

# Integrating Educational Technology into Teaching: Transforming Learning Across Disciplines

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For Bill and Paige Wiencke, whose love is, as  
Arthur Clarke said of advanced technology,  
indistinguishable from magic.

—*MDR*

For my father Thomas A. Hughes (1933–2017)  
whose commitment to education and lifelong  
learning is my inspiration.

—*JEH*

# About the Authors



**M. D. Roblyer** was a technology-using professor and contributor to the field of educational technology for 35 years. She authored or coauthored hundreds of books, monographs, articles, columns, and papers on educational technology research and practice. Her other books for Pearson Education include *Starting Out on the Internet: A Learning Journey for Teachers*; *Technology Tools for Teachers: A Microsoft Office Tutorial* (with Steven C. Mills); *Educational Technology in Action: Problem-Based Exercises for Technology Integration*; and the most recent text, *Introduction to Instructional Design for Traditional, Online, and Blended Environments* (2015).

Dr. Roblyer began her exploration of technology's benefits for teaching in 1971 as a graduate student at Pennsylvania State University, one of the country's first successful instructional computer training sites, where she helped write tutorial literacy lessons in the Coursewriter II authoring language on an IBM 1500 dedicated instructional mainframe computer. While obtaining a doctorate in instructional systems at Florida State University, she worked on several major courseware development and training projects with Control Data Corporation's PLATO system. In 1981–1982, she designed one of the early microcomputer software series, *Grammar Problems for Practice*, for the Milliken Publishing Company.

Dr. Roblyer retired in 2015 after having served as teacher, professor, graduate student mentor, doctoral student dissertation chair and committee member, and leader in shaping educational technology's changing role since 1969. She lives in Chattanooga, Tennessee, where she is active in local political and community work. She is married to fellow Florida State alumnus Dr. William R. Wiencke and proud mother of daughter Paige Roblyer Wiencke.



**Joan E. Hughes** has been a technology-using educator and contributor to the educational technology field for more than 25 years and has authored or coauthored more than 100 journal articles, book chapters, proceedings, research conference papers, and practitioner conference papers worldwide.

After earning a bachelor of arts degree in English from Pomona College, she began working in the educational technology field as an elementary and middle school computer teacher in Silicon Valley area of California in the early 1990s. She presented often at the CUE Conference (known then as Computer-Using Educators) and coauthored her first book, *The CompuResource Book*, a collection of technology-supported lessons. Later, she pursued her doctorate in educational psychology with emphasis on cognition and technology at Michigan State University where she taught courses for preservice teachers in Michigan and inservice teachers internationally in Korea, Japan, Thailand, and England. Her earliest research developed the concept of technological pedagogical content knowledge (TPCK), a theory generated from case studies of English teachers' learning and use of technologies in schools. This theory has been adapted and adopted widely.

Currently, Dr. Hughes is Associate Professor of Learning Technologies at The University of Texas at Austin where she conducts research and teaches about how teachers and K–12 students use technologies in and outside the classroom for subject-area learning and how school leaders support classroom technology integration. She serves on editorial and review boards for several teaching and technology journals and has contributed to leadership of technology-related special interest groups. She is highly supportive of her students' educational objectives and has guided 47 doctoral and 45 master of arts and master of education degree students to complete dissertations, theses, or reports.

She is married to Lee Klancher, a writer, photographer, and publisher (Octane Press). They spend time walking their dogs, running, biking, cooking, and eating in Austin and around the world.

# Preface

## About This Book

During a time when nearly everything else is changing rapidly and radically, the mission of this textbook has remained steady and consistent: to reflect the burgeoning, evolving role of technology in education. The book's 20-year history has always documented new and significant transitions in the role of technology in education, and the eighth edition continues that work. But this edition also reflects a new kind of transition with Joan E. Hughes playing a lead role in the authoring team.

