Instructional Technology and Media for Learning

12th Edition

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About the Authors

Sharon E. Smaldino

Sharon served for many years as a speech therapist and special educator in school districts from Florida to Minnesota. She spent many years working with PK-12 aged deaf and hearing-impaired students in public schools and in residential programs. For several years she worked with hearing impaired students who were placed in a residential program for social and emotional issues. During the time she was working with those students Sharon began a doctoral program at Southern Illinois University-Carbondale with a focus on instructional design and technology integration. Sharon brought her personal computer into her classroom to help her deaf students explore new technology-integrated learning experiences. Following completion of her degree, Sharon started her career as a teacher educator where she focused on working with teacher candidates, faculty, and PK-12 teachers to integrate technology into the learning process. Presenting at state, national, and international conferences, Sharon has become an important voice on applications of technology in the classroom and in distance education. In addition to her teaching, Sharon has written articles for state and national journals, chapters, and books on her primary research interest—effective technology integration in learning. She has worked on the development and implementation of grants that are designed to support teachers to integrate technology into their teaching. Sharon has received several awards for her teaching and professional activities. She has served as a journal editor and has held leadership positions in several state and national professional associations.

Deborah L. Lowther

Deborah has been an educator for over 30 years. For the first seven years of her career she taught middle school science and was highly engaged with providing professional development to teachers within and beyond her district. Because of her desire to work with teachers, she received her PhD in educational technology in 1994 and accepted a faculty position at the University of Memphis in 1995. At the University of Memphis, Deborah served as Department Chair for Instruction and Curriculum Leadership (ICL). The ICL department offers eight initial teacher licensure programs as well as several MS and EdD options. Prior to accepting the chair positon, Deborah served as the senior technology researcher for the Center for Research in Educational Policy, through which she researched PK-12 technology integration issues. She has personally conducted observations in PK-12 classrooms and interviewed students, teachers, and principals in numerous schools across the country. She has used the knowledge and experiences gained through engagement in applied research to develop the iNtegrating Technology for inquiry (NTeQ) Model with Dr. Gary Morrison. This model has been the foundational approach for several high-profile state-level technology initiatives. With regard to scholarship, Deborah has coauthored several books, chapters, and refereed journal articles; presented at numerous national and international conferences; and provided professional development to educational institutions across the nation.

Clif Mims

Clif is a teacher, researcher, author, speaker, and educational consultant specializing in the effective integration of technology with teaching and learning. His teaching career began more than 20 years ago as an elementary and middle school teacher. He also coached basketball and math teams to numerous championships. While earning his

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doctorate in instructional technology at the University of Georgia, Clif began focusing on teacher education and professional development. He is a professor of instructional design and technology at the University of Memphis and is the founding executive direction of the Martin Institute for Teaching Excellence. Clif is both a Project Zero Faculty Fellow and a Future of Learning Fellow at Harvard University. He and his wife have three children.

Preface

About This Book

Instructional Technology and Media for Learning, Twelfth Edition, shows how a complete range of technology and media formats can be integrated into classroom instruction using the ASSURE model for lesson planning. Written from the viewpoint of the teacher, the text shows specifically and realistically how technology and media fit into the daily life of the classroom. This book is intended for educators at all levels who place a high value on learning. Its purpose is to help educators incorporate technology and media into their repertoire—to use them as teaching tools and to guide students in using them as learning tools. We draw examples from elementary and secondary education because we know that instructors in these PK–12 settings have found previous editions of this book useful in their work.

New to This Edition

This edition is necessitated by the amazing pace of innovation in all aspects of technology, particularly in those related to computers and mobile technologies, as well as the Internet. The text has been updated to reflect the accelerating trend toward technology advances and changes in educational use of technology resources. We have combined two former chapters, audio and video, to reflect the multimedia concepts relevant today. The twelfth edition also addresses the interaction among the roles of teachers, technology coordinators, and school media specialists, all complementary and interdependent teams within the school.

