Educational Psychology

6th Edition

John W. Santrock

Educational Psychology

SIXTH EDITION

John W. Santrock

University of Texas at Dallas

Mc Graw Hill Education

EDUCATIONAL PSYCHOLOGY: *THEORY AND APPLICATION TO FITNESS AND PERFORMANCE, SIXTH EDITION*

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About the **Author**

John Santrock received his Ph.D. from the University of Minnesota. He taught at the University of Charleston and the University of Georgia before joining the Program in Psychology at the University of Texas at Dallas, where he currently teaches a number of undergraduate courses and was recently given the University's Effective Teaching Award. In 2010, he created the UT-Dallas Santrock undergraduate scholarship, an annual award that is given to outstanding undergraduate students majoring in developmental psychology to enable them to attend research conventions.

John has been a member of the editorial boards of *Child Development* and *Developmental Psychology*. His research on father custody is widely cited and used in expert witness testimony to promote flexibility and alternative considerations in custody disputes. John also has authored these exceptional McGraw-Hill texts: *Children* (13th edition), *Adolescence* (16th edition), *A Topical Approach to Life-Span Development* (8th edition), and *Essentials of Life-Span Development* (5th edition).

John Santrock with his grandchildren Luke, Alex, and Jordan.
Courtesy of Dr. John Santrock

For many years, John was involved in tennis as a player, teaching professional, and coach of professional tennis players. At the University of Miami (FL), the tennis team on which he played still holds the NCAA Division I record for most consecutive wins (137) in any sport. John's wife, Mary Jo, has a master's degree in special education and has worked as a teacher and a Realtor. He has two daughters—Tracy, who worked for a number of years as a technology marketing specialist, and Jennifer, who has been a medical sales specialist. However, recently both have followed in their mother's footsteps and are now Realtors. He has one granddaughter, Jordan, age 24, who works for the accounting firm Ernst & Young, and two grandsons, Alex, age 11, and Luke, age 10. In the last two decades, John also has spent time painting expressionist art.

For the educators in my family:
My wife, Mary Jo, a teacher; my father,
John F. Santrock, Jr., a teacher,
principal, and superintendent of
schools; my mother, Ruth Smith
Santrock, an administrative
assistant; my grandmother, Della
Karnes Santrock, who taught
all grades in a one-room
school; and my grandfather,
John F. Santrock, Sr., a principal.

Brief **Contents**

CHAPTER 1 Educational Psychology: A Tool for Effective Teaching 1

CHAPTER 2 Cognitive and Language Development 28

CHAPTER 3 Social Contexts and Socioemotional Development 70

CHAPTER 4 Individual Variations 112

CHAPTER 5 Sociocultural Diversity 142

CHAPTER 6 Learners Who Are Exceptional 181

CHAPTER 7 Behavioral and Social Cognitive Approaches 215

CHAPTER 8 The Information-Processing Approach 251

CHAPTER 9 Complex Cognitive Processes 289

CHAPTER 10 Social Constructivist Approaches 328

CHAPTER 11 Learning and Cognition in the Content Areas 350

CHAPTER 12 Planning, Instruction, and Technology 387

CHAPTER 13 Motivation, Teaching, and Learning 422

CHAPTER 14 Managing the Classroom 462

CHAPTER 15 Standardized Tests and Teaching 498

CHAPTER 16 Classroom Assessment and Grading 531

Contents

Preface xxi

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CHAPTER 1

Educational Psychology: A Tool for Effective Teaching 1

Exploring Educational Psychology 2

Historical Background 2
Teaching: Art and Science 4

Effective Teaching 6

Professional Knowledge and Skills 6
Commitment, Motivation, and Caring 11

SELF-ASSESSMENT 1 *The Best and Worst Characteristics of My Teachers 13*

Research in Educational Psychology 15

Why Research Is Important 15
Research Methods 16
Program Evaluation Research, Action Research, and the Teacher-as-Researcher 21
Quantitative and Qualitative Research 22

CONNECTING WITH THE CLASSROOM: CRACK THE CASE *The Classroom Decision 24*

Connecting with Learning: Reach Your Learning Goals 26

Key Terms 27

Portfolio Activities 27

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CHAPTER 2

Cognitive and Language Development 28

An Overview of Child Development 29

Exploring What Development Is 29
Processes and Periods 29
Developmental Issues 31
Development and Education 34

Cognitive Development 35

The Brain 35
Piaget's Theory 40
Vygotsky's Theory 50

SELF-ASSESSMENT 1 *Applying Piaget and Vygotsky in My Classroom 54*

Language Development 58
What Is Language? 58
Biological and Environmental Influences 59
How Language Develops 59
CONNECTING WITH THE CLASSROOM: CRACK THE CASE *The Book Report 66*
Connecting with Learning: Reach Your Learning Goals 67
Key Terms 69
Portfolio Activities 69

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CHAPTER 3
Social Contexts and Socioemotional Development 70

Contemporary Theories 71
Bronfenbrenner's Ecological Theory 71
Erikson's Life-Span Development Theory 73

Social Contexts of Development 77
Families 77
Peers 82
Schools 84

Socioemotional Development 92
The Self and Identity 92
SELF-ASSESSMENT 1 *Where Are You Now? Exploring Your Identity 96*
Moral Development 97
Emotional Development 104
CONNECTING WITH THE CLASSROOM: CRACK THE CASE *The Fight 108*
Connecting with Learning: Reach Your Learning Goals 109
Key Terms 111
Portfolio Activities 111

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CHAPTER 4
Individual Variations 112

Intelligence 113
What Is Intelligence? 113
Intelligence Tests 114
Theories of Multiple Intelligences 116
SELF-ASSESSMENT 1 *Evaluating Myself on Gardner's Eight Types of Intelligence 121*
The Neuroscience of Intelligence 123
Controversies and Issues in Intelligence 124

Learning and Thinking Styles 130
Impulsive/Reflective Styles 131
Deep/Surface Styles 131
Optimistic/Pessimistic Styles 133
Criticisms of Learning and Thinking Styles 133

Personality and Temperament 134
Personality 134
Temperament 136
CONNECTING WITH THE CLASSROOM: CRACK THE CASE *Workshops 139*
Connecting with Learning: Reach Your Learning Goals 139
Key Terms 141
Portfolio Activities 141

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CHAPTER 5
Sociocultural Diversity 142
Culture and Ethnicity 143
Culture 143
Socioeconomic Status 145
Ethnicity 149
Second-Language Learning and Bilingual Education 151
Multicultural Education 156
Empowering Students 158
Culturally Relevant Teaching 158
Issues-Centered Education 159
Improving Relationships Among Children from Different Ethnic Groups 160
Gender 165
Exploring Gender Views 165
Gender Stereotyping, Similarities, and Differences 166
Gender Controversy 169
Gender-Role Classification 169
SELF-ASSESSMENT 1 *What Gender-Role Orientation Will I Present to My Students? 170*
Gender in Context 171
Eliminating Gender Bias 171
CONNECTING WITH THE CLASSROOM: CRACK THE CASE *These Boys 177*
Connecting with Learning: Reach Your Learning Goals 177
Key Terms 179
Portfolio Activities 180

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CHAPTER 6
Learners Who Are Exceptional 181
Children with Disabilities 182
Learning Disabilities 183
Attention Deficit Hyperactivity Disorder 185
Intellectual Disability 189
Physical Disorders 192
Sensory Disorders 193

Speech and Language Disorders 194
Autism Spectrum Disorders 195
Emotional and Behavioral Disorders 196

SELF-ASSESSMENT 1 *Evaluating My Experiences with People Who Have Various Disabilities and Disorders 197*

Educational Issues Involving Children with Disabilities 200
Legal Aspects 200
Technology 203

Children Who Are Gifted 204
Characteristics 204
Nature/Nurture and Domain-Specific Giftedness 205
Educating Children Who Are Gifted 206

CONNECTING WITH THE CLASSROOM: CRACK THE CASE *Now What? 210*

Connecting with Learning: Reach Your Learning Goals 211

Key Terms 213

Portfolio Activities 214

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CHAPTER 7

Behavioral and Social Cognitive Approaches 215

What Is Learning? 216
What Learning Is and Is Not 216
Approaches to Learning 217

Behavioral Approaches to Learning 218
Classical Conditioning 219
Operant Conditioning 221

Applied Behavior Analysis in Education 224
What Is Applied Behavior Analysis? 224
Increasing Desirable Behaviors 224
Decreasing Undesirable Behaviors 227
Evaluating Operant Conditioning and Applied Behavior Analysis 231

Social Cognitive Approaches to Learning 233
Bandura's Social Cognitive Theory 233
Observational Learning 234

SELF-ASSESSMENT 1 *Models and Mentors in My Life and My Students' Lives 237*

Cognitive-Behavioral Approaches and Self-Regulation 240

SELF-ASSESSMENT 2 *Self-Monitoring 242*

Evaluating the Social Cognitive Approaches 244

CONNECTING WITH THE CLASSROOM: CRACK THE CASE *Consequences 247*

Connecting with Learning: Reach Your Learning Goals 247

Key Terms 250

Portfolio Activities 250

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CHAPTER 8

The Information-Processing Approach 251

The Nature of the Information-Processing Approach 252
The Information-Processing Approach 252
Cognitive Resources: Capacity and Speed of Processing Information 253
Mechanisms of Change 254

Attention 255
What Is Attention? 255
Developmental Changes 256

Memory 260
What Is Memory? 260
Encoding 261
Storage 263
Retrieval and Forgetting 268

Expertise 273
Expertise and Learning 273
SELF-ASSESSMENT 1 *How Effective Are My Memory and Study Strategies? 277*
Acquiring Expertise 278
Expertise and Teaching 278

Metacognition 280
Developmental Changes 280
The Good Information-Processing Model 282
Strategies and Metacognitive Regulation 282
CONNECTING WITH THE CLASSROOM: CRACK THE CASE *The Test 285*

Connecting with Learning: Reach Your Learning Goals 286
Key Terms 288
Portfolio Activities 288

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CHAPTER 9

Complex Cognitive Processes 289

Conceptual Understanding 290
What Are Concepts? 290
Promoting Concept Formation 291

Thinking 296
What Is Thinking? 296
Executive Function 296
Reasoning 298
Critical Thinking 299
Decision Making 304
Creative Thinking 307
SELF-ASSESSMENT 1 *How Good Am I at Thinking Creatively? 308*

Problem Solving 313
Steps in Problem Solving 313
Obstacles to Solving Problems 315

Developmental Changes 315
Problem-Based Learning and Project-Based Learning 316

SELF-ASSESSMENT 2 *How Effective Are My Thinking and Problem-Solving Strategies? 318*

Transfer 320
What Is Transfer? 320
Types of Transfer 320

CONNECTING WITH THE CLASSROOM: CRACK THE CASE *The Statistics Test 324*

Connecting with Learning: Reach Your Learning Goals 325

Key Terms 327

Portfolio Activities 327

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CHAPTER 10

Social Constructivist Approaches 328

Social Constructivist Approaches to Teaching 329
Social Constructivism in the Broader Constructivist Context 329
Situated Cognition 331

Teachers and Peers as Joint Contributors to Students' Learning 332
Scaffolding 332
Cognitive Apprenticeship 332
Tutoring 332
Cooperative Learning 336

Structuring Small-Group Work 342
Composing the Group 342
Team-Building Skills 343
Structuring Small-Group Interaction 343

SELF-ASSESSMENT 1 *Evaluating My Social Constructivist Experiences 345*

CONNECTING WITH THE CLASSROOM: CRACK THE CASE *The Social Constructivist Classroom 347*

Connecting with Learning: Reach Your Learning Goals 348

Key Terms 349

Portfolio Activities 349

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CHAPTER 11

Learning and Cognition in the Content Areas 350

Expert Knowledge and Pedagogical Content Knowledge 351

Reading 352
A Developmental Model of Reading 353
Approaches to Reading 354
Cognitive Approaches 355
Social Constructivist Approaches 356

Writing 359
Developmental Changes 360
Cognitive Approaches 361
Social Constructivist Approaches 362
SELF-ASSESSMENT 1 *Evaluating My Reading and Writing Experiences 364*

Mathematics 367
Developmental Changes 367
Controversy in Math Education 369
Cognitive Processes 369
Some Constructivist Principles 370
Technology and Math Instruction 371

Science 374
Science Education 374
Constructivist Teaching Strategies 375

Social Studies 377
What Is Social Studies? 377
Constructivist Approaches 379
CONNECTING WITH THE CLASSROOM: CRACK THE CASE *The Constructivist Math Curriculum 382*

Connecting with Learning: Reach Your Learning Goals 383
Key Terms 385
Portfolio Activities 386

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CHAPTER 12

Planning, Instruction, and Technology 387

Planning 388
Instructional Planning 388
Time Frames and Planning 389

Teacher-Centered Lesson Planning and Instruction 392
Teacher-Centered Lesson Planning 392
Direct Instruction 395
Teacher-Centered Instructional Strategies 396
Evaluating Teacher-Centered Instruction 401

Learner-Centered Lesson Planning and Instruction 403
Learner-Centered Principles 403
Some Learner-Centered Instructional Strategies 405
Evaluating Learner-Centered Strategies 406

Technology and Education 409
The Technology Revolution and the Internet 410
Standards for Technology-Literate Students 411
Teaching, Learning, and Technology 412
SELF-ASSESSMENT 1 *Evaluating My Technology Skills and Attitudes 416*
CONNECTING WITH THE CLASSROOM: CRACK THE CASE *The Big Debate 418*

Connecting with Learning: Reach Your Learning Goals 419
Key Terms 421
Portfolio Activities 421

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CHAPTER 13

Motivation, Teaching, and Learning 422

Exploring Motivation 423
What Is Motivation? 424
Perspectives on Motivation 424
Achievement Processes 427
Extrinsic and Intrinsic Motivation 427
Attribution 432
Mastery Motivation and Mindset 433
Self-Efficacy 436
Goal Setting, Planning, and Self-Monitoring 437
Expectations 438
Delay of Gratification 439
Values and Purpose 440
Motivation, Relationships, and Sociocultural Contexts 443
Social Motives 444
Social Relationships 444
Sociocultural Contexts 447
Exploring Achievement Difficulties 449
Students Who Are Low Achieving and Have Low Expectations for Success 449
Students Who Protect Their Self-Worth by Avoiding Failure 450
Students Who Procrastinate 451
Students Who Are Perfectionists 452
Students with High Anxiety 452
Students Who Are Uninterested or Alienated 453
SELF-ASSESSMENT 1 *Evaluating My Motivation 456*
CONNECTING WITH THE CLASSROOM: CRACK THE CASE *The Reading Incentive Program 457*
Connecting with Learning: Reach Your Learning Goals 458
Key Terms 461
Portfolio Activities 461