This edition reflects fresh, new perspectives on using technology in teacher learning and leadership, an emphasis on transformative technology integration in the classroom, and content-based technology integration. The text includes four sections that position the reader as a teacher learner and leader of transformative technology integration. The first section provides the historical underpinnings of the field that inform our current practices, the learning theories that shape pedagogy, and a technology integration planning model that leads to technology-supported pedagogy that is responsive to instructional or learning challenges. It provides an extensive review of the mindsets and practices of teacher technology leaders who are problem solvers, use connected learning strategies to continually learn and engage in the profession, build a compelling online professional identity, and employ a personal rationale for using technology in all decision making. The second and third sections introduce the technological resources that support teaching and learning. The second section introduces technologies for general productivity activities and instructional software for learning content. The third section reviews how the web supports teaching and learning. It shares ways to access web-based content and engage in web-based communication, collaboration, design, creation, and making. Ultimately, educators use all these technological resources to build blended or online learning lessons or curricula. The fourth section continues this book's commitment to technology integration in disciplinary content areas with a chapter specific to the following content areas: special education; English and language arts (ELA); second and foreign languages; science, technology, engineering, and mathematics (STEM); social studies; music and art; and physical and health education. We go well beyond describing the technical features and capabilities of 21st-century technology tools to focus steadfastly on the research-based teaching and learning strategies that these resources can support in content areas.

Across all eight editions of this book, we have strived to develop an enlightened view of technology in education by using the following guidelines on best practices in matching the needs of the educational community with technology's capabilities.

- **Good pedagogy comes first.** Our experience with educational technologies has shown more clearly than ever that the interaction between teachers and students remains an essential quality of effective education. This textbook proposes that technologies are, above all, channels for helping teachers communicate better with students—ways of making their instructional relationships more meaningful and productive. Technologies can make good teaching even better; it cannot make bad teaching good. Consequently, technology-using teachers can never be forces for improved education unless they are first and foremost informed, knowledgeable shapers of their craft. Before integrating technology into their teaching, educators must know a great deal, for example, about why there are different views on appropriate teaching strategies, how societal factors and learning theories have shaped these views, and how each strategy can address differing needs.

- **Technology is us.** Rather than seeing technology as some foreign invader here to confuse and complicate the simple life of the past, teachers can recognize that technology is very much a response to overcoming obstacles that stand in the way of a better, more productive way of life. Technology encompasses the tools we fashion and the ways we choose to use them to solve problems in our environment. Turmoil will accompany the transitions as teachers adapt to the new environment that teachers have a large role in creating. But technology is, by definition, intended to be part of society's path to a better life rather than an obstacle in its way.
- **We control how technology is used in education.** Finally, we must recognize the truth of Peter Drucker's statement: "The best way to predict the future is to create it." Both individual teachers and teaching organizations must see themselves as enlightened shapers of the future. Each teacher must help to articulate the vision for what the future of education should look like; each should learn the knowledge, attitudes, and disposition that will help realize that vision.

## What's New in the Eighth Edition

Best known for its technology integration strategies grounded in strong research, the eighth edition of *Integrating Educational Technology into Teaching: Transforming Learning Across Disciplines* offers a total technology integration framework across all content areas. It also gives teachers practice with technology resources as they learn how to incorporate technology to support curriculum in ways that transform instruction and learning. And as usual, this edition includes additions that reflect changes in the field of educational technology.

- **NEW!** All chapters' learning outcomes are mapped to the applicable ISTE Standards for Educators (2017). All technology integration example lessons indicate the ISTE Standards for Students (2016) that are addressed within them.