- The explanation of the ASSURE model has been revised to be more clear, practical, and focused on PK–12 teaching and learning. Several chapters include ASSURE Classroom Case Study features that show how teachers can effectively integrate technology and media into instruction to augment their students' learning experiences.
- The chapters have been revised with updated information about designing instruction for learning that focuses on current learning standards and learning environments. Every effort has been made to identify the most current technology to support learning, providing an overview of how to use the technologies with students of all ages. We've included end-of-chapter professional development activities that guide the user through teacher performance assessment using technology standards as part of the process.
- We have updated several of the *Taking a Look at Technology Integration* features with examples of how actual classroom teachers use technology to support student learning. The examples place emphasis on integrating the learning standards and learner-centered instructional strategies.
- We have focused on enhancing the use of technology to meet the learning needs of all students in a classroom. With the increase in student diversity, classroom teachers are expected to meet the learning needs of all students. We have expanded the *Technology for All Learners* feature to help consider options that will be useful to facilitate learning experiences for all students in the classroom.
- We have added self-check items throughout each chapter to give the reader opportunities to recall the material just read and make connections to learning experiences. The reader can respond to questions that help them check for understanding. These replace the former end-of-chapter demonstration of professional knowledge exercises that were in previous editions.

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Key Content Updates by Chapter

Specific chapter-by-chapter updates and additions include the following:

- **Chapter 1:** The first chapter reflects an extended discussion of academic and career learning experiences with updates on media and technology integration in classrooms. It includes an overview of effective learning environments. Key components of copyright issues are presented. Video segments offer ideas from the classroom. An updated description of the use of media and technology in instruction is present. An overview of assessment options is provided. Questions and discussion options are embedded throughout the chapter to provide learners with opportunities to explore the topics.
- **Chapter 2:** The chapter provides an updated overview of learning theories and principles of effective instruction. Video examples provide examples of ways that the technology offers support for learning and the embedded questions provide ways for learners to explore their thinking.
- **Chapter 3:** The foundational components of the ASSURE model have been updated and further supported with targeted, short video examples of actual classroom practice. The video examples demonstrate each step of the model and offer higher-level questions to deepen the learning experience.
- **Chapter 4:** Expanded discussion of digital learning environments explores a variety of learning strategies and contexts from a teacher's perspective. New examples, tips, and ideas reflect current classroom use of technology and media.
- **Chapter 5:** This chapter has been updated to align with digital devices used in today's classrooms to enhance learning. Video examples are revised to better demonstrate use of technology in classrooms. We embed new and thought-provoking questions and interactive application exercises throughout to keep readers engaged and increase learning.
- **Chapter 6:** This chapter has been revised to demonstrate the expanded role of Web 2.0 and social media in today's schools. New terminology aligns with current apps and digital devices used to support learning. The video examples provide insight into the ideas explored within the chapter. The embedded questions provide ways to engage the learners as they read the chapter.
- **Chapter 7:** An updated description of planning and implementing instruction at a distance is presented. An overview of resources to enhance learning opportunities in distance settings is included. Video of classroom use of distance learning provides examples within the chapter and, along with the embedded questions and discussion points, serves to guide the reader towards understanding the topics.
- **Chapter 8 (formerly chapters 8 and 9):** Chapters are combined, with integrated material covering four types of multimedia used to enhance learning: audio, video, text, and visuals. Integration examples are updated to illustrate ways new technologies and media are used in the classroom. Selection Rubrics for each type of media are embedded for quick access.
- **Chapter 9 (formerly chapter 10):** The Preparing for Tomorrow's Challenges chapter is fully updated with new Learning Outcomes, exciting video examples, and cutting-edge practices emerging on the horizon. Among the new topics are: coding as literacy, transdisciplinary learning, artificial intelligence, and augmented reality. The chapter also provides a new discussion of future ready professional development.

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  - **Video examples within ASSURE Case Study boxes** offer students the opportunity to see key technologies at work, putting the ASSURE model into practice in different classrooms throughout the text.
  - **Application Exercises** are interactive activities that allow students to test their understanding of skills and concepts throughout each chapter, using formative and summative assessment tools. These include fill-in-the blank, drag-and-drop tables, and journal exercises.
  - **Interactive Check Your Understanding items** are multiple choice assessment questions that test students' knowledge of the content they have just read at the end of each major section. Feedback for the correct answer is provided.
  - **Interactive Shared Writing activities** allow students to answer questions and share their responses with others.
- **Interactive Glossary** The material links bolded key terms in the text to glossary definitions, enabling students to read and comprehend with clarity without skipping concepts they do not understand.