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CHAPTER 14

Managing the Classroom 462

Why Classrooms Need to Be Managed Effectively 463
Management Issues in Elementary and Secondary School Classrooms 464
The Crowded, Complex, and Potentially Chaotic Classroom 465
Getting Off to the Right Start 466
Emphasizing Instruction and a Positive Classroom Climate 467
Management Goals and Strategies 469

Designing the Physical Environment of the Classroom 471
Principles of Classroom Arrangement 471
Arrangement Style 472
Creating a Positive Environment for Learning 474
General Strategies 475
Creating, Teaching, and Maintaining Rules and Procedures 475
Getting Students to Cooperate 478
Classroom Management and Diversity 479
Being a Good Communicator 481
Speaking Skills 481
Listening Skills 483
Nonverbal Communication 484
SELF-ASSESSMENT 1 *Evaluating My Communication Skills 485*
Dealing with Problem Behaviors 487
Management Strategies 487
Dealing with Aggression 490
CONNECTING WITH THE CLASSROOM: CRACK THE CASE *The Chatty Student 494*
Connecting with Learning: Reach Your Learning Goals 495
Key Terms 497
Portfolio Activities 497

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CHAPTER 15

Standardized Tests and Teaching 498

The Nature of Standardized Tests 499
Standardized Tests and Their Purposes 499
Criteria for Evaluating Standardized Tests 500
Aptitude And Achievement Tests 504
Comparing Aptitude and Achievement Tests 504
Types of Standardized Achievement Tests 505
High-Stakes State Standards-Based Tests 505
Standardized Tests of Teacher Candidates 512
The Teacher's Roles 515
Preparing Students to Take Standardized Tests 515
Understanding and Interpreting Test Results 516
SELF-ASSESSMENT 1 *Evaluating My Knowledge of and Skills in Computing Measures of Central Tendency and Variability 520*
Using Standardized Test Scores to Plan and Improve Instruction 522
Issues in Standardized Tests 525
Standardized Tests, Alternative Assessments, and High-Stakes Testing 525
Diversity and Standardized Testing 526
CONNECTING WITH THE CLASSROOM: CRACK THE CASE *The Standardized Test Pressure 527*
Connecting with Learning: Reach Your Learning Goals 528
Key Terms 530
Portfolio Activities 530

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CHAPTER 16

Classroom Assessment and Grading 531

The Classroom as an Assessment Context 532
Assessment as an Integral Part of Teaching 532
Making Assessment Compatible with Contemporary Views of Learning and Motivation 535
Creating Clear, Appropriate Learning Targets 536
Establishing High-Quality Assessments 537
Current Trends 539

Traditional Tests 542
Selected-Response Items 542
Constructed-Response Items 544

Alternative Assessments 547
Trends in Alternative Assessment 547
Performance Assessment 548
Portfolio Assessment 553

SELF-ASSESSMENT 1 *Planning My Classroom Assessment Practices 557*

Grading and Reporting Performance 558
The Purposes of Grading 558
The Components of a Grading System 559
Reporting Students' Progress and Grades to Parents 561
Some Issues in Grading 561

CONNECTING WITH THE CLASSROOM: CRACK THE CASE *The Case of the Project 565*

Connecting with Learning: Reach Your Learning Goals 566

Key Terms 568

Portfolio Activities 568

Glossary G-1
Praxis™ Practice Answer Key P-1
References R-1
Name Index I-1
Subject Index I-10

List of **Features**

SELF-ASSESSMENT

The Best and Worst Characteristics of My Teachers 13
Applying Piaget and Vygotsky in My Classroom 54
Where Are You Now? Exploring Your Identity 96
Evaluating Myself on Gardner's Eight Types of Intelligence 121
What Gender-Role Orientation Will I Present to My Students? 170
Evaluating My Experiences with People Who Have Various Disabilities and Disorders 197
Models and Mentors in My Life and My Students' Lives 237
Self-Monitoring 242
How Effective Are My Memory and Study Strategies? 277
How Good Am I at Thinking Creatively? 308
How Effective Are My Thinking and Problem-Solving Strategies? 318
Evaluating My Social Constructivist Experiences 345
Evaluating My Reading and Writing Experiences 364
Evaluating My Technology Skills and Attitudes 416
Evaluating My Motivation 456
Evaluating My Communication Skills 485
Evaluating My Knowledge of and Skills in Computing Measures of Central Tendency and Variability 520
Planning My Classroom Assessment Practices 557

CONNECTING WITH THE CLASSROOM: CRACK THE CASE

The Classroom Decision 24
The Book Report 66
The Fight 108
Workshops 139
These Boys 177
Now What? 210
Consequences 247
The Test 285
The Statistics Test 324
The Social Constructivist Classroom 347
The Constructivist Math Curriculum 382
The Big Debate 418
The Reading Incentive Program 457
The Chatty Student 494
The Standardized Test Pressure 527
The Case of the Project 565

CONNECTING WITH TEACHERS

Margaret Metzger 2
Donene Polson 29
Keren Abra 71
Shiffy Landa 113
Margaret Longworth 143
Verna Rollins Hayes 182
Ruth Sidney Charney 216
Laura Bickford 252
Marilyn Whirry 290
Chuck Rawls 329
Wendy Nelson Kauffman 351
Lois Guest and Kevin Groves 388
Jaime Escalante 423
Adriane Lonzarich 463
Barbara Berry 499
Vicky Farrow 532

THROUGH THE EYES OF STUDENTS

"You Are the Coolest" 12
A Good Teacher 13
Identity Exploring 97
Jewel Cash, Teen Dynamo 102
It's Okay to Be Different 193
Eyes Closed 193
Children Who Are Gifted Speak 206
"Watch Her, Mom" 225
The Cobwebs of Memory 261
The Thinking Room 296
The 12-Year-Old Filmmaker and Oozy Red Goop 311
The Devl and the Babe Goste 360
Writing Self-Evaluations 363
Hari Prabhakar, Student on a Path to Purpose 440
First Week of School 466
Forensics Teacher Tommie Lindsey's Students 483
It's as if a Test Score Is All There Is to a Person 507
Accepting Responsibility 560

CONNECTING WITH STUDENTS: BEST PRACTICES

Strategies for Becoming an Effective Teacher 14
Strategies for Becoming an Effective Teacher-Researcher 23
Strategies for Working with Preoperational Thinkers 45
Strategies for Working with Concrete Operational Thinkers 46
Strategies for Working with Formal Operational Thinkers 48
Strategies for Applying Piaget's Theory to Children's Education 51
Strategies for Applying Vygotsky's Theory to Children's Education 54
Strategies for Vocabulary Development at Different Developmental Levels 64
Strategies for Educating Children Based on Bronfenbrenner's Theory 73
Strategies for Educating Children Based on Erikson's Theory 76
Strategies for Forging School-Family-Community Linkages 82
Strategies for Improving Children's Social Skills 84
Strategies for Improving Children's Self-Esteem 95
Strategies for Increasing Children's Prosocial Behavior 101
Strategies for Interpreting Intelligence Test Scores 116
Strategies for Implementing Each of Gardner's Multiple Intelligences 120
Strategies for the Use of Tracking 129
Strategies for Working with Impulsive Children 131
Strategies for Helping Surface Learners Think More Deeply 132
Strategies for Teaching Children with Different Temperaments 137
Strategies for Working with Children in Poverty 148
Strategies for Working with Linguistically and Culturally Diverse Children 153
Best Practices and Strategies for Multicultural Education 163
Strategies for Working with Children Who Have Learning Disabilities 186
Strategies for Working with Children Who Have ADHD 190
Strategies for Working with Children Who Have an Intellectual Disability 192
Strategies for Working with Children Who Have a Hearing Impairment 194
Strategies for Working with Children with Disabilities as a Regular Classroom Teacher 202

Strategies for Working with Children Who Are Gifted 208
Strategies for Using Time-Out 229
Best Practices and Strategies for Effectively Using Observational Learning 239
Strategies for Encouraging Students to Be Self-Regulated Learners 245
Strategies for Helping Students Pay Attention 258
Strategies for Helping Students Improve Their Memory 270
Guidelines for Helping Students Use Strategies 284
Strategies for Helping Students Form Concepts 294
Strategies for Improving Children's Thinking 303
Strategies for Making Competent Decisions for Yourself and Your Students 306
Strategies for Guiding Students to Think More Creatively 310
Strategies for Improving Students' Problem Solving 317
Strategies for Helping Students Transfer Information 322
Best Practices and Strategies for Using Peer Tutoring 337
Strategies for Developing Students' Team-Building Skills 344
Strategies for Incorporating Writing into the Curriculum 365
Strategies for Teaching Mathematics 372
Best Practices and Strategies for Teaching Science 375
Strategies for Lecturing 397
Strategies for the Effective Use of Questions 398
Strategies for Using Learner-Centered Instruction 408
Strategies for Choosing and Using Technology in the Classroom 417
Strategies for Student Self-Determination and Choice 428
Strategies for Helping Students Achieve Flow 429
Strategies for Improving Students' Self-Efficacy 437
Strategies for Helping Students Conquer Procrastination 451
Strategies for Helping Students Overcome Their Perfectionist Tendencies 452
Strategies to Reach Uninterested or Alienated Students 453
Strategies for a Good Beginning of the School Year 466
Strategies for Increasing Academic Learning Time 467
Strategies for Designing a Classroom Arrangement 473
Strategies for Being an Effective Classroom Manager 476
Strategies for Establishing Classroom Rules and Procedures 477
Strategies for Guiding Students to Share and Assume Responsibility 479
Strategies for Reducing Bullying 492
Strategies for Improving Students' Test-Taking Skills 517
Strategies for Communicating Test Results to Parents 523
Strategies for Writing Multiple-Choice Items 543
Strategies for Scoring Essay Questions 545
Strategies for Developing Scoring Rubrics 552
Best Strategies for Parent-Teacher Conferences Related to Grades and Assessment 562

Expert Consultants for **Educational Psychology**

Educational psychology has become an enormous, complex field and no single author, or even several authors, can possibly keep up with the rapidly changing content in the main areas of the field. To solve this problem, author John Santrock sought the input of leading experts about content in many different areas of educational psychology. The experts provided detailed evaluations and recommendations for chapter(s) or content in their area(s) of expertise.

The following individuals are among those who served as expert consultants for one or more of the previous editions of this text:

Albert Bandura *Stanford University*
Robert Siegler *Carnegie Mellon University*
Carolyn Evertson *Vanderbilt University*
Michael Pressley *Michigan State University*
Karen Harris *Arizona State University*
Kenji Hakuta *Stanford University*
Joyce Epstein *Johns Hopkins University*
James Kauffman *University of Virginia*
Barbara McCombs *University of Denver*
Donna Ford *Vanderbilt University*
Eric Anderman *Ohio State University*
Micki Chi *Arizona State University*
Daniel Hallahan *University of Virginia*
Susan Goldman *University of Illinois at Chicago*
Allan Wigfield *University of Maryland*
Steven Yussen *University of Minnesota*

The biographies and photographs of the experts for the Sixth Edition of Educational Psychology, who literally are a Who's Who in the field of educational psychology, follow.

Carol Dweck Dr. Dweck is widely recognized as one of the world's leading experts on motivation and achievement. She is Professor of Psychology at Stanford University, having previously been a professor of psychology at Columbia University. Dr. Dweck obtained her Ph.D. in psychology from Yale University. Her research explores the mindsets individuals use to understand themselves and guide their behavior. Dr. Dweck's studies examine the origins of these mindsets, their role in motivation and self-regulation, and their influence on achievement and interpersonal relationships. Dr. Dweck has received numerous awards, including the Thorndike Career Achievement Award in Educational Psychology, the James McKeen Cattell Lifetime Achievement Award, and the Wilbur Cross Medal from Yale University. Her book *Mindset* also has been given many awards and is widely considered to be a major contribution to the field of motivation. Photo courtesy of Carol Dweck

"John Santrock's chapter on motivation is excellent. He presents the different aspects of motivation in a compelling way with lots of practical tips based on state-of-the-art research." —Dr. Carol Dweck

Richard Mayer Dr. Mayer is widely recognized as one of the leading experts on the application of cognitive psychology to children's education. He is Professor of Psychology at the University of California, Santa Barbara (UCSB), where he has served since 1975. Dr. Mayer obtained his Ph.D. in Psychology from the University of Michigan. His current research interests focus on the intersection of cognition, instruction, and technology with a special focus on multimedia learning and computer-supported learning. He has been President of the Division of Educational Psychology of the American Psychological Association, editor of *Educational Psychologist*, co-editor of *Instructional Science*, Chair of the UCSB Department of Psychology, and a recipient of the E. L. Thorndike Award for career achievement in educational psychology. Dr. Mayer has been awarded the Distinguished Contribution of Applications of Psychology to Education and Training Award from the American Psychological Association and has been ranked as the most productive educational psychologist by *Contemporary Educational Psychology*. He has been Vice President for Division C (Learning and Instruction) of the American Educational Research Association and is on the editorial boards of 12 journals, mainly in educational psychology. He has been the Principal Investigator or co-PI on more than 30 grants. Dr. Mayer has served on a local school board in Goleta, California, since 1981. He is the author or editor of more than 500 publications, including 30 books, such as *Computer Games for Learning, Multimedia Learning* (2nd ed.), *Handbook of Learning and Instruction* (2nd ed.) (with Patricia Alexander), *E-Learning and the Science of Instruction* (with R. Clark), *Cambridge Handbook of Multimedia Learning*, and *Applying the Science of Learning*. Photo courtesy of Richard Mayer

"I enjoyed reading the chapters and appreciate the coverage given to cognitive topics in the book. Dr. Santrock's book is recognized as a leading educational psychology textbook. . . . The coverage of the topics is appropriate and up-to-date, the writing style is clear and friendly, and the book makes good connections to practical educational issues." —Dr. Richard Mayer

Kirsten Butcher A leading expert on technology and education, Dr. Butcher is Director of the Center for the Advancement of Technology in Education in the Department of Education at the University of Utah. Dr. Butcher also is Director of the Instructional Design and Educational Technology program at the University of Utah and a professor in the Department of Educational Psychology the University. She obtained her