Chapter Learning Outcomes Address the 2017 ISTE Standards for Educators

Chapter	1 – Learner	2 – Leader	3 – Citizen	4 – Collaborator	5 – Designer	6 – Facilitator	7 – Analyst
Chapter 1	X	X	X	X	X	X	
Chapter 2	X	X			X		
Chapter 3	X	X	X	X			
Chapter 4	X	X	X	X	X	X	X
Chapter 5	X	X		X	X	X	X
Chapter 6	X	X	X	X	X	X	
Chapter 7	X	X	X	X	X	X	
Chapter 8	X	X	X	X	X	X	X
Chapter 9	X	X	X	X	X	X	X
Chapter 10	X	X	X	X	X	X	X
Chapter 11	X	X	X	X	X	X	X
Chapter 12	X	X	X	X	X	X	X
Chapter 13	X	X	X	X	X	X	X
Chapter 14	X	X	X	X	X	X	X
Chapter 15	X	X	X	X	X	X	X

- **NEW!** Chapters 1 through 3 have been updated to provide the research, theory, and pedagogical foundations for teachers to learn, plan, and lead transformative technology integration in their classrooms and schools.
- **NEW!** Chapter 2 introduces the Turn-around Technology Integration Pedagogy and Planning (TTIPP) model and the Replacement, Amplification, and Transformation (RAT) assessment model, which help teachers plan and implement classroom

technology integration. Each chapter opens with a detailed Technology Integration in Action scenario and ends with a Technology Integration Workshop, both of which incorporate the TTIPP model and RAT assessment processes and require learners to apply them.

- **NEW!** Chapter 3 is a new chapter focused on teacher learning and teacher leadership for technology integration, which specifically address the first two ISTE Standards for Educators (2017), Learner and Leader. The chapter highlights the mindsets of leaders, connected learning, online professional identity, and the need for a personal rationale for using technology in teaching.
- **NEW!** Chapters 4 through 7 have been reorganized to sequentially introduce technology and web-based resources for teaching and learning. Chapter 8 focuses on blended and online (virtual) learning pedagogy. Teachers can select and incorporate technology resources introduced in the preceding Chapters 4 through 7 to support their digital blended or online instruction.
- **NEW!** Each discipline-specific chapter (Chapters 9 through 15) culminates by offering strategies for continued teacher learning and leadership in content-specific integration. Each includes a rubric that teachers can use to direct and self-assess their growth in technology integration and suggested Twitter hashtags to follow.
- **UPDATED!** Experts in each of the content areas (in Chapters 9 through 15) have updated each **Top Ten Must-Have Technologies** and present apps that are widely used in each discipline area; examples help educators see the role these tools are beginning to play in education.
- **UPDATED!** All chapters provide updated research and illustrate how new technology resources and/or strategies are being used in the classroom.

## Key Content Updates by Chapter

- **Chapter 1.** This chapter includes a revised definition of *integrating educational technology* that aligns with the TTIPP model introduced in Chapter 2 and is used throughout the book. The foundations of educational technology were updated to include learning sciences and the current era of the personalization of education and adaptive learning. The most current ISTE Standards for Educators (2017) and Students (2016) are included as is a description of the TPACK framework of teacher knowledge, including examples of the knowledge in practice from Dr. Hughes' most recent research.
- **Chapter 2.** This chapter now emphasizes transformative technology integration through revision of the previous TIP model into the TTIPP model, which begins with problems of practice; involves teachers in understanding the technological resources of their learners, families, and schools as assets for planning; and includes the RAT assessment model for determining relative advantage of technology in lessons.
- **Chapter 3.** This all-new chapter positions teachers to be lifelong learners and technology leaders for change. The chapter describes the mindsets of teacher leaders; positions teachers as connected educators who participate in connected learning communities; encourages teachers to build a compelling and consistent online professional identity; and explains how to build a personal rationale for using technology in teaching.
- **Chapter 4.** This chapter (previously Chapters 4 and 5) opens with a new section on technology device and software configurations in classrooms and schools and their capabilities in supporting different pedagogical approaches. A new definition is used to describe technology used for productivity: Hardware and software tools that do not contain predesigned curricular content; instead, teachers and students

bring content to their activities with these resources. Productivity tools are used for writing and publishing; representing ideas or content using multimedia; collecting and analyzing data; planning and organizing; generating instructional materials and forms; and assessing student products.

