, 2015; Gregoire, 2003; Richardson, 2003).

As you read about and study educational psychology, then, think about how some ideas and research findings might actually contradict and discredit your prior "knowledge." When you encounter puzzling or seemingly "wrong" ideas and findings, we hope you'll keep an open mind and, in particular, consider how and why they might have some validity and worth. Ideally, effective learners undergo **conceptual change**: They revise their existing notions to accommodate new and discrepant information.

Chapter 6 explores meaningful learning and conceptual change in greater depth.

- *Tie abstract concepts and principles to concrete examples.* Children become increasingly able to think about abstract ideas as they get older, but people of *all* ages can more readily understand and remember abstract information when they tie it to concrete objects and events. Short examples and lengthier case studies that involve real children and teachers, videos that depict classrooms in action, Experiencing Firsthand exercises such as the OOPS test—all of these can enhance your understanding and memory of new concepts and help you recognize them when you see them in your own work with children and adolescents.

Chapter 2 discusses the development of abstract thinking and other significant cognitive advancements during the school years.

- *Periodically check yourself to make sure you remember and understand what you have read.* There are times when even the most diligent students don't concentrate on what they're reading—when they're actually thinking about something else as their eyes go down the page. So stop once in a while (perhaps once every two or three pages) to make sure you've really learned and understood the things you've been reading. Try to summarize the material. Ask yourself questions about it, and make sure everything makes sense to you. Check your mastery of various concepts by doing activities and taking self-check quizzes sprinkled throughout a chapter. And tackle the Practice for Your Licensure Exam exercise that appears after each chapter summary.

When all is said and done, your overall goal in studying educational psychology shouldn't be to memorize enough facts that you can get good grades on tests and quizzes. Instead, your goal should be to become the best teacher—and also the best *learner*—you can possibly be. As you look forward to your entry into the teaching profession, we urge you to be confident that with time, practice, a solid understanding of how children and adolescents learn and develop, a large toolkit of instructional strategies, and every student's best interests at heart, you can truly make a difference in young people's lives.

Developing as a Teacher

1.3 Develop a long-term plan for gaining expertise as a teacher.

In your first year as a novice teacher, you may initially find your role a bit overwhelming. Virtually any classroom will be one of nonstop action requiring you to be continually attentive and on your toes, and there will always be a great deal to think about.

If you are currently enrolled in a teacher education program, you should think of your program as a very good start on the road to becoming a skillful teacher (Bransford,

Darling-Hammond, & LePage, 2005; Brouwer & Korthagen, 2005). However, it's *only* a start. Developing true expertise in any profession, including teaching, takes many years of experience, although even a single year of teaching experience can make a significant difference (Berliner, 2001; Clotfelter, Ladd, & Vigdor, 2007; Henry, Bastian, & Fortner, 2011). Please be patient with yourself, and recognize that occasionally feeling a bit unsure and making mistakes is par for the course. As you gain experience, you'll gradually become able to make decisions about routine situations and problems quickly and efficiently, giving you the time and energy to think creatively and flexibly about how best to teach classroom subject matter (Borko & Putnam, 1996; Bransford, Derry, Berliner, & Hammerness, 2005; Feldon, 2007).

We can offer you several good strategies for enhancing your teaching expertise—all of them based on research on teacher effectiveness. It's important to note here that most public and private schools *require* teachers to document their ongoing professional growth through such strategies.

- *Keep up to date on research findings and innovations in education.* Additional university coursework and in-service training sessions at your school are two good ways to increase your teaching effectiveness (Desimone, 2009; Hattie, 2009; McDonald, Robles-Piña, & Polnick, 2011). In addition, effective teachers typically subscribe to one or more professional journals, and as time allows, they occasionally attend professional conferences in their area.
- *Learn as much as you can about the subject matter you teach.* When we look at effective teachers—for example, those who are flexible in their approaches to instruction, help students acquire a thorough understanding of classroom topics, and convey obvious enthusiasm for whatever they're teaching—we typically find teachers who know their subject matter extremely well (Borko & Putnam, 1996; Cochran & Jones, 1998; H. C. Hill et al., 2008).
- *Learn as much as you can about specific strategies for teaching your particular subject matter.* In addition to knowing general teaching strategies, it's helpful to acquire strategies specific to the topic you're teaching—strategies that are collectively known as **pedagogical content knowledge**. Effective teachers typically have a large number of strategies for teaching particular topics and skills. Furthermore, they can usually anticipate—and so can also address—the difficulties students will have and the kinds of errors students will make in the process of mastering a skill or body of knowledge (Baumert et al., 2010; Krauss et al., 2008; P. M. Sadler, Sonnert, Coyle, Cook-Smith, & Miller, 2013; L. S. Shulman, 1986).
- *Learn as much as you can about the culture(s) of the community in which you are working.* Students are more likely to do well in school when the school curriculum and classroom environment take their cultural backgrounds into account (Brayboy & Searle, 2007; Moje & Hinchman, 2004; Tyler, Uqdah, et al., 2008). Reading about various cultures can certainly be helpful. But ideally, you can best inform yourself about students' cultural beliefs and practices if you participate in local community activities and converse regularly with community members (Castagno & Brayboy, 2008; McIntyre, 2010).

  At the same time, we urge you *not* to form rigid stereotypes about members of any particular cultural group—or about *any* group of students, for that matter. Yes, it's occasionally helpful to consider **between-group differences**—ways in which members of various cultural groups, economic groups, or genders are apt to be a bit different *on average* with respect to certain characteristics or behaviors. However, you should typically be more aware of **within-group differences**—the many ways in which the individual members of any particular group exhibit characteristics and behaviors unique to themselves.