Ph.D. from the University of Colorado–Boulder. Dr. Butcher's work focuses on how well-designed, interactive technologies can support students' higher-level cognitive processing of information in areas such as integration, inference, and transfer. Photo courtesy of Kristen R. Butcher

"This text provides an excellent overview of the concepts and concerns essential to modern educators. Dr. Santrock moves seamlessly between theory and practice for a thorough introduction to contemporary instruction. His text covers the essential concepts and approaches to effective instruction for 21st century educators." —Dr. Kirsten Butcher

Dale Schunk Dr. Schunk is one of the world's leading experts on children's learning and motivation in educational settings. He is Dean of Education and Professor of Curriculum at the University of North Carolina–Greensboro. Dr. Schunk obtained his Ph.D. from Stanford University and previously was on the faculty at the University of Houston, University of North Carolina–Chapel Hill, and Purdue University (where he was head of the Department of Educational Studies). He has published over 100 articles and chapters, is the author of *Learning Theories: An Educational Perspective* (7th ed.), co-author of *Academic Self-Efficacy* (with Maria DiBenedetto), and co-author of *Motivation in Education* (4th ed.) (with Judith Meece and Paul Pintrich). Photo courtesy of Dale Schunk

"John Santrock's text provides excellent coverage of major motivational theories and applications to educational contexts. Student activities (such as Praxis® questions, self-reflections) and reviews are very helpful . . . strong section on motivation. . . . Very clearly written—will be easily understood by undergraduates. The chapter on motivation, teaching, and learning reviews current theories and research on key motivational topics with high relevance to education. . . . There are lots of specific applications to different types of students, which students will appreciate. It is nice to see the coverage of social motivation, as this topic often is minimized in favor of motivation for academic learning." —Dr. Dale Schunk

Kathryn Wentzel Dr. Wentzel is a leading expert on the social aspects of motivation and achievement. She is Professor of Human Development in the Department of Human Development, Learning, and Quantitative Methods at the University of Maryland. Dr. Wentzel obtained her Ph.D. in Psychological Studies in Education at Stanford University, after which she held post-doctoral positions at Stanford and the University of Illinois. Her research focuses on the social aspects of children's and adolescents' motivation and achievement. She has published more than 100 articles and book chapters and co-edited a number of books, including *Handbook of Motivation at School* (2nd ed.) and *Handbook of Social Influences in School Contexts.* Dr. Wentzel is currently editor of *Educational Psychology* and past editor of *Journal of Applied Developmental Psychology.* Photo courtesy of Dr. Kathryn Wentzel

"I enjoyed reading the chapters (3, Social Contexts and Socioemotional Development, and 13, Motivation, Teaching, and Learning) and think they are in great shape. My comments are mostly for 'fine tuning'. . . . This is a well-written and comprehensive introductory chapter on social contexts and socioemotional development as they pertain to schooling. The chapter on motivation does a very good job of covering current work in the field. . . . I especially liked the teachers' quotes throughout." —Kathryn Wentzel

Bill Howe Dr. Howe is a leading expert on diversity and multicultural education. He has been education consultant for multicultural education, gender equity, and civil rights at the Connecticut State Department of Education. He is Past President of the National Association for Multicultural Education. Dr. Howe is the founder of the New England Conference on Multicultural Education. He serves on the boards of a number of organizations, including the STEM National Advisory Board, Advisory Board for Native Village, Asian Pacific American Coalition of CT (APAC), and Advisory Board for International Educational Resources at Yale University. In recent years, Dr. Howe has trained more than 15,000 educators in multicultural education. Dr. Howe recently co-authored *Becoming a Multicultural Educator* (2nd ed.). Photo courtesy of William Howe

"No topics covered should be omitted. . . . I enjoyed reading this text and learned a lot from reading it. . . . I like the format. I like the practical suggestions as they pertain to teaching and learning. . . . Above all, I like the writing style. It is user-friendly. . . . I find this text helpful in that it has many great applicable suggestions." —Dr. Bill Howe

James McMillan A leading expert on educational assessment, Dr. McMillan is Professor of Educational Foundations at Virginia Commonwealth University. Dr. McMillan obtained his Ph.D. at Northwestern University. He has authored a number of books on educational assessment, including *Fundamentals of Education Research* (7th ed.) and *Classroom Assessment* (6th ed.). Dr. McMillan has published extensively in leading educational journals, including *Educational Psychology, Educational Measurement,* and *American Educational Research Journal.* His current research focuses on how students' mistakes and learning errors can facilitate motivation, self-regulation, study skills, and subsequent achievement. Dr. McMillan recently was given his university's School of Education teaching award. He also has been active in Virginia's state testing and accountability program. Photo courtesy of James McMillan

"The strength of these chapters (1, Introduction, 15, Standardized Tests and Teaching, and 16, Classroom Assessment and Grading) is on identifying issues that can be used for further research and discussion. There is good coverage of essential topics. The connection to Praxis is excellent. I also like the portfolio section at the end of each chapter." —Dr. James McMillan

Preface

It is gratifying that the first five editions of *Educational Psychology* have been so well received. Preparing the sixth edition has been both highly rewarding and challenging: rewarding because I continue to learn so much more about educating students and because the feedback from students and instructors has been consistently enthusiastic; a challenge because of the need to continue meeting or exceeding instructors' expectations and ensure that the material is fresh and up to date.

One of my goals for each edition of *Educational Psychology* has been to write a book that students say this about:

> *"I love this book."*
>
> *"I am using many of the ideas from my educational psychology text in my teaching and they are working great!"*
>
> *"I teach in the inner city and my educational psychology text is a great resource for me. The focus on diversity and technology have been extremely useful. I am enriched by the book."*

These comments come from Jennifer Holliman-McCarthy, Richard Harvell, and Greg Hill, who have used this text in their educational psychology course and gone on to become public school teachers.

Another goal I have had for each edition of *Educational Psychology* has been to write a book that instructors say this about:

> *"I wasn't prepared to like this text. In general, ed psych texts are all too predictable. While people claim to be innovative, in the end they are not. In contrast, John Santrock's text is a big WOW! His book is different. It is written for the prospective teacher and not the future educational psychologist."*
>
> *"Those who are not using Santrock have not seen it. Please communicate my sincere enjoyment of this quality text to John Santrock."*

These comments come from educational psychology instructors Randy Lennon, University of Northern Colorado, and Robert Brown, Florida Atlantic University–Boca Raton.

CONNECTING THEORY AND PRACTICE

I've been teaching an undergraduate educational psychology course every year for the last two decades. Each year I ask the students to tell me what they like about the course and the text, and what they think could be improved. Over the many years of teaching the course and different editions of this text, I have incorporated many of these suggestions in the text.

What have my students told me lately about my course and text? Recently, McGraw-Hill has embarked on an effort to emphasize connections in learning and teaching. In talking with students in the course about the connections theme, it became clear that a *Connections* theme would enhance the effectiveness of connecting theory and practice. Four aspects of the text that emphasize this connection are: (1) Connecting with Teachers, (2) Connecting with Students: Best Practices, (3) Connecting with Development, and (4) Connecting with the Classroom: Crack the Case.

Connecting with Teachers

Each chapter opens with a high-interest teaching story that is linked to the chapter's content. Many of these stories were written especially for this text by outstanding teachers.

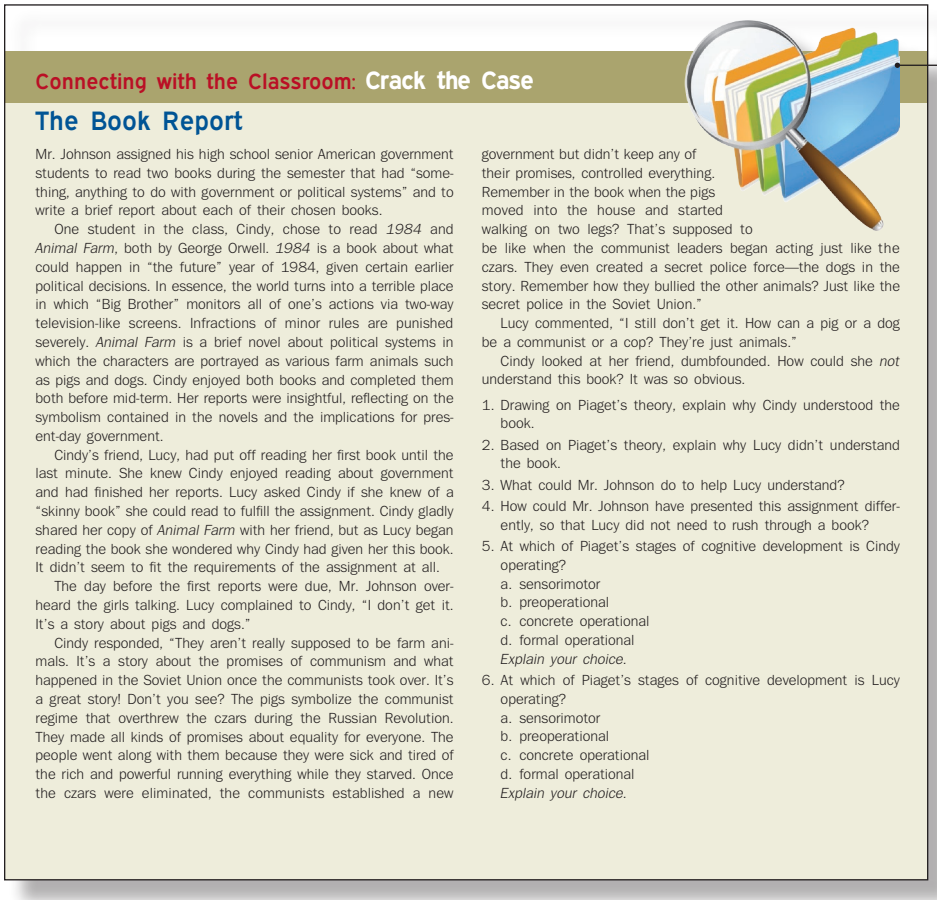
Connecting with Students: Best Practices

A feature formerly titled *Connecting with Teachers: Best Practices* that appears numerous times in each chapter is now titled *Connecting with Students: Best Practices.* I am especially indebted to many outstanding teachers for the examples they provided for the *Connecting with Students* material that connects theory and practice.

Another feature, ***Through the Eyes of Teachers,*** is embedded in *Connecting with Students: Best Practices*, presenting the strategies that leading teachers—many of them award-winning—use related to the topic(s) that have just been discussed.

Connecting with Development

Prospective teachers who take a course in developmental psychology will be teaching at different grade levels. They want to better understand developmental changes in students and the best way to teach students at the grade level at which they will teach. I asked a number of outstanding teachers at four different levels of schooling (early childhood, elementary school, middle school, and high school) to provide their recommendations of the best teaching practices related to the topic being discussed at that point in the text. Their comments appear multiple times within chapters.



Connecting with the Classroom: Crack the Case

The Book Report

Mr. Johnson assigned his high school senior American government students to read two books during the semester that had "something, anything to do with government or political systems" and to write a brief report about each of their chosen books.

One student in the class, Cindy, chose to read *1984* and *Animal Farm*, both by George Orwell. *1984* is a book about what could happen in "the future" year of 1984, given certain earlier political decisions. In essence, the world turns into a terrible place in which "Big Brother" monitors all of one's actions via two-way television-like screens. Infractions of minor rules are punished severely. *Animal Farm* is a brief novel about political systems in which the characters are portrayed as various farm animals such as pigs and dogs. Cindy enjoyed both books and completed them both before mid-term. Her reports were insightful, reflecting on the symbolism contained in the novels and the implications for present-day government.

Cindy's friend, Lucy, had put off reading her first book until the last minute. She knew Cindy enjoyed reading about government and had finished her reports. Lucy asked Cindy if she knew of a "skinny book" she could read to fulfill the assignment. Cindy gladly shared her copy of *Animal Farm* with her friend, but as Lucy began reading the book she wondered why Cindy had given her this book. It didn't seem to fit the requirements of the assignment at all.

The day before the first reports were due, Mr. Johnson overheard the girls talking. Lucy complained to Cindy, "I don't get it. It's a story about pigs and dogs."

Cindy responded, "They aren't really supposed to be farm animals. It's a story about the promises of communism and what happened in the Soviet Union once the communists took over. It's a great story! Don't you see? The pigs symbolize the communist regime that overthrew the czars during the Russian Revolution. They made all kinds of promises about equality for everyone. The people went along with them because they were sick and tired of the rich and powerful running everything while they starved. Once the czars were eliminated, the communists established a new government but didn't keep any of their promises, controlled everything. Remember in the book when the pigs moved into the house and started walking on two legs? That's supposed to be like when the communist leaders began acting just like the czars. They even created a secret police force—the dogs in the story. Remember how they bullied the other animals? Just like the secret police in the Soviet Union."

Lucy commented, "I still don't get it. How can a pig or a dog be a communist or a cop? They're just animals."

Cindy looked at her friend, dumbfounded. How could she *not* understand this book? It was so obvious.

1. Drawing on Piaget's theory, explain why Cindy understood the book.
2. Based on Piaget's theory, explain why Lucy didn't understand the book.
3. What could Mr. Johnson do to help Lucy understand?
4. How could Mr. Johnson have presented this assignment differently, so that Lucy did not need to rush through a book?
5. At which of Piaget's stages of cognitive development is Cindy operating?
   a. sensorimotor
   b. preoperational
   c. concrete operational
   d. formal operational
   Explain your choice.
6. At which of Piaget's stages of cognitive development is Lucy operating?
   a. sensorimotor
   b. preoperational
   c. concrete operational
   d. formal operational
   Explain your choice.

Connecting with the Classroom: Crack the Case

At the end of each chapter is a full-page case study related to the chapter's content. The case study provides students an opportunity to apply what they have learned in the chapter to a real-world teaching issue or problem. At the end of the case study, students are asked a series of questions—in some cases, PRAXIS-type multiple-choice items—that encourage them to reflect on and think critically about the case.

Extensive Examples of Teaching Throughout the Text

Teaching examples and strategies are embedded throughout the text. For virtually every main topic, introduction of a new concept is followed by examples and strategies for best teaching practices.

RESEARCH UPDATING

In the introductory chapter, the question of whether education is art or science is addressed, and the generally agreed-upon answer is "both." Thus, the sixth edition of *Educational Psychology* incorporates a strong research base for many topics.