- **Chapter 5.** This chapter (previously Chapter 3) introduces instructional software with an updated definition: preprogrammed content material that often is instructionally sequenced. The chapter includes a new section on strategies for selecting appropriate instructional software.
- **Chapter 6.** The chapter was reorganized to introduce the web and its use as a resource for archived, immersive, or live content. It includes broadened descriptions of the web, online safety and digital citizenship, and web search strategies. It has new sections on web content (archived, immersive, and live), open educational resources (OER), and an introduction to Creative Commons. The new final section introduces evaluation criteria for determining the ease or difficulty of integrating web content into instruction.
- **Chapter 7.** This chapter (including some content from the previous edition's Chapter 6) introduces web resources that support communication, collaboration, design, creation, and making. Key new additions include content curation; multimodal creative expressions; digital publishing, storytelling, and book making; and a computer programming section describing computational thinking, coding, visual programming, designing and developing games and apps, building in virtual worlds, building augmented reality, and making.
- **Chapter 8.** This chapter (previously Chapters 7 and 8) provides updated definitions, benefits, challenges, examples, and integration strategies of blended and online (virtual) learning and describes how readers can use the content in preceding Chapters 1 through 7 to build blended or online learning experiences. Key additions include descriptions of teacher competencies for blended/online instruction, characteristics of successful online courses, and national standards for quality online courses.
- **Chapter 9.** This chapter (formerly Chapter 15) was repositioned in the book to emphasize its unique role cutting across teaching and learning activities in all school content areas to meet all learners' needs. The introduction to special education reflects current laws and the current distribution of students with disabilities. The chapter also reviews additional ways in which mobile devices are used as assistive technologies and includes a section that helps readers learn how to select best technology apps for students with disabilities.
- **Chapter 10.** The key updates in this chapter (formerly Chapter 9) include technological possibilities for literacy practices in relation to broader mobile device access at home and at schools and expanding social media activities. It also emphasizes the need for digital literacy and digital citizenship among teachers and youth.
- **Chapter 11.** The predominant updates in this chapter (formerly Chapter 10) reveal the most recent national characteristics of English learners, responsibilities and strategies for language learning by all content-area teachers, and the latest technological strategies and innovations that support language learning through computer and mobile technologies.
- **Chapter 12.** The first section of this updated chapter (previously Chapter 11) now introduces the science, technology, engineering, and mathematics (STEM) fields, articulates how teachers can integrate STEM, and sets forth an integrated view of these content areas. The chapter now includes new sections on the challenges of and technology integration strategies for engineering to complement the science and math sections.

- **Chapter 13.** This chapter (previously Chapter 12) emphasizes the competing advantages and challenges of web-based content: plentiful access to source materials in every social studies topic area but also widespread inaccurate and misleading information and hateful and malicious falsehoods posing as informed facts. Thus, the importance of digital literacy and digital citizenship thread throughout the chapter. Finally, it includes a new section on the integration of social media.
- **Chapter 14.** Content in this chapter (previously Chapter 13) reflects recent changes in the standards by the National Association for Music Education (NAfME) and the National Visual Arts Standards. Key updates include the influence of Bring Your Own Device (BYOD) on music and art teachers' options and new technological innovations, such as those supporting live performance and increasing access to online artwork.
- **Chapter 15.** This chapter (previously Chapter 14) has been updated and reorganized around the Whole School, Whole Community, Whole Child (WSCC) model, notably introducing technology integration strategies for physical activity and healthy living: (1) before and after school, (2) during school, (3) with staff involvement, and (4) with family and community engagement.

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- **Video Examples.** Each chapter includes multiple video demonstrations or commentaries from practitioners in the field that illustrate the concepts introduced in the chapter. Readers can view the technology-supported practices in action or identify key practitioner-based strategies for success.
- **Application Exercises.** Each chapter has several interactive formative assessment exercises that call on readers to apply their developing knowledge and receive expert feedback. For example, readers interpret key strategies from a video-based interview or classroom practice, fill in the blank with missing concepts in text-based scenarios, identify or move concepts within a visual-based representation, view multimedia examples, or match concepts with drag-and-drop text.
- **Shared Writing.** Each chapter includes at least one chance for readers to contemplate a unique scenario-based situation related to the chapter content and share their thinking through a collaborative Shared Writing exercise.
- **Interactive Glossary.** Bolded key terms in the text are linked to glossary definitions, enabling students to read and comprehend with clarity without skipping concepts they do not understand.