You can find discussions of between-group differences in many chapters of this book, and especially in Chapter 4. You will find an in-depth discussion of within-group differences—also known as *individual differences*—in Chapter 5.

- *Continually reflect on and critically examine your assumptions, inferences, and teaching practices.* In the opening case study, Anne Smith reflects on her students' performance in previous years and then institutes new assessment policies that she thinks might be more motivating and productive. Like Ms. Smith, effective teachers engage in **reflective teaching**: They continually examine and critique their assumptions, inferences, and instructional practices, and they regularly adjust their beliefs and strategies in the face of new evidence (Hammerness, Darling-Hammond, & Bransford, 2005; T. Hogan, Rabinowitz, & Craven, 2003; Larrivee, 2006).
- *Communicate and collaborate with colleagues.* Effective teachers rarely work in isolation. Instead, they frequently communicate with colleagues in their own school district, across the nation, and, often, in other countries. Furthermore, they regularly coordinate their efforts to enhance students' learning and personal well-being at a schoolwide level (Bransford, Darling-Hammond, et al., 2005; Raudenbush, 2009; Ronfeldt, Farmer, McQueen, & Grissom, 2015). Teacher lounges, email, group text messages, Internet websites, and blogs—all of these provide vehicles for cross-communication and can potentially offer ideas for lesson plans and instructional activities on a wide range of topics. For example, you might look at Smithsonian Education (smithsonianeducation.org), Khan Academy (khanacademy.org), or Open Educational Resources (oercommons.org). You should also look at the websites of professional organizations related to your field; the websites for the National Council of Teachers of Mathematics (nctm.org) and the National Council for the Social Studies (socialstudies.org) are just two of the many possibilities.

  Keep in mind, too, that even the most masterful of teachers had to begin their teaching careers as novices, and they probably entered their first classroom with the same concerns and uncertainties you may initially have. Most experienced teachers are happy to offer you advice and support during challenging times; in fact, they're apt to be flattered that you're asking them! Ideally, teachers and administrators at a single school create a **professional learning community**, in which they share a common vision for students' learning and achievement, work collaboratively to achieve desired outcomes for all students, and regularly communicate with one another about their strategies and progress (DuFour, DuFour, & Eaker, 2008; P. Graham & Ferriter, 2009; Raudenbush, 2009).
- *Believe that you can make a difference in students' lives.* In general, human beings achieve at higher levels in their endeavors when they have high **self-efficacy**—that is, when they believe that they're capable of executing certain behaviors or reaching certain goals. Students are more likely to try to learn something if they believe they *can* learn it—in other words, if they have high self-efficacy. But as a teacher, you, too, must have high self-efficacy. Believing that you can be a good teacher will give you confidence to try new strategies and help you persist in the face of occasional setbacks. Students who achieve at high levels are apt to be those whose teachers have confidence that, *as teachers*, they can make a significant difference as they work both individually in their classrooms and collectively with their colleagues (Holzberger, Philipp, & Kunter, 2013; Skaalvik & Skaalvik, 2008; Zee & Koomen, 2016). Ultimately, what teachers do in the classroom *matters* for students, not only in the short term but for years to come (Hattie, 2009; Konstantopoulos & Chung, 2011).

You can learn more about the nature and effects of self-efficacy in Chapter 10.

Understanding and Interpreting Research Findings

1.4 Draw appropriate conclusions from various kinds of research studies.

As professionals, teachers are *decision makers* who must choose among many, many possible strategies for helping students learn and develop. Certainly teaching is an art to some degree: Good teachers are creative and innovative, and they add many imaginative touches to enhance classroom lessons and activities. But that art must be based on a firm foundation of research findings both about how human beings learn and about how teachers can help them learn effectively; in other words, it must be based on the *science of learning* and the *science of instruction*. Good teaching involves **evidence-based practices**—the use of instructional methods and other classroom strategies that research has consistently shown to bring about significant gains in students' development and academic achievement.

Many research studies involve **quantitative research:** They yield *numbers* that reflect percentages, frequencies, or averages related to certain characteristics or phenomena. For example, a quantitative study might provide information about students' scores on achievement tests, students' responses to rating-scale questionnaires, or school district records of students' attendance and dropout rates.

Other studies involve **qualitative research:** They yield *nonnumeric data*—perhaps in the form of verbal reports, written documents, pictures, videos, or maps—that capture many aspects of a complex situation. For example, a qualitative study might involve one-on-one interviews in which students describe their hopes for the future, a detailed case study of interpersonal relationships within a tight-knit clique of adolescent girls, or in-depth observations of several teachers who create distinctly different psychological atmospheres in their classrooms.

The research study described at the beginning of the chapter is partly a quantitative one: Anne Smith tabulates students' responses to various survey questions and computes the percentages of various final class grades. But when she collects the completed surveys, she also looks closely at students' specific comments and suggestions—qualitative information.

Not all research on learning and instruction is *good* research, of course. Furthermore, people sometimes draw inappropriate conclusions from even the best of research studies. It's important, therefore, that teachers understand what various kinds of research studies can and cannot tell us about learning and instruction.

Quantitative Research

Quantitative research studies vary widely in nature, but you might think of them as falling into four general categories: descriptive, correlational, experimental, and quasi-experimental. These categories yield different kinds of information and warrant different kinds of conclusions.

Descriptive Studies A **descriptive study** does exactly what its name implies: It *describes* a situation. Descriptive studies might give us information about the characteristics of students, teachers, or schools. They might also provide information about how often certain events or behaviors occur. In general, descriptive studies enable us to draw conclusions about the way things are—the current state of affairs.

Correlational Studies A **correlational study** explores *possible associations* among two or more variables. For instance, it might tell us how closely various human characteristics