Recent Content and Research

The sixth edition of *Educational Psychology* presents the latest content and research, including more than 1,000 citations from 2014 to 2017. Later in the Preface I will highlight the main content and research additions on a chapter-by-chapter basis.

Expert Content and Research Consultants

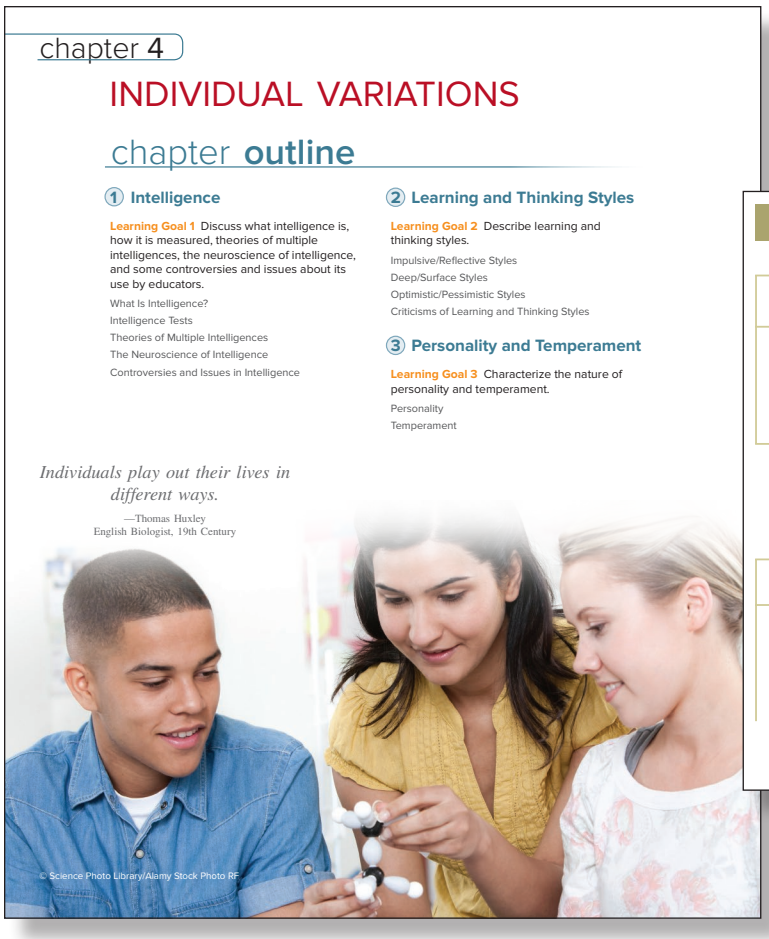
Educational psychology has become such an enormous, complex field that no single author, or even several authors, can possibly be an expert in many different areas. To solve this problem, I have sought the input of leading experts in many different areas of educational psychology. The experts provided me with detailed evaluations of the first draft of the sixth edition and recommendations in their area(s) of expertise. The collective expertise of the consultants on the first five editions and on the new sixth edition have immensely improved the quality of this text.

The expert consultants for the sixth edition of *Educational Psychology*, whose photographs and biographies appear on pages xix and xx, are Carol Dweck, Richard Mayer, Kirsten Butcher, Dale Schunk, Kathryn Wentzel, Bill Howe, and James McMillan.

THE LEARNING SYSTEM

Now more than ever, students struggle to find the main ideas in their courses, especially in courses like educational psychology that include so much material. The learning system I have developed for *Educational Psychology* provides extensive learning connections throughout the chapter.

The learning system connects the chapter opening outline, learning goals for the chapter, mini-chapter maps that open each main section of the chapter, a *Review*,


chapter 4

INDIVIDUAL VARIATIONS

chapter outline

1 Intelligence

Learning Goal 1 Discuss what intelligence is, how it is measured, theories of multiple intelligences, the neuroscience of intelligence, and some controversies and issues about its use by educators.

What Is Intelligence?
Intelligence Tests
Theories of Multiple Intelligences
The Neuroscience of Intelligence
Controversies and Issues in Intelligence

2 Learning and Thinking Styles

Learning Goal 2 Describe learning and thinking styles.

Impulsive/Reflective Styles
Deep/Surface Styles
Optimistic/Pessimistic Styles
Criticisms of Learning and Thinking Styles

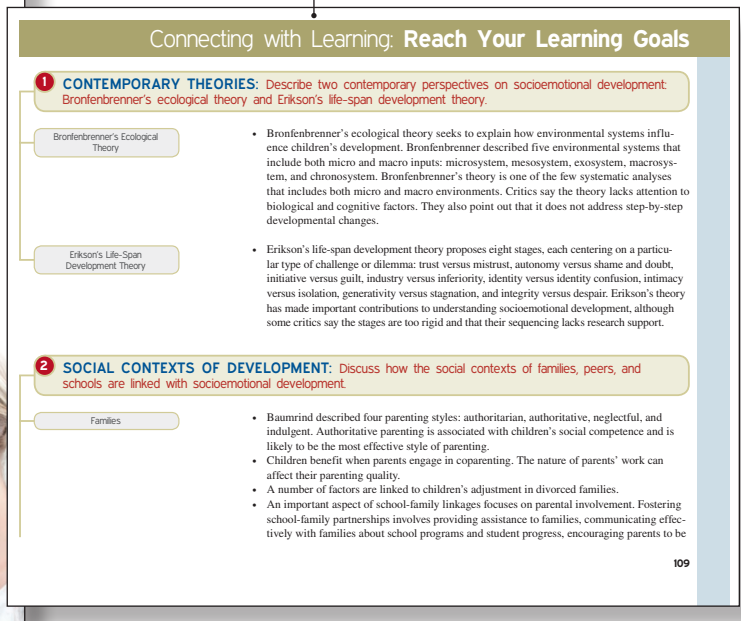
3 Personality and Temperament

Learning Goal 3 Characterize the nature of personality and temperament.

Personality
Temperament

Individuals play out their lives in different ways.

—Thomas Huxley
English Biologist, 19th Century


Connecting with Learning: **Reach Your Learning Goals**

1 **CONTEMPORARY THEORIES:** Describe two contemporary perspectives on socioemotional development: Bronfenbrenner's ecological theory and Erikson's life-span development theory.

Bronfenbrenner's Ecological Theory

- Bronfenbrenner's ecological theory seeks to explain how environmental systems influence children's development. Bronfenbrenner described five environmental systems that include both micro and macro inputs: microsystem, mesosystem, exosystem, macrosystem, and chronosystem. Bronfenbrenner's theory is one of the few systematic analyses that includes both micro and macro environments. Critics say the theory lacks attention to biological and cognitive factors. They also point out that it does not address step-by-step developmental changes.

Erikson's Life-Span Development Theory

- Erikson's life-span development theory proposes eight stages, each centering on a particular type of challenge or dilemma: trust versus mistrust, autonomy versus shame and doubt, initiative versus guilt, industry versus inferiority, identity versus identity confusion, intimacy versus isolation, generativity versus stagnation, and integrity versus despair. Erikson's theory has made important contributions to understanding socioemotional development, although some critics say the stages are too rigid and that their sequencing lacks research support.

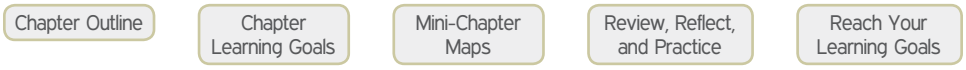
2 **SOCIAL CONTEXTS OF DEVELOPMENT:** Discuss how the social contexts of families, peers, and schools are linked with socioemotional development.

Families

- Baumrind described four parenting styles: authoritarian, authoritative, neglectful, and indulgent. Authoritative parenting is associated with children's social competence and is likely to be the most effective style of parenting.
- Children benefit when parents engage in coparenting. The nature of parents' work can affect their parenting quality.
- A number of factors are linked to children's adjustment in divorced families.
- An important aspect of school-family linkages focuses on parental involvement. Fostering school-family partnerships involves providing assistance to families, communicating effectively with families about school programs and student progress, encouraging parents to be

109

Reflect, and Practice feature at the end of each main section, and a chapter summary at the end of each chapter—*Connecting with Learning: Reach Your Learning Goals:*



The learning system keeps the key ideas in front of the student from the beginning to the end of the chapter. Each chapter has no more than five main headings and corresponding learning goals, which are presented in the chapter-opening spread. Mini-chapter maps that link up with the learning goals are presented at the beginning of each major section in the chapter. Then, at the end of each main section of a chapter, the learning goal is repeated in the "Review, Reflect, and Practice" feature, which prompts students to review the key topics in the section and poses a question to encourage them to think critically about what they have read, and as indicated earlier, in many cases how they will incorporate the material into their own teaching. At the end of the chapter, under the heading "Reach Your Learning Goals," the learning goals guide students through the bulleted chapter review, connecting with the chapter outline at the beginning of the chapter and the "Review, Reflect, and Practice" feature at the end of major chapter sections.

At the end of each chapter, Portfolio Activities related to the chapter's content are presented. They are organized into three categories for instructors' ease of use: Independent Reflection, Research/Field Experience, and Collaborative Work. Each Portfolio Activity is coded to a specific INTASC standard.

MAIN CHAPTER-BY-CHAPTER CHANGES

Following are the main chapter-by-chapter content changes that were made in this new edition of *Educational Psychology.*

CHAPTER 1
EDUCATIONAL PSYCHOLOGY: A TOOL FOR EFFECTIVE TEACHING

- New coverage of the Common Core State Standards Initiative (2016) under the topic of assessment of students' knowledge and skills
- New description of Every Student Succeeds Act, which was passed into law in December 2015. This law replaced No Child Left Behind and will be fully implemented in the 2017–2018 school year. Although the law doesn't totally eliminate testing to evaluate student success, it does require other factors to be included and reduces the number of tests students are given (Rothman, 2016).
- New coverage of the recently revised technology standards for students crafted by the International Society for Technology in Education (ISTE, 2016)
- Expanded content on technological skills to include the dramatic increase in students' screen time, media multitasking, and social media use, and how this use of time can influence their academic and socioemotional development (Branscum & Crowson, 2016; Wu & others, 2016)
- New section on physiological measures such as magnetic resonance imaging, heart rate monitoring, and assessment of hormones such as cortisone (Galvan & Tottenham, 2016; Jacoby & others, 2016; Johnson, 2016)
- New discussion of the increasing capability of researchers to assess actual genes and explore how genetic and environmental factors influence many education-related topics including intelligence, ADHD, autism, and many others (Grigorenko & others, 2016; Hill & Roth, 2016)

CHAPTER 2
COGNITIVE AND LANGUAGE DEVELOPMENT

- New coverage of emerging adulthood, the transitional period between adolescence and adulthood that occurs from approximately 18 to 25 years of age (Arnett, 2012, 2015)
- New discussion of the epigenetic view of development and the increasing research on gene x environment interaction (Burt, Coatsworth, & Masten, 2016; Hill & Roth, 2016)
- New commentary about how environmental experiences can modify genetic expression and inclusion of several examples to illustrate this concept
- New description of the neuroconstructivist view of the nature of the brain's development (de Haan & Johnson, 2016)

- New content on the view that the prefrontal cortex likely orchestrates the functions of many other brain regions during development (de Haan & Johnson, 2016)
- Expanded and updated coverage of developmental changes in the brain during adolescence including the limbic system's role (Monahan & others, 2016)
- Updated discussion of the Computer Clubhouse Network and new description of the computational thinking movement, including connection to an ISTE Web site where students can see a video on the importance of students learning how computers work
- New content on whether social media might serve as an amplification tool for adolescent egocentrism and coverage of a recent study that found Facebook use increases self-interest (Chiou, Chen, & Liao, 2014)
- Inclusion of six principles identified by Kathy Hirsh-Pasek and her colleagues (Harris, Golinkoff, & Hirsh-Pasek, 2011; Hirsh-Pasek & Golinkoff, 2016) for improving children's vocabulary development
- Expanded and updated coverage of the use of technology to support children's vocabulary development, as well as access to the National Council of Teachers of English's Web site that has a wide range of strategies for effective teaching of reading and writing

CHAPTER 3
SOCIAL CONTEXTS AND SOCIOEMOTIONAL DEVELOPMENT

- New section, "Parental Involvement in Students' Schooling and Achievement," including a recent study that found positive academic outcomes for such involvement, as well as different outcomes for students from low- and high-SES families depending on the particular type of involvement (Benner, Boyle, & Sadler, 2016)
- Inclusion of recent research indicating that cooperative coparenting between divorced spouses was linked to children having fewer adjustment problems (Lamela & others, 2016)
- Description of a recent study in which having friends who engaged in delinquency was associated with early onset and more persistent delinquency (Evans, Simons, & Simons, 2016)
- Updated information about the dramatic increase in Montessori schools in the United States and the estimated number worldwide (North American Montessori Teachers' Association, 2016)
- Revised and updated discussion of Project Head Start, including recent research showing mixed results for Head Start (Lee & others, 2014; Miller, Farkas, & Duncan, 2016)
- Inclusion of recommendations by Kathy Hirsh-Pasek and her colleagues (2015) on how to evaluate which educational apps for children to use and which to avoid
- Greatly expanded discussion of high school education, including problems in making the transition to high school (Eccles & Roeser, 2015)
- New description of Robert Crosnoe's (2011) book, *Fitting In, Standing Out,* that focuses on how the social aspects of adolescents' lives can undermine their academic success
- Updated statistics on high school dropout rates (National Center for Education Statistics, 2016) and commentary on how dropout rates are much higher in some contexts such as poverty areas of inner cities
- Updates on the initiatives now being funded by the Bill and Melinda Gates Foundation (2016) that involve creating a new generation of courseware that adapts to students' learning needs and using digital tools to help students learn in independent ways
- Coverage of a recent study in which immigrant adolescents who participated in extracurricular activities improved their academic achievement and increased their school engagement (Camacho & Fuligni, 2015)
- Coverage of two recent studies that found a strongly positive ethnic identity was linked to a lower incidence of substance abuse and psychiatric problems (Anglin & others, 2016; Grindal & Nieri, 2016)
- New discussion of the role of emotions in moral development
- New section on the increasingly important domain theory of moral development (Killen & Smetana, 2015; Turiel, 2015)
- Updated information about teen dynamo Jewel Cash in the service learning section
- New main section, "Emotional Development," that describes what emotions are, how they develop, and ways to improve children's emotional development (Calkins & Perry, 2016)
- Expanded commentary about children's ability to cope with the stress of a disaster (Ungar, 2015)
- New section, "Social-Emotional Education Programs," that describes two increasingly implemented programs: (1) Second Step (Committee for Children, 2016) and (2) CASEL (2016)