## Core Principles of this Text

The purpose of this book is to show how teachers can shape the future of technology in education. How teachers respond to this challenge is guided by how the authors see it helping educators accomplish their own informed vision of what teaching and learning should be. Our approach to accomplishing this rests on four premises:

- 1. Integrating educational technology should be based in learning theory, teaching practice, and curriculum.** There is no shortage of innovative ideas in the field of educational technology; new and interesting methods come forth about as often as new and improved gadgets. Those who would build on the knowledge of the past should know why they do what they do as well as how to do it. Thus, various technology-based integration strategies are linked to well-researched theories of learning, and we have illustrated them with examples of successful practices based on these theories.
- 2. Uses of technology should match specific teaching and learning needs.** Some technology resources have the power to improve teaching and learning. Therefore, each resource should be examined for its unique qualities and potential benefits for teachers and students. Teachers should not use a tool simply because it is new and available; each integration strategy should be matched to a recognized need. Teachers should not oppose experimentation but advocate for informed use.
- 3. Old integration strategies are not necessarily bad; new strategies are not necessarily good.** As technologies change and evolve at lightning speed, there is a tendency to throw out older teaching methods with older machines. Sometimes this is a good idea; sometimes it would be a loss. Each of the integration strategies recommended in this book is based on methods with proven usefulness to teachers and students. Some of the strategies are based on directed methods that have been used for some time; other strategies are based on the newer, constructivist learning models. Each is recommended on the basis of its usefulness toward solving learning needs rather than its age.
- 4. A combination of technological, pedagogical, and content knowledge is necessary.** This textbook maintains that teachers not only need to know the content they are teaching and good pedagogical strategies for connecting students with content but also must recognize how to integrate technology into pedagogy to achieve greatest impact on desired outcomes. In other words, teachers need what the field now refers to as Technological Pedagogical Content Knowledge, TPACK or TPACK.

The goal of this edition is for teachers to see more clearly their role in shaping the future of technology in education. This book illustrates that great education means employing technologies to fulfill the vision they make possible—a worldwide social network and a global community that learns and grows together.

# Features of this Text

For the eighth edition, the authors maintain a cohesive, comprehensive technology integration framework that builds on strong research and numerous integration strategies. This Technology Integration Framework achieves the following goals:

## Introduces Teachers to Technology Integration

### Technology Integration in Action: Producing Authentic Historical Interviews

**GRADE LEVEL:** 8–12  
**CONTENT AREA/TOPIC:** U.S. History  
**LENGTH OF TIME:** Two weeks

#### PHASE 1 Analysis of Learning and Teaching Assets and Needs

##### Step 1: Analyze problems of practice (POPs)

Like many social studies teachers, Mr. Engle sought to create learning experiences where students could make meaningful connections between the past and present. In past years, students had read accounts of the Holocaust and Rwandan genocides, but he was not sure that his students really understood the experiences of people during these events. He wanted to better humanize historical events that might contribute to his students experiencing a richer vision of historical events. He noticed some parallels to current events too, when police and Immigration and Customs Enforcement (ICE) started arresting and detaining people suspected of living in the United States without documentation—even

- **Technology Integration in Action** examples located at the beginning of Chapters 2 through 15 are classroom-based scenarios that provide a classroom context for chapter content by focusing on the selection and use of specific technology within a classroom environment. Each walks the reader through the steps of the Turnaround Technology Integration Pedagogy and Planning (TTIPP) Model and lesson RATification using the Replacement, Amplification, and Transformation (RAT) Assessment model. These classroom-based scenarios are tied specifically to the chapter’s learning outcomes.