CHAPTER 4
INDIVIDUAL VARIATIONS

- Discussion of Robert Sternberg's (2014) recent definition of intelligence as the ability to adapt to, shape, and select environments
- Updated versions of the Wechsler intelligence scales
- Extensively updated and expanded discussion of technologies that teachers can use related to Gardner's eight multiple intelligences based on leading expert Kirsten Butcher's recommendations

- Inclusion of Robert Sternberg's (2014) commentary about how research on the brain's role in intelligence has produced more answers to some questions than to others
- Discussion of a recent study in which emotional intelligence abilities were linked to academic achievement above and beyond cognitive and personality factors (Lanciano & Curci, 2014)
- Coverage of a recent study that found children who were gifted engaged in faster and more accurate processing of information than did children who were not gifted (Duan, Dan, & Shi, 2013)
- Inclusion of research that revealed a 12- to 18-point increase in IQ when children were adopted from low-income families into middle- and upper-income families (Nisbett & others, 2012)
- Description of a recent meta-analysis of 53 studies since 1972 that found IQ scores have been rising about 3 points per decade since that year and that the increase in IQ scores does not seem to be diminishing (Trahan & others, 2014)
- Description of a recent study using Stanford Binet intelligence scales that found no differences between non-Latino White and African American preschool children when they were matched for age, gender, and level of parent education (Dale & others, 2014)
- Description of a recent meta-analysis that revealed a correlation of +.54 between intelligence and school grades (Roth & others, 2015)
- Coverage of a recent analysis that concluded the underrepresentation of African Americans in STEM subjects and careers is linked to practitioners' expectations that they have less innate talent than non-Latino Whites (Leslie & others, 2015)
- Update on the success of AVID programs in improving academic achievement of high school and college students (Huerta & Watt, 2015)
- New section on optimistic/pessimistic thinking styles, including the concept of academic optimism and its link to student success
- Coverage of two recent research reviews concluding that insufficient scientific evidence exists to support theories about learning styles (Cuevas, 2015; Willingham, Hughes, & Dobolyi, 2015)
- Updated discussion of the "Big Five" personality factors (Hill & Roberts, 2016), including recent research linking conscientiousness to better academic achievement and health (Rosander & Backstrom, 2014; Pluess & Bartley, 2015)
- New content on the personality trait of conscientiousness being the best predictor of academic achievement and openness to experience the second best (Poropat, 2016)
- New discussion of describing temperament in terms of reactivity and self-regulation (Bates & Pettit, 2015)
- New research that revealed effortful control was a strong predictor of academic success skills in kindergarten children from low-income families (Morris & others, 2013)
- Revised description of Rothbart and Bates' extraversion/surgency category of temperament

CHAPTER 5
SOCIOCULTURAL DIVERSITY

- Extensive updating and expansion of technology resources teachers can use related to culture and diversity based on leading expert Kirsten Butcher's recommendations
- Coverage of a longitudinal study from 1970 to 2008 which found that although China is still characterized by collectivistic values, words that index individualistic values are being used with increasing frequency in China (Zeng & Greenfield, 2015)
- Updated statistics on the recent increase in the percentage of U.S. children and adolescents under 18 years of age living in poverty, including data reported separately for African American and Latino families, as well as new poverty data based on educational attainment (DeNavas-Walt & Proctor, 2015)
- Coverage of recent research by Sonja Luthar and her colleagues (2013) in which youth in upwardly mobile, upper-middle SES families are more likely to take drugs and have more internalized and externalized problems that their counterparts in middle-SES families
- Updated research on the Quantum Opportunities program in which participants in the program had higher grade point averages, were more likely to graduate from high school, and were more likely to go to college than a control group of students not enrolled in the program (Curtis & Bandy, 2016)
- New coverage of the Ascend two-generation poverty intervention and its effort to improve the school success of students living in poverty (King, Chase-Lansdale, & Small, 2015)
- Description of a recent intervention program (the Positive Action program) that was assessed from the third to eighth grades in 14 schools in low-income areas of Chicago (Lewis & others, 2013). Compared with a control group, students in the intervention program engaged in a lower rate of violence-related behavior and received fewer disciplinary referrals and school suspensions.
- Discussion of a recent study of more than 500 high school students living in low-income areas of Los Angeles who were selected through a random admissions lottery to attend high-performing charter schools, which resulted in the students doing better on standardized tests of math and English and being less likely to drop out of school (Wong & others, 2014)

- Updated data on the dramatic increase in Latino and Asian American children in the United States, with recent projections from 2014 to 2060 (Colby & Ortman, 2015)
- Inclusion of a recent study in which ethnic minority students in grades 3 through 10 who were matched with a teacher of their ethnicity showed small but positive gains in academic achievement in reading and math (Egalite, Kisida, & Winters, 2015)
- Substantially updated and expanded discussion of the role that technology can play in students' understanding and exploration of culture and diversity, including connections to Web sites involving videoconferencing, the Global Student Laboratory Project, the First Lego League, Mystery Skype, and Microsoft's Web site for finding guest speakers for a classroom
- New description of the rate at which bilingual and monolingual children learn language(s) (Hoff, 2016) and inclusion of a recent study that found by 4 years of age children who continued to learn Spanish and English languages had a total vocabulary growth that was greater than that of monolingual children (Hoff & others, 2014)
- New commentary about how teaching infants and young children two languages simultaneously has numerous benefits and few drawbacks (Bialystok, 2014, 2015)
- Updated content on the gender difference favoring males in specific science courses and attitudes toward science (Cunningham, Hoyer, & Sparks, 2015)
- Updated data on gender differences and similarities in math and reading for the National Assessment of Educational Progress (2015) and the SAT (The College Board, 2015), as well as for writing on the SAT (The College Board, 2015)
- New commentary about the multiple factors that may contribute to gender differences in academic achievement in areas such as math, science, reading, and writing (Klug, 2016; Wentzel & Miele, 2016)
- Recent research and conclusions about gender differences in relationship skills (Leaper, 2015)
- Updated coverage of gender and relational aggression
- Discussion of recent research on gender and emotion (Leaper, 2015), including recent research reviews indicating that girls show more positive emotions and more internalized emotions (Chaplin & Aldao, 2013)
- Extensive updating of recent research on single-sex schooling and recent content on the dramatic increase in single-sex public schools (Barbarin, Chinn, & Wright, 2014; Huston, 2015; Liben, 2015)
- Inclusion of recent data on the dramatic increase in females participating in secondary school athletics in recent years (Child Trends Data Bank, 2015)
- Inclusion of results from a national survey of various aspects of relationship and sexual abuse in adolescents (Taylor & Mumford, 2016)

CHAPTER 6
LEARNERS WHO ARE EXCEPTIONAL

- Updated statistics on the percentage of U.S. children who have different types of disabilities and update of Figure 1 (National Center for Education Statistics, 2016)
- Updated statistics on the percentage of U.S. children who have ever been diagnosed with ADHD (American Psychiatric Association, 2013; Centers for Disease Control and Prevention, 2016)
- New research that revealed the dopamine transporter gene DAT 1 was involved in decreased cortical thickness in the prefrontal cortex of children with ADHD (Fernandez-Jaen & others, 2015)
- Coverage of research on how neurofeedback has been effective in reducing children's ADHD symptoms (Zuberer, Brandeis, & Drechsler, 2015)
- Inclusion of recent research in which a higher physical activity level in adolescence was linked to a lower level of ADHD in emerging adulthood (Rommel & others, 2015)
- Description of a recent meta-analysis that concluded that short-term aerobic exercise is effective in reducing symptoms such as inattention, hyperactivity, and impulsivity (Cerillo-Urbina & others, 2015)
- Coverage of a recent meta-analysis in which exercise was associated with better executive function in children with ADHD (Vysniauske & others, 2016)
- New discussion of the recent interest in mindfulness training for children with ADHD, including a recent meta-analysis in which mindfulness training significantly improved the attention of children with ADHD (Cairncross & Miller, 2016)
- Updated data on the percentage of children who receive special education services in U.S. schools for a language impairment (Condition of Education, 2015)
- Updated coverage of autism spectrum disorders, including the recent increase in the estimate of the number of children with these disorders in the United States
- New description of haptic devices for children with a visual impairment (Pawluk & others, 2015)
- Extensive updating and expansion of content on instructional technology and assistive technologies to improve the learning of students with a disability, including recently developed mobile apps (Butcher & Jameson, 2016)
- Updated data on the increased percentage of children with disabilities who spend more than 80 percent of their school time in a regular classroom (Condition of Education, 2015)
- New commentary about the increasing call to widen the criteria for giftedness to include creativity and commitment (Ambrose & Sternberg, 2016a, b)
- Discussion of a recent study that revealed parents and teachers rated elementary school children who are not

gifted as having more emotional and behavioral problems than children who are gifted (Eklund & others, 2015)
- New description of information-processing skills as an important way that children who are gifted differ from their nongifted counterparts (Ambrose & Sternberg, 2016a, b)
- New discussion of the underrepresentation of African American, Latino, and Native American children in gifted programs (Ford, 2014, 2015a, b; Mills, 2015)

CHAPTER 7
BEHAVIORAL AND SOCIAL COGNITIVE APPROACHES

- Updated content on the number of states that still allow corporal punishment in schools
- Expanded coverage of the debate about the outcomes of physical punishment, including content on punishment research being correlational in nature, the importance of considering reciprocal interaction effects, and the fact that no research has reported positive effects of physical punishment on children (Gershoff, 2013; Laible, Thompson, & Froimson, 2015)
- New description of a recent meta-analysis that found negative outcomes of physical punishment in children (when the physical punishment was distinguished from physical abuse) (Gershoff & Grogan-Kaylor, 2016)
- Updated content on the disparity in the percentage of teachers who are African American or Latino compared with the ethnic composition of students (National Center for Education Statistics, 2015)
- In the coverage of positive models on TV shows, description of a recent meta-analysis of studies in 14 countries that found watching the TV show *Sesame Street* produced positive outcomes for young children in three areas: cognitive skills, learning about the world, and attitudes toward outgroups (Mares & Pan, 2013)
- New content on the very low percentage of elementary and secondary school teachers who were African American (1.8 percent) and Latino (1.6 percent) in a recent year (Toldson & Lewis, 2012)
- Description of a study that involved 35 Head Start programs in which positive achievement outcomes, including school readiness, occurred through improvement in teacher-child relationships and increased self-regulation (Blair & Raver, 2015)
- Inclusion of information about research that indicates self-regulation fosters conscientiousness both directly and indirectly through its link to academic motivation/success and internalized compliance with norms (Eisenberg & others, 2014)
- Coverage of information about an app that can be used with iPads to improve children's self-regulation.

CHAPTER 8
THE INFORMATION-PROCESSING APPROACH

- Discussion of recent research that found sustained attention in preschoolers was linked to a greater likelihood of completing college by 25 years of age (McClelland & others, 2013)
- New coverage of a research review with details about the complexities of why media multitasking can interfere with children's learning (Courage & others, 2015)
- Description of a recent study in which sustained attention continued to improve during adolescence, with this improvement linked to maturation of the brain's frontal lobes (Thillay & others, 2015)
- Inclusion of information about computer exercises and games for improving children's attention being available at www.teach-the-brain.org/learn/attention/index
- New content on technology that makes it easier to embed questions and gather students' responses (EdPuzzle and PlayPosit)
- New commentary about working memory developing so slowly that even by 8 years of age, children can only hold in memory half the items that adults can remember (Kharitonova, Winter, & Sheridan, 2015)
- Coverage of two recent studies that found better working memory was linked to various aspects of reading and math achievement (Blankenship & others, 2015; Jaroslawska & others, 2016)
- New research that found a working memory training program improved the arithmetic problem-solving skills of 8- to 10-year-olds (Cornoldi & others, 2015)
- Description of recent research in which children's verbal working memory was linked to these aspects of both first and second language learners: morphology, syntax, and grammar (Verhagen & Leseman, 2016)
- Coverage of a recent working memory training program that improved the listening comprehension skills of first-grade children (Peng & Fuchs, 2016b)
- Information for teachers about where to learn about the Cogmed working memory training program for children and how it can be used in their classroom: www.cogmed.com/educators
- Important new additions to best practices for helping children improve their memory: (1) distributed practice, (2) practice testing, and (3) elaborative interrogation (Dunlosky & others, 2013)
- Inclusion of a recent research review that found high utility for learning and memory using distributed practice and practice testing, and moderate utility for elaborative interrogation (Dunlosky & others, 2013). This review found that highlighting and underlining, summarization, rereading, the keyword method, and imagery use for text learning had low utility

- Expanded and updated coverage of factors that influence children's theory of mind development: prefrontal cortex functioning (Powers, Chavez, & Hetherington, 2015) and various aspects of social interaction (Hughes & Devine, 2015), including secure attachment and mental state talk, and having older siblings and friends who engage in mental state talk
- New description of recent research indicating that children with attention deficit hyperactivity disorder (Mohammadzadah & others, 2016) and specific language disorder (Nilsson & de Lopez, 2016) have theory-of-mind deficits

CHAPTER 9
COMPLEX COGNITIVE PROCESSES

- Updated link to concept- and mind-mapping software (https://en.wikipedia.org/wiki/List_of_concept-_and_mind-mapping_software) and expanded commentary about the uses and availability of Inspiration and Kidspiration
- Greatly expanded and updated coverage of knowledge construction technology tools for the classroom
- New entry in "Best Practices: Strategies for Improving Children's Thinking": "Embrace technology as a context for improving students' thinking skills."
- Inclusion of a new *Through the Eyes of Teachers* interlude that features Kathy Cassidy, a first-grade teacher who extensively uses technology to improve students' learning
- Important new major section on executive function, an area where increased interest and research has occurred in the last decade (Cassidy, 2016; Moriguichi, Chevallier, & Zelazo, 2016; Muller & Kerns, 2015)
- Coverage of a recent study of young children that found executive function was associated with emergent literacy and vocabulary development (Becker & others, 2014)
- New coverage of developmental changes in executive function in early childhood, including recent research on executive function and school readiness (Willoughby & others, 2016)
- New description of developmental changes in executive function in middle and late childhood, including those involving self-control and inhibition, working memory, cognitive flexibility
- New discussion of developmental changes in executive function in adolescence, including those involving cognitive control and controlling attention
- New coverage of many diverse activities and factors that have been found to increase children's executive function, including working memory, aerobic exercise, some aspects of language, scaffolding of self-regulation, mindfulness training, imagination, and some types of school curricula (Bodrova & Leong, 2015; Carlson & White, 2013; Diamond, 2013; Gallant, 2016; Hillman & others, 2014; Nesbitt, Farran, & Fuhs, 2015)
- Inclusion of recent research that has found parents and teachers play important roles in the development of children's executive function (Masten, 2016)
- Much expanded and updated coverage of mindfulness, including description of how mindfulness training can be implemented in schools (Roeser & Eccles, 2015) and recent research indicating that a mindfulness training program was effective in improving the cognitive control of fourth- and fifth-graders (Schonert-Reichl & others, 2015)
- Description of two recent studies that found mindfulness training reduced public school teachers' stress, improved their mood at school and at home, and produced better sleep (Crain, Schonert-Reichl, & Roeser, 2016; Taylor & others, 2016)
- New discussion of the recently developed concept of *contemplative science*, which involves using activities such as yoga, meditation, and tai chi to improve children's cognitive and socioemotional development (Roeser & Eccles, 2015)
- New coverage of a recent meta-analysis that found dialogue (discussion) and authentic or situated problems and examples were beneficial in improving students' general critical thinking skills (Abrami & others, 2015)
- New content added to "Best Practices: Strategies for Improving Children's Thinking" that recommends keeping up-to-date with the latest information about mindfulness training with one strategy being to look at the recently created journal *Mindfulness* and a recent book, *Mindfulness for Teachers* (Jennings, 2015)
- New content on how creative thinking is declining in U.S. children and description of how China is increasingly emphasizing the teaching of creative thinking skills in schools (Gregorson, Kaufman, & Snyder, 2013; Kim, 2010; Plucker 2010)
- Inclusion of a new entry for improving children's creativity that focuses on digital storytelling and writing
- New content in the discussion of improving transfer of learning to include digital field trips, such as the Web site of the National Gallery of Art

CHAPTER 10
SOCIAL CONSTRUCTIVIST APPROACHES

- New technology content that describes a good tool for creating personalized learning paths for students: Oppia.org
- New inclusion of a recent analysis that found the Reading Recovery program was successful in improving the general reading achievement of struggling first-grade readers (What Works Clearinghouse, 2014)
- Update of the Success for All tutoring program, indicating a lack of scientifically qualified studies to evaluate the program adequately (What Works Clearinghouse, 2012)

- Coverage of a recent study in which peer tutoring improved the receptive language and print knowledge of English language learners (Xu, 2015)
- Description of a recent meta-analysis that found peer tutoring improved students' achievement (Leung, 2015). In this analysis, students in secondary schools improved the most, followed by college students, elementary school students, and kindergarten students
- Updated data on the success of the IDRA Valued Youth program that found only 1 percent of its peer tutors dropped out of school in the United States and 2.2 percent in Brazil (IDRA, 2013)
- New commentary about how online video conferencing (for example, Skype or Google Hangouts) can be used to facilitate online peer tutoring
- Discussion of a recent meta-analysis of 26 studies that found cooperative learning improved students' math achievement and attitude toward math (Capar & Tarim, 2015)
- Coverage of a recent study of fifth-graders in which the cooperative learning teaching method improved students' achievement and satisfaction more than the lecture teaching method (Mohammadjani & Tonkaboni, 2015)
- Inclusion of recent research that revealed cooperative learning increased fourth-grade students' vocabulary skills more than a traditional teaching method (Bilen & Tavil, 2015)
- Deletion of the descriptions of two social constructivist programs—Fostering a Community of Learners and Schools of Thought—because while promising, they were not widely adopted in schools in the last decade

CHAPTER 11
LEARNING AND COGNITION IN THE CONTENT AREAS

- Significant expansion and updates of technology and teaching in different content areas based on input from leading expert Kirsten Butcher
- Coverage of a recent study of fourth-grade students in which oral reading fluency, but not silent reading fluency, was linked to reading comprehension (Price & others, 2016)
- Description of a recent study in which both individualized and small-group guided oral reading interventions improved the reading comprehension and attitudes of struggling readers (Oostdam, Blok, & Boendermaker, 2015)
- Inclusion of a recent research overview that concluded a number of studies provide support for the benefits of reciprocal teaching in improving students' reading skills (McAllum, 2014)
- Discussion of a recent strategy intervention with struggling second-grade readers and their teachers that provided positive results for a number of writing outcomes (Harris, Graham, & Adkins, 2015)
- Inclusion of information about online tools for writing such as Google docs that make it easier for students to engage in collaborative writing
- New description of how students can publish online via the Web or to iBooks by using an app like Book Creator
- New coverage of leading expert Jo Boaler's (2016) recent book (*Mathematical Mindsets*), research, and recommendations for teachers, parents, and students on teaching and learning math more effectively. She argues that too often students use memorization to learn math but that research shows that the highest achievers are those who learn math deeply, slowly, and creatively
- New description of Carol Dweck's (2006, 2015a, b) concept of mindset and the important distinction between a growth mindset and a fixed mindset
- New content on how teachers can select online tools and apps that teach math concepts in an interactive way rather than selecting tools such as calculators that offload computational processes without promoting conceptual understanding
- Inclusion of information about apps such as the Puppet Pals apps and My Story Book Creator that allow even young children to record stories
- New discussion of a blog called "Technology for Teachers" that offers good ideas for supporting learning and instruction using online tools and apps

CHAPTER 12
PLANNING, INSTRUCTION, AND TECHNOLOGY

- Coverage of a recent research review in which asking a large number of questions and monitoring the responses of students was one of four specific practices linked to students' achievement (Coe, Aloisi, Higgins, & Major, 2014)
- Expanded and updated discussion of parents' roles in students' homework, including a recent research review that concluded positive achievement outcomes occur when parents are directly involved in assisting their children during homework tasks (Aries & Cabus, 2015)
- Description of a recent meta-analysis that found problem-based learning had a more positive influence on students' attitudes than did traditional teaching methods (Batdi, 2014)
- Inclusion of a recent study in which problem-based learning was associated with high school students' critical thinking skills in math courses (Widyatiningtyas & others, 2015)
- Discussion of a recent description of the Minnesota New Country School, where a learner-centered problem-based learning approach is used as the main teaching strategy (Aslan & Reigeluth, 2015/2016). In this analysis, the

number one challenge of using this strategy was changing students' mindsets from being directed by teachers to self-directed
- Coverage of Kent Innovation High School in Michigan that extensively uses project-based learning and the Internet (Langel, 2015)
- Extensive revision, expansion, and updating of the discussion of teaching and technology based on leading expert Kirsten Butcher's recommendations
- New content on computer-supported collaborative learning (CSCL) and its use in students' collaborative learning (Kirschner & others, 2015; Xiong, So, & Toh, 2015)
- Inclusion of new content on blog publishing and online citizen science projects as good technologies for collaborative learning
- New commentary on how teachers are increasingly using social media as an important tool for professional networking and development
- New discussion of the recently updated and modified student technology standards established by the International Society for Technology in Education (ISTE, 2016)
- Extensively revised, expanded, and updated self-assessment on "Evaluating My Technology Skills and Attitudes"

CHAPTER 13
MOTIVATION, TEACHING, AND LEARNING

- Inclusion of recent research indicating that non-controlling relatedness support and satisfaction are associated with more effective student engagement, learning, and achievement (Linnenbrink-Garcia & Patall, 2016)
- New coverage of contextual factors that influence students' interest (Linnenbrink-Garcia & Patall, 2016)
- Revised commentary indicating that a key aspect of education is giving students critical/corrective feedback
- New discussion of the recently developed concept of a belonging mindset and its link to academic achievement and physical and mental health (Rattan & others, 2015)
- Inclusion of recent research indicating that experiences and discussions involving a belonging mindset were associated with improvements in the academic achievement of underrepresented groups (Stephens, Hamedani, & Destin, 2014; Walton & others, 2014)
- Much expanded and updated coverage of Carol Dweck's concept of a growth mindset
- Inclusion of recent research that found students from lower-income families were less likely to have a growth mindset than were students from wealthier families but the achievement of students from lower-income families was more likely to be protected if they had a growth mindset (Claro, Paunesku, & Dweck, 2016)
- Description of a recent study in which underachieving students benefited from reading online modules about how the brain changes when people learn and study (Paunesku & others, 2015)
- Coverage of a recent study that found a growth mindset can prevent negative stereotypes from undermining achievement (Good, Rattan, & Dweck, 2012)
- Discussion of a longitudinal study that indicated a non-limited theory of mind predicted better self-regulation and higher achievement among students taking a heavy course load (Job & others, 2015)
- New commentary in the self-efficacy section that students can benefit when teachers recount how they have learned from mistakes that they have made
- Discussion of a recent study that found pre-service elementary school teachers had lower expectations for girls' math achievement (Mizala, Martinez, & Martinez, 2015)
- New description of the lower academic expectations parents and teachers have for African American adolescent boys than African American adolescent girls (Rowley & others, 2014)
- Important new section on delay of gratification
- Description of Walter Mischel's classic research on young children's delay of gratification and longitudinal research that has found delay of gratification in preschool children is linked to their success in school, careers, and physical/mental health in adolescence and adulthood (Mischel, 2014; Moffitt, 2012; Schlam & others, 2013)
- Inclusion of recent research in which positive expectations of tenth-grade students, their parents, and their English and math teachers predicted their level of educational attainment four years later (Gregory & Huang, 2013)
- Coverage of a recent meta-analysis that confirmed self-handicapping is linked to students' lower achievement (Schwinger & others, 2014)
- Description of a recent study that found the worry component of test anxiety was linked to lower achievement in eleventh-grade students (Steinmayr & others, 2016)
- Inclusion of recent research in which parents' perfectionism was linked to their children's and adolescents' higher anxiety level (Affrunti & Woodruff-Borden, 2014)
- New entry for growth mindset in "Self-Assessment 1: Evaluating My Motivation"

CHAPTER 14
MANAGING THE CLASSROOM

- Updated and expanded coverage of student response systems, including the trend toward using systems that do not require a specialized device but can be used with different devices (such as a computer, laptop, cell phone, and so on)

- New description of Plickers (https://plickers.com), one of the best student response systems for K-12 classrooms
- Expanded and updated commentary about African American male students' much higher rate of experiencing disciplinary actions in schools (Chatmon & Gray, 2015)
- Coverage of a recent study in which the mentoring relationship was more likely to endure when youth-initiated mentoring was implemented and the mentors were of the same ethnic group as the youth (Schwartz & others, 2013). Also in this study, when the youth-initiated mentoring endured, the mentoring was associated with academic and vocational success three years later.
- Substantial expansion and updating of information on bullying and cyberbullying (Naidoo & others, 2016; Wang & others, 2016)
- Inclusion of recent research on the types of positive and negative parenting that are linked to bullying (Lereya, Samara, & Wolke, 2013)
- Description of recent research on the negative outcomes of being bullied, including internalizing problems and suicide attempts (Schwartz & others, 2015; Yen & others, 2014)
- Discussion of a longitudinal study that found children who were bullied at 6 years of age were more likely to show excessive weight gain at 12 to 13 years of age (Sutin & others, 2016)
- Inclusion of a longitudinal study that revealed being a victim of bullying in childhood was linked to increased use of mental health services five decades later (Evans-Lacko & others, 2016; Flannery & others, 2016)
- Coverage of a recent study in which cyberbullying was more strongly linked to suicidal ideation than traditional bullying (van Geel, Vedder, & Tanilon, 2014)
- Discussion of a recent research review that concluded bullying interventions that focused on the whole school, such as Olweus', were more effective than interventions involving classroom curricula or social skills training (Cantone & others, 2015)
- Description of a recent teacher intervention in elementary and secondary schools to decrease bullying that focused on increasing bullies' empathy and condemning their behavior; the intervention was effective in increasing the bullies' intent to stop bullying but blaming the bully had no effect (Garandeau & others, 2016)
- Expanded and updated bullying intervention recommendations to include the recent book *Bullying Beyond the Schoolyard: Preventing and Responding to Cyberbullying* (Hinduja & Patchin, 2015)

CHAPTER 15
STANDARDIZED TESTS AND TEACHING

- New discussion of a trend in which less attention is given to traditional standardized tests and far more emphasis placed on end-of-year standards-based tests created by states for accountability purposes. Most teachers today are much more concerned about these accountability tests than tests of aptitude or traditional standardized achievement tests
- Expanded description of the problems involved in using a single end-of-year test that is relatively short and the concern that it is not possible for such a test to assess an entire year of students' learning
- New coverage of the recently developed Common Core State Standards Initiative to provide more detailed guidelines and milestones for students to achieve at each level, and the controversy the Standards have generated (Common Core State Standards Initiative, 2016)
- New content on the Every Student Succeeds Act (ESSA) that became U.S. law in December 2015 (Rothman, 2016). This law replaces No Child Left Behind and while not totally eliminating state standards for testing students, reduces their influence. The new law also allows states to opt out of Common Core standards.
- Updated comparisons of the performance of U.S. elementary and secondary school students with students in many other countries on tests of reading, math, and science skills (Kelly & others, 2013; Martin & others, 2012; Mullis & others, 2012). Especially disconcerting is U.S. students' decline in ranking versus other countries at higher grade levels in secondary school
- Coverage of the recently developed *ed*TAP national teacher test created by the Stanford Center for Assessment, Learning, and Equity (SCALE, 2013) that includes both written tests of subject knowledge and observations of teacher candidates in the classroom to determine whether they are effective in planning, teaching, and assessing student learning

CHAPTER 16
CLASSROOM ASSESSMENT

- New and expanded coverage of technology and assessment, including the increase in online methods of assessing students' higher-level thinking; two of the best online assessment tools for this purpose are Kahoot! and Socrative
- Inclusion of information from a recent national survey regarding teachers' and students' perceptions of various aspects of state-mandated accountability tests and classroom tests (Grunwald & Associates, 2014)
- Description of a recent study that found community college students who took self-assessment courses showed greater self-regulation and greater likelihood of continuing their college education (Mahlberg, 2015)
- Coverage of Susan Brookhart's (2015) recent view on the advantages that multiple-choice items can convey
- New commentary that recently there has been increased interest in including performance assessments

in state assessment of students' learning and progress (Darling-Hammond & Falk, 2013; Parsi & Darling-Hammond, 2015)
- Addition of a definition of *rubric*
- New commentary noting that portfolios can now be created using cloud-based tools
- New discussion of how artifacts can be digitized via image files, video files, and audio files and then the files can be placed online in cloud repositories. Apps also are available for digitizing students' work, with one of the best for this purpose being Three Ring
- New coverage of two longitudinal studies regarding the extent of grade inflation in U.S. high schools (Godfrey, 2011–2012; Zhang & Sanchez, 2013)

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Peter Young, *Southern Oregon University*
Steven Yussen, *University of Minnesota*
Samuel Zimmerman, *Pace University*

Early Childhood, Elementary School, and Secondary School Teachers

Following are the outstanding teachers who provided descriptions of their real-world experiences in the classroom for the Developmental Focus feature that appears one or more times in each chapter.