- **Adapting for Special Needs** features give teachers alternative software and technology suggestions to consider for use in supporting students with special needs.

### Box 2.1: Adapting for Special Needs: Universal Design for Learning

Universal design for learning (UDL) is a framework that has important implications for technology use in the classroom. UDL proactively addresses academic diversity through strategies that offer students multiple ways to access, engage, and demonstrate their mastery of the learning outcomes. One of the mantras of UDL is that instructional design deliberately created for individuals with disabilities often provides significant benefits to all students. The essence of UDL involves providing three components:

- Multiple means of representation to give learners various ways of acquiring information and knowledge
- Multiple means of engagement to tap into learners’ interests, to challenge them appropriately, and to motivate them to learn
- Multiple means of expression to provide learners with alternatives for demonstrating what they know

Traditionally, when educators fail to recognize that 25–50% of the students in their classroom might not read at grade level, they distribute textbooks that have a readability level *above* grade level. However, using the principle of multiple means of representation, an educator plans instruction to provide access to digital text so that students can manipulate the physical nature of the text (e.g., change the font size, color contrasts), as well as alter the cognitive difficulty by using tools such as text-to-speech (e.g., Natural Reader website) or text-summarization (e.g., Text Compactor website). Learn more about universal design for learning in order to understand its applications for your own classroom by visiting the Center for Applied Special Technology or CAST website.

—Contributed by Dave Edyburn

### Video Example 12.5 High School Students Work with Robots

In this video, a high school student talks about what he learned and experienced from his collaborative work on a team to build a robot.



- **Video Examples** are located throughout the chapters to visually and aurally represent technology integration strategies and challenges existing in schools today.

## Helps Teachers Plan for Effective Technology Integration

### Technology Integration

Example 11.1

**TITLE:** A Visit to My Favorite Museum!

**CONTENT AREA/TOPIC:** EL or any major foreign language

**GRADE LEVELS:** 7–12

**ISTE STANDARDS+S:** Standard 1—Empowered Learner; Standard 3—Knowledge Constructor; Standard 4—Innovative Designer; Standard 5—Computational Thinker; Standard 6—Creative Communicator; Standard 7—Global Communicator

**CCSS:** CCSS.MATH.PRACTICE.MP5, CCSS.MATH.CONTENT.7.RP.A.2, CCSS.MATH.CONTENT.HSN.Q.A.1, CCSS.MATH.CONTENT.HSN.Q.A.3, CCSS.MATH.CONTENT.8.EE.C.7

**WORLD-READINESS STANDARDS FOR LEARNING LANGUAGES:** Communication (Interpretive); Cultures (Relating Cultural Products to Perspectives)

**DESCRIPTION:** Students choose a target museum to “visit” in a country in which a national language is the target language they want to learn. They answer questions about the museum of their choice, including its name, telephone number, hours of operation, entrance fees, and some of the major artwork that can be found there. Students can also use Google Maps or Google Earth to develop a sense of the area surrounding the museum. Using word processing software, they create a poster or brochure for the museum that illustrates an itinerary for a day visiting the museum and the surrounding area (use the *New York Times* Travel Section *36 Hours in ...* feature as an example). In the target language, students use information they have collected, identify nearby sites or restaurants to include in the itinerary, and use images available for reuse (Creative Commons licensed or public domain). Students identify the country’s currency, use an exchange rate website to determine the cost of the visit in U.S. dollars, and include that information in the poster or brochure.

**SOURCE:** Based on a concept in the Museums, Museums, Museums! lesson plan by Carol Parris and Julie Pinzás, previously online at the California Language Teachers’ Association’s (CLTA) website, <http://www.clta.net/lessons>.

- **Summaries** at the end of each chapter tie back to the learning outcomes and act as study aids by condensing and reviewing critical chapter content.