Keren Abra, *School of the Sacred Heart, San Francisco, CA*
Connie Christy, *Aynor Elementary School (Preschool Program), Aynor, SC*
Maureen "Missy" Dangler, *Suburban Hills School, Chatham, NJ*
Mark Fodness, *Bemidji Middle School, Bemidji, MN*
Elizabeth J. Frascella, *Clinton Elementary, Chatham, NJ*
Susan M. Froelich, *Clinton School, Maplewood, NJ*
Valerie Gorham, *Kiddie Quarters, Union, NJ*
Jennifer Heiter, *Bremen High School, Bremen, IN*
Craig Jensen, *Cooper Mountain Elementary, Portland, OR*
Heidi Kaufman, *MetroWest YMCA Child Care and Educational Program, Framingham, MA*
Esther Lindbloom, *Cooper Mountain Elementary, Beaverton, OR*
Casey Maass, *Edison Middle School, West Orange, NJ*
Karen L. Perry, *Cooper Mountain Elementary, Portland, OR*
Dennis Peterson, *Deer River High School, Bemidji, MN*
Felicia Peterson, *Pocantico Hills School, Sleepy Hollow, NY*
Janine Guida Poutre, *Clinton Elementary, Chatham, NJ*
Shane Schwarz, *Clinton Elementary, South Orange, NJ*
Sandy Swanson, *Menomonee Falls High School, Menomonee Falls, WI*
Heather Zoldak, *Ridge Wood Elementary School, Northville, MI*

Expert Consultants From Previous Editions

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Kenji Hakuta, *Stanford University*
Daniel Hallahan, *University of Virginia*
James Kauffman, *University of Virginia*
Richard Mayer, *University of California—Santa Barbara*
Barbara McCombs, *University of Denver*
James McMillan, *Virginia Commonwealth University*
Valerie Pang, *San Diego State University*
Michael Pressley, *University of Notre Dame*
Dale Schunk, *University of North Carolina—Greensboro*
Robert Siegler, *Carnegie Mellon University*
Karen Swan, *Kent State University*

Panel of Early Childhood, Elementary, Middle, and High School Teachers

A large panel of individuals who teach at the early childhood, elementary, middle, and high school levels provided me with the material about special teaching moments that they have experienced. These moments appear in the Teaching Stories and Best Practices boxes throughout the text. I owe these

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Mrs. Lou Aronson, *Devils Lake High School, Devils Lake, ND*
Daniel Arnoux, *Lauderhill Middle Community School, Broward, FL*
Lynn Ayres, *East Middle School, Ypsilanti, MI*
Fay Bartley, *Bright Horizon Childrens Center, Bronx, NY*
Barbara M. Berry, *Ypsilanti High School, Ypsilanti, MI*
Kristen Blackenship, *Salem Church Elementary, Midlothian, VA*
Wendy Bucci, *Sugar Creek Elementary School, Verona, WI*
Stella Cohen, *Hackley School, Tarrytown, NY*
Connie Christy, *Aynor Elementary, Aynor, SC*
Julie Curry, *Hubbard Elementary School, Forsyth, GA*
Alina Durso, *PS 59-Beekman Hill International School, New York, NY*
Andrea Fenton, *Cortez High School, Glendale Union, AZ*
Mark Fodness, *Bemidji Middle School, Bemidji, MN*
Kathy Fuchser, *St. Francis High School, Humphrey, NE*
Lawren Giles, *Baechtel Grove Middle School, Bibb County, GA*
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Heidi Kaufman, *Associate Executive Director of Childcare, MetroWest YMCA, Framingham, MA*
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Margaret Longworth, *St. Lucie West Middle School, St. Lucie, FL*
Adriane Lonzarich, *Heartwood, San Mateo, CA*
RoseMary Moore, *Angelo State University, Angelo, TX*
Therese Olejniczak, *Central Middle School, East Grand Forks, MN*
Dennis Peterson, *Deer River High School, Bemidji, MN*
Chuck Rawls, *Appling Middle School, Bibb County, GA*
Verna Brown Rollins, *West Middle School, Ypsilanti, MI*
Donna L. Shelhorse, *Short Pump Middle School, Henrico County, VA*
Michele Siegal, *Brockton High School, Brockton, MA*
Jason Stanley, *Syracuse Dunbar Avoca, Syracuse, NE*
Vicky Stone, *Cammack Middle School, Huntington, VA*
Sandy Swanson, *Menomonee Falls High School, Menomonee Falls, WI*
Tamela Varney, *Central City Elementary, Cabell County, WV*
Marlene Wendler, *St. Paul's Lutheran School, New Ulm, MN*
William Willford, *Perry Middle School, Perry, GA*
Yvonne Wilson, *North Elementary School, Deer River, MN*
Susan Youngblood, *Weaver Middle School, Bibb County, GA*
Heather Zoldak, *Ridge Wood Elementary, Northville, MI*

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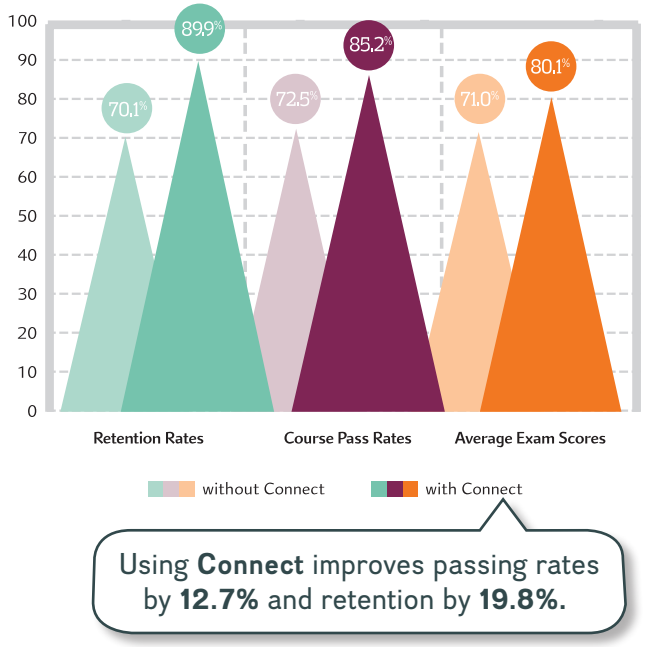

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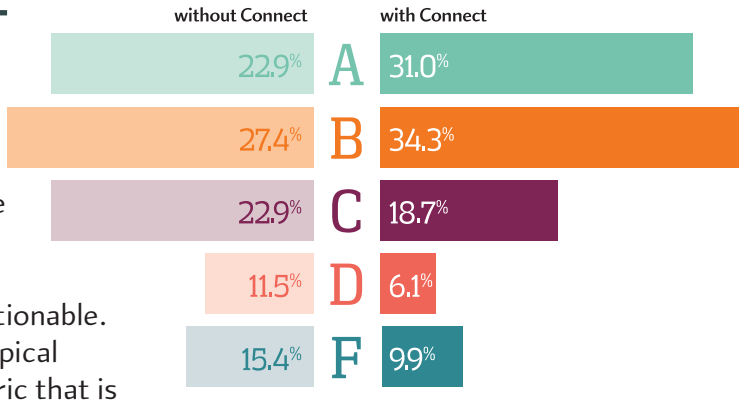

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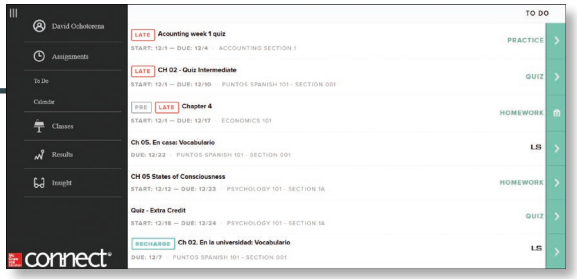

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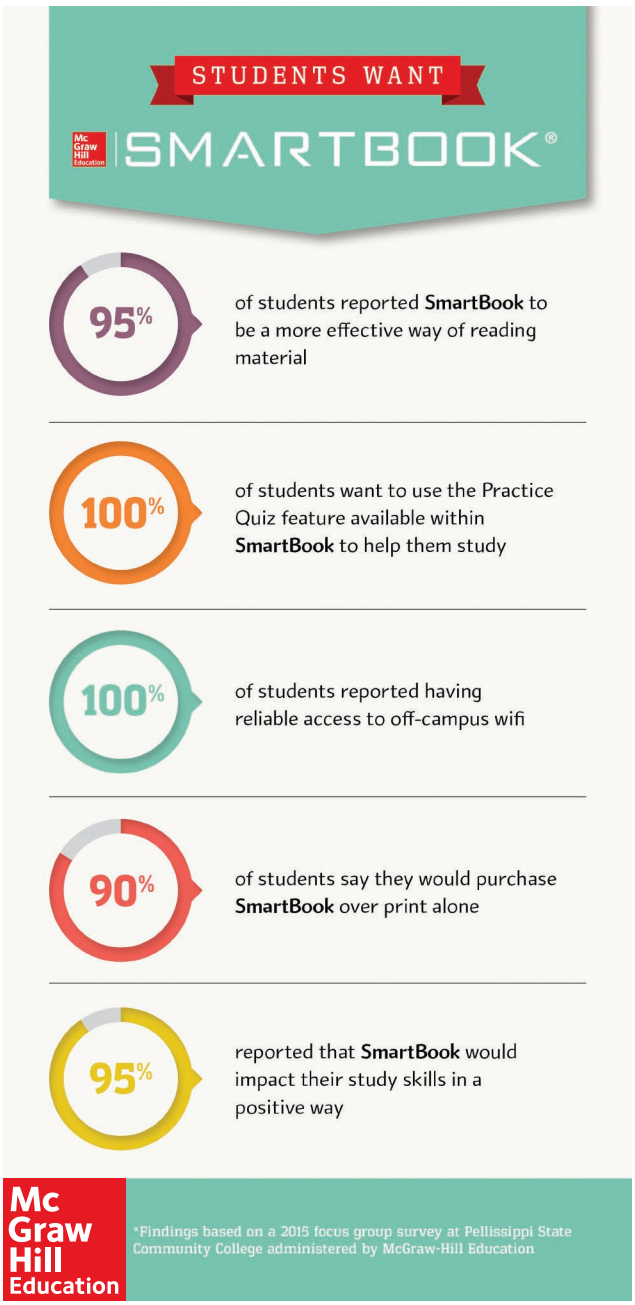

chapter 1

EDUCATIONAL PSYCHOLOGY: A TOOL FOR EFFECTIVE TEACHING

chapter **outline**

1 Exploring Educational Psychology

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

Historical Background

Teaching: Art and Science

2 Effective Teaching

Learning Goal 2 Identify the attitudes and skills of an effective teacher.

Professional Knowledge and Skills

Commitment, Motivation, and Caring

3 Research in Educational Psychology

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

Why Research Is Important

Research Methods

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

Quantitative and Qualitative Research

I touch the future. I teach.

—Christa McAuliffe
American Educator and Astronaut, 20th Century

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Connecting with **Teachers** Margaret Metzger

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

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

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

Preview

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

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

1 EXPLORING EDUCATIONAL PSYCHOLOGY

Historical Background | Teaching: Art and Science

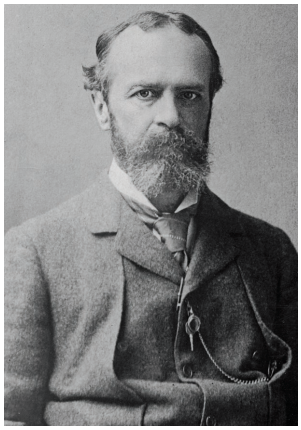
Psychology is the scientific study of behavior and mental processes. **Educational psychology** is the branch of psychology that specializes in understanding teaching and learning in educational settings. Educational psychology is a vast landscape that will take us an entire book to describe.

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

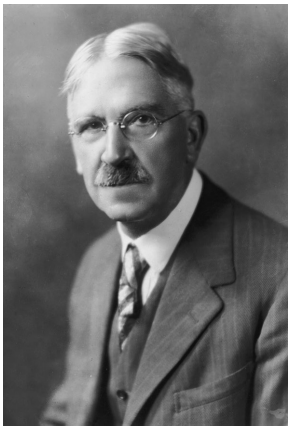
HISTORICAL BACKGROUND

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

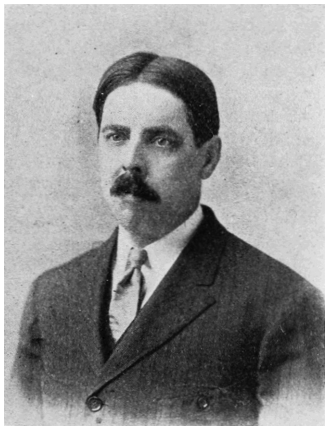
William James Soon after launching the first psychology textbook, *Principles of Psychology* (1890), William James (1842–1910) gave a series of lectures called "Talks to Teachers" (James, 1899/1993) in which he discussed the applications of psychology to educating children. James argued that laboratory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



William James



John Dewey



E. L. Thorndike

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

(*Left to Right*) © Paul Thompson/FPG/Getty Images; © Hulton Archive/Getty Images; Source: The Popular Science Monthly, 1912

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

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

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

Diversity and Early Educational Psychology The most prominent figures in the early history of educational psychology, as in most disciplines, were mainly White males such as James, Dewey, and Thorndike. Prior to changes in civil rights laws and policies in the 1960s, only a few dedicated non-White individuals obtained the necessary degrees and broke through racial exclusion barriers to take up research in the field (Spring, 2014; Webb & Metha, 2017).