- **Technology Integration Examples (TIEs)** in Chapters 3 through 15 offer numerous technology lesson ideas that can be incorporated into lesson planning across the curriculum. Each lesson suggestion is correlated to the ISTE National Educational Technology Standards for Students (2016) and Common Core State Standards.

### Chapter 3 Summary

#### 1. Teacher Leadership

- Teacher leaders are classroom teachers who engage in leadership activities outside their classroom that identify educational challenges that they work to solve.
- Teacher leadership is enabled by three crucial mind sets: creativity, agency, and community.
- Benefits of being a teacher leader include better relationships among colleagues, confidence and empowerment, growth as a professional and in professionalism within the school, and expansion of leadership activities.
- Challenges of being a teacher leader include stress, lack of time, too many tasks, suffering relationships with colleagues, and resistant colleagues.

#### 2. The Connected Educator

- Connected educators are teachers who engage in learning with others online via networked

status, feedback, access to others, personalized learning, and relationships. Challenges of being a connected educator include need for the Internet and time.

#### 3. Online Teacher Identity

- Teachers develop a digital footprint when using networked technologies and need to manage their online activities to create a consistent and compelling online identity.
- Teachers must consult their school’s policies related to technology and online activity to understand important guidelines affecting their online activity. Special attention should be given to data privacy, digital citizenship, and teacher–student connections.
- Connected educators can manage and shape their online activity to build a professional online identity by determining their strengths; building consistent, professional digital presence; and using social networking to publicize their expertise and engage

## Helps Teachers Practice Technology Integration

- **A Teacher Growth Section** located at the end of each discipline-specific chapter (Chapters 9 through 15) offers strategies for continued teacher learning and leadership in content-specific technology integration. It also includes a rubric that teachers can use to self-assess and direct their growth in technology integration and suggests Twitter hashtags to follow.
- **A Technology Integration Workshop** located at the end of every chapter includes hands-on, interactive activities that connect chapter content to real-life practice. Each contains the following:
  - **Apply What You Learned** exercises, which call for students to reread the Technology Integration in Action example that opened the chapter; identify another, different technology resource possibility to solve the problem of practice set within the example; and complete a RAT matrix analysis to determine the new technology resource’s potential for changing instruction, learning, and/or curriculum.
  - **Technology Integration Lesson Planning: Evaluating Lesson Plans** exercises provide students the opportunity and resources to evaluate a set of technology integration lessons.
  - **Technology Integration Lesson Planning: Creating Lesson Plans with the TTIPP model** activity asks students to create a new technology-supported lesson plan that employs a technology resource introduced in the chapter to solve a problem of practice. Students do so by implementing the TTIPP model and are encouraged to share their lessons.
  - **Technology Lesson Plan Evaluation Checklist and the RAT matrix** introduced in Chapter 2 are used throughout the workshop activities.

## Support Materials for Instructors

The following resources are available for instructors to download on [www.pearson-highered.com/educators](http://www.pearson-highered.com/educators). Instructors enter the author or title of this book, select this particular edition of the book, and then click on the “Resources” tab to log in and download textbook supplements.

### Instructor’s Resource Manual and Test Bank (978-0-13-474640-1)

The *Instructor’s Resource Manual and Test Bank* includes a wealth of interesting ideas and activities designed to help instructors teach the course. Each chapter contains learning outcomes, key terms, key concepts, and group activities as well as a comprehensive test bank containing multiple-choice and essay questions.

### PowerPoint Slides (978-0-13-474626-5)

Designed for teachers using the text, the *PowerPoint™ Presentation* consists of a series of slides that can be shown as is or used to make handouts. The presentation highlights key concepts and major topics for each chapter.

### TestGen (978-0-13-474639-5)

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

The tests can be downloaded in the following formats:

- TestGen Testbank file — PC
- TestGen Testbank file—MAC
- TestGen Testbank—Blackboard 9 TIF
- TestGen Testbank—Blackboard CE/Vista (WebCT) TIF
- TestGen Testbank—Canvas
- Angel Test Bank (zip)
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— M. D. Roblyer and Joan E. Hughes

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