DIVERSITY

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

Mamie and Kenneth Clark

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

© Courtesy of Kate C. Harris

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

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

The Cognitive Revolution The objectives spelled out in the behavioral approach to learning did not address many of the actual goals and needs of classroom educators (Hilgard, 1996). In reaction, as early as the 1950s, Benjamin Bloom created a taxonomy of cognitive skills that included remembering, comprehending, synthesizing, and evaluating, which he suggested teachers should help students develop and use. The cognitive revolution in psychology began to take hold by the 1980s and ushered in an era of enthusiasm for applying the concepts of cognitive psychology—memory, thinking, reasoning, and so on—to help students learn. Thus, toward the latter part of the twentieth century, many educational psychologists returned to an emphasis on the cognitive aspects of learning advocated by James and Dewey at the beginning of the century. Both cognitive and behavioral approaches—especially cognitive—continue to be a part of educational psychology today (Fuchs & others, 2016; Wang & others, 2016). We will have much more to say about these approaches later in this text. More recently, educational psychologists have increasingly focused on the socioemotional aspects of students' lives. For example, they are analyzing the school as a social context and examining the role of culture in education (Gauvain, 2016; Koppelman, 2017; Rowe, Ramani, & Pomerantz, 2016; Wentzel & Ramani, 2016). We explore the socioemotional aspects of teaching and learning in many chapters of this text.

TEACHING: ART AND SCIENCE

RESEARCH

How scientific can teachers be in their approach to teaching? Both science and the art of skillful, experienced practice play important roles in a teacher's success. Educational psychology draws much of its knowledge from broader theory and research in psychology (Graham & Taylor, 2016; Ryan & Deci, 2016). For example, the theories of Jean Piaget and Lev Vygotsky were not created in an effort to inform teachers about ways to educate children, but in other chapters you will see that both

of these theories have many applications that can guide your teaching. The field also draws from theory and research created and conducted directly by educational psychologists, and from teachers' practical experiences. For example, you will read about Dale Schunk's (2016) classroom-oriented research on self-efficacy (the belief that one can master a situation and produce positive outcomes). Educational psychologists also recognize that teaching sometimes must depart from scientific recipes, requiring improvisation and spontaneity (Borich, 2017; Parkay, 2016).

As a scientific discipline, educational psychology aims to provide you with research knowledge that you can effectively apply to teaching situations and with research skills that will enhance your understanding of the factors that influence student learning (Glesne, 2016). But your teaching will still remain an art. In addition to what you can learn from research, you will also continually make important judgments in the classroom based on your personal skills and experiences as well as the accumulated wisdom shared with you by other teachers (Estes & Mintz, 2016).

Karen Mirkovich, an elementary school teacher in Woodbridge, Virginia, works with students during a group reading session. Recognized as an outstanding teacher, Karen has a coveted National Board Certificate. *To what extent is her teaching likely art, science, or both?*

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Review, Reflect, and Practice

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

REVIEW

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

REFLECT

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

PRAXIS™ PRACTICE

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

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

Thinking Back/Thinking Forward

Self-efficacy plays an important role in motivation. Connect to "Motivation, Teaching, and Learning."

LG 2 Identify the attitudes and skills of an effective teacher.

2 EFFECTIVE TEACHING

Professional Knowledge and Skills | Commitment, Motivation, and Caring

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

PROFESSIONAL KNOWLEDGE AND SKILLS

Effective teachers have good command of their subject matter and a solid core of teaching skills (Mayer & Alexander, 2017). They have excellent instructional strategies supported by methods of goal setting, instructional planning, and classroom management. They know how to motivate, communicate, and work effectively with students who have different levels of skills and come from culturally diverse backgrounds. Effective teachers also understand how to use appropriate levels of technology in the classroom.

Subject-Matter Competence In their wish lists of teacher characteristics, secondary school students increasingly have mentioned "teacher knowledge of their subjects" (NAASP, 1997). Having a thoughtful, flexible, conceptual understanding of subject matter is indispensable for being an effective teacher (Hamilton & Duschi, 2017). Of course, knowledge of subject matter includes more than just facts, terms, and general concepts. It also includes knowledge about organizing ideas, connections among ideas, ways of thinking and arguing, patterns of change within a discipline, beliefs about a discipline, and the ability to carry ideas from one discipline to another. Clearly, having a deep understanding of the subject matter is an important aspect of being a competent teacher (Anderman & Klassen, 2016; Burden & Byrd, 2016; Guillaume, 2016).

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

The **constructivist approach** is a learner-centered approach that emphasizes the importance of individuals actively constructing their knowledge and understanding with guidance from the teacher. In the constructivist view, teachers should not attempt to simply pour information into children's minds. Rather, children should be encouraged to explore their world, discover knowledge, reflect, and think critically with careful monitoring and meaningful guidance from the teacher (Robinson-Zanartu, Doerr, & Portman, 2015; Van de Walle, Karp, & Bay-Williams, 2016). Constructivists argue that for too long children have been required to sit still, be passive learners, and rotely memorize irrelevant as well as relevant information (Parkay, 2016).

Today, constructivism may include an emphasis on *collaboration*—children working with each other in their efforts to know and understand (Gauvain, 2016). A teacher with a constructivist instructional philosophy would not have children memorize information rotely but would give them opportunities to meaningfully construct knowledge and understand the material while guiding their learning (Bendixen, 2016).

By contrast, the **direct instruction approach** is a structured, teacher-centered approach characterized by teacher direction and control, high teacher expectations for students' progress, maximum time spent by students on academic tasks, and

constructivist approach A learner-centered approach to learning that emphasizes the importance of individuals actively constructing knowledge and understanding with guidance from the teacher.

direct instruction approach A structured, teacher-centered approach characterized by teacher direction and control, high teacher expectations for students' progress, maximum time spent by students on academic tasks, and efforts by the teacher to keep negative affect to a minimum.

efforts by the teacher to keep negative affect to a minimum. An important goal in the direct instruction approach is maximizing student learning time (Borich, 2017; Joyce, Weil, & Calhoun, 2015).

Some experts in educational psychology emphasize that many effective teachers use both a constructivist *and* a direct instruction approach rather than relying exclusively on one or the other (Darling-Hammond & Bransford, 2005). Further, some circumstances may call for a constructivist approach, others for a direct instruction approach. For example, experts increasingly recommend an explicit, intellectually engaging direct instruction approach when teaching students who have a reading or a writing disability (Berninger & others, 2015). Whether you teach more from a constructivist approach or more from a direct instruction approach, you can be an effective teacher.

What characterizes constructivist and direct instruction approaches to educating students?

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Thinking Skills Effective teachers model and communicate good thinking skills. Among the most important thinking skills for teachers to engage in and guide their students in developing are **critical thinking** skills, which involve thinking reflectively and productively and evaluating evidence. Getting students to think critically is not easy; many students develop a habit of passively learning material and rotely memorizing concepts rather than thinking deeply and reflectively (Sternberg & Sternberg, 2017). Thinking critically also means being open-minded and curious on the one hand, yet being careful to avoid making mistakes in interpreting something.

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

Goal Setting and Instructional Planning Whether they take a constructivist or more traditional approach, effective teachers don't just "wing it" in the classroom. They set high goals for their teaching and organize plans for reaching those goals (Senko, 2016). They also develop specific criteria for success. They spend considerable time in instructional planning, organizing their lessons to maximize students' learning (Burden & Byrd, 2016). As they plan, effective teachers reflect and think about how they can make learning both challenging and interesting. Good planning requires consideration of the kinds of information, demonstrations, models, inquiry opportunities, discussion, and practice students need over time to understand particular concepts and develop particular skills. Although research has found that all of these features can support learning, the process of instructional design requires that teachers figure out which things students should do when, in what order, and how (Darling-Hammond & others, 2005).

Thinking Back/Thinking Forward

In planning, teachers need to figure out which things students should do, when, in what order, and how. Connect to "Planning, Instruction, and Technology."

Developmentally Appropriate Teaching Practices Competent teachers have a good understanding of children's development and know how to create instructional materials appropriate for their developmental levels (Bredekamp, 2017; Morrison, 2017). U.S. schools are organized by grade and to some degree by age, but these are not always good predictors of children's development.

At any grade level, there is usually a two- or three-year span of ages with an even wider span of skills, abilities, and developmental stages. Understanding developmental pathways and progressions is extremely important for teaching in ways that are optimal for each child (Feeney, Moravcik, & Nolte, 2016).

DEVELOPMENT

critical thinking Thinking reflectively and productively and evaluating the evidence.

"My mom told me to tell you that I am the educational challenge you were told about in college."
Reprinted by permission of Heiser Zedonek.

Thinking Back/Thinking Forward

The best teachers have very few discipline problems, not because they are great disciplinarians but because they are great teachers. Connect to "Managing the Classroom."

Throughout this text, we call attention to developmental aspects of educating children and provide examples of teaching and learning that take into account a child's developmental level. Two chapters are devoted exclusively to development: "Cognitive and Language Development" and "Social Contexts and Socioemotional Development."

Classroom Management Skills An important aspect of being an effective teacher is keeping the class as a whole working together and oriented toward classroom tasks (Emmer & Evertson, 2017). Effective teachers establish and maintain an environment in which learning can occur. To create this optimal learning environment, teachers need a repertoire of strategies for establishing rules and procedures, organizing groups, monitoring and pacing classroom activities, and handling misbehavior (Evertson & Emmer, 2017; Jones & Jones, 2016).

Motivational Skills Effective teachers have good strategies for helping students become self-motivated and take responsibility for their learning (Kitsantas & Cleary, 2016; Soloman & Anderman, 2017; Wentzel & Miele, 2016). Educational psychologists increasingly stress that this is best accomplished by providing real-world learning opportunities of optimal difficulty and novelty for each student. Students are motivated when they can make choices in line with their personal interests. Effective teachers give them the opportunity to think creatively and deeply about projects.

In addition to guiding students to become self-motivated learners, it is essential to establish high expectations for students' achievement (Schunk & DiBenedetto, 2016). High expectations for children's achievement need to come from teachers and parents. Too often children are rewarded for inferior or mediocre performance, and as a result they do not reach their full potential. When high expectations are created, a key aspect of education is to provide children—especially low-achieving children—effective instruction and support to meet these expectations. The chapter on motivation, teaching, and learning covers the topic of motivation in detail.

Communication Skills Also indispensable to teaching are skills in speaking, listening, overcoming barriers to verbal communication, tuning in to students' nonverbal communication, and constructively resolving conflicts (Beebe, Beebe, & Redmond, 2017; Zarefsky, 2017). Communication skills are critical not only in teaching but also in interacting with parents. Effective teachers use good communication skills when they talk "with" rather than "to" students, parents, administrators, and others; keep criticism at a minimum; and have an assertive rather than aggressive, manipulative, or passive communication style. Effective teachers work to improve students' communication skills as well. This is especially important because communication skills have been rated as the skills most sought after by today's employers.

Amber Larkin helps fifth-grade student Miya Kpa improve his academic skills. *What are some strategies for paying more than lip service to individual variation in students?*
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Paying More Than Lip Service to Individual Variations Virtually every teacher knows that it is important to take individual variations into account when teaching, but this is not always easy to do. Your students will have varying levels of intelligence, use different thinking and learning styles, and have different temperaments and personality traits (Hill & Roberts, 2016; Sternberg, 2016). You also are likely to have some gifted students and others with disabilities of various types (Van Tassell-Baska, 2015).

Consider Amber Larkin's challenges and experiences as a beginning teacher (Wong Briggs, 2007). Her classroom was housed in a trailer, and her students included children who were homeless, non–English speaking, had disabilities, or were refugees who had never worn shoes or experienced any type of formal education. After four years of teaching, she was named one of *USA Today*'s National All-Star Teachers. Almost all of her students pass state-mandated No Child Left Behind tests, but she is just as pleased about her students' socioemotional

growth. Her principal described her in the following manner: "There's an unspoken aura that great things are going to happen, and that's how she goes about her day" (Wong Briggs, 2007, p. 6D).

Effectively teaching students with such diverse characteristics requires much thought and effort. **Differentiated instruction** involves recognizing individual variations in students' knowledge, readiness, interests, and other characteristics, and taking these differences into account in planning curriculum and engaging in instruction (Taylor, 2015). Differentiated instruction emphasizes tailoring assignments to meet students' needs and abilities. It is unlikely that a teacher can generate 20 to 30 different lesson plans to address the needs of each student in a classroom. However, differentiated instruction advocates discovering "zones" or "ballparks" in which students in a classroom cluster, thus providing three or four types/levels of instruction rather than 20 to 30. In the chapters titled "Individual Variations" and "Learners Who Are Exceptional" we provide strategies to help you guide students with different levels of skills and different characteristics to learn effectively.

DIVERSITY

Working Effectively with Students from Culturally Diverse Backgrounds Today, one of every five children in the United States is from an immigrant family, and by 2040 it is estimated that one of every three U.S. children will fit this description. Nearly 80 percent of the new immigrants are people of color from Latin America, Asia, and the Caribbean. Approximately 75 percent of the new immigrants are of Spanish-speaking origin, although children speaking more than 100 different languages are entering U.S. schools. In today's world of increasing intercultural contact, effective teachers are knowledgeable about people from different cultural backgrounds and are sensitive to their needs (Bucher, 2015; Koppelman, 2017). Effective teachers encourage students to have positive personal contact with diverse students and think of ways to create such settings. They guide students in thinking critically about cultural and ethnic issues, forestall or reduce bias, cultivate acceptance, and serve as cultural mediators (Gollnick & Chinn, 2017). An effective teacher also needs to be a broker, or middle person, between the culture of the school and the culture of certain students, especially those who are unsuccessful academically (Sarraj & others, 2015).

What are some strategies effective teachers use regarding diversity issues?

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Here are cultural questions that competent teachers ask themselves (Pang, 2005):

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

Assessment Knowledge and Skills Competent teachers also have good assessment knowledge and skills. There are many aspects to effectively using assessment in the classroom (Brookhart & Nitko, 2015; Popham, 2017). You will need to decide what types of assessments you want to use to document your students' performance after instruction. You also will need to use assessment effectively before and during

Thinking Back/Thinking Forward

Teachers can follow a number of guidelines for effective multicultural teaching. Connect to "Sociocultural Diversity."

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