Our Approach

We share a number of convictions that underlie this edition. First, we believe in an *eclectic* approach to instruction. Advocates cite an abundance of theories and philosophies in support of different approaches to instruction—behaviorist, cognitivist, constructivist, and social-psychological. We view these theoretical positions as differing *perspectives*— different vantage points—from which to examine the complex world of teaching and learning. We value each of them and feel that each is reflected in the guidance we offer.

Second, we have a balanced posture regarding the role of technology in instruction. Because of this perspective, we consider each technology in light of its advantages, limitations, and range of applications. No technology can be described solely as being either "good" or "bad," so we strive to give a balanced treatment to a range of technologies and media resources.

Third, we believe that technology can best be integrated into instruction when viewed from a learner's perspective. Therefore, throughout the book we attempt to approach technology and media solutions in terms of a teacher's day-to-day challenges and to avoid technical jargon as much as possible. Our examples deal with everyday teaching issues in a range of content areas.

The ASSURE Model for Technology Integration

To ensure our approach is applied effectively, we created the ASSURE Model for planning that included considerations for technology integration. This model presents a procedure that helps teachers consider appropriate technology that aligns with content standards while meeting the learning needs of all of their students. We have further refined this model in this current edition.

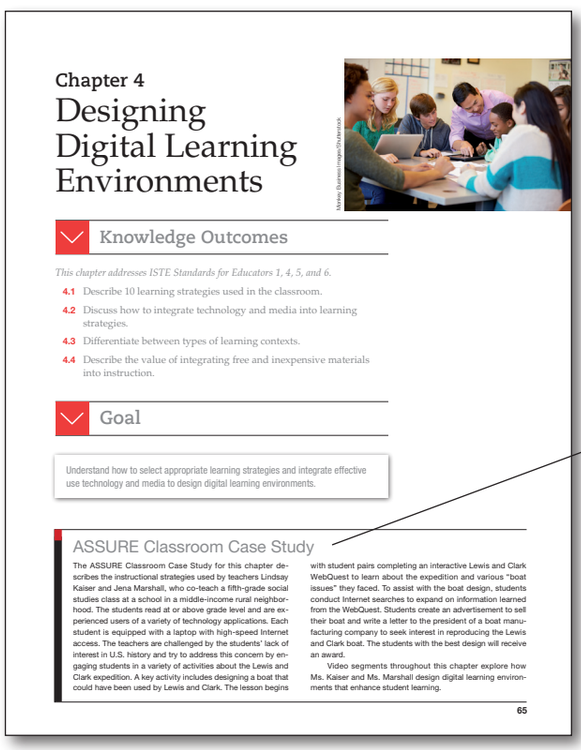
Focus on Professional Development

To help readers develop their ongoing professional knowledge and skills with regard to effectively using technology and media for learning, we have expanded the **Professional Development** feature.

In the first section, **Demonstrate Professional Skills,** readers integrate their learning through activities that are aligned with the ISTE Standards for Educators. The final section, **Building Your Professional Portfolio,** includes three parts: **Creating My Lesson, Reflecting on My Lesson,** and **Enhancing My Lesson.** These are also linked to the ISTE Standards for Educators.

- **Creating My Lesson** asks readers to select their own topics and settings for developing lessons that integrate the technology and media discussed in the chapter. Chapter-specific ideas help readers make decisions to create their own lesson plan using appropriate instructional strategies, technology, and media.
- **Reflecting on My Lesson** prompts readers to reflect on their lesson design, the process used to develop it, and different types of students who could benefit from it. Readers are also asked to reflect on what they learned about the process of matching audience, content, strategies, technology, media, and materials.
- **Enhancing My Lesson** asks the reader to describe other strategies, technologies, media, and materials that could enhance the lesson. The reader addresses how the lesson could be enhanced to meet the diverse needs of learners, including students who already possess the knowledge and skills targeted in the lesson plan.

Additional Features


Chapter 4

Designing Digital Learning Environments

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Knowledge Outcomes

This chapter addresses ISTE Standards for Educators 1, 4, 5, and 6.

4.1 Describe 10 learning strategies used in the classroom.

4.2 Discuss how to integrate technology and media into learning strategies.

4.3 Differentiate between types of learning contexts.

4.4 Describe the value of integrating free and inexpensive materials into instruction.

Goal

Understand how to select appropriate learning strategies and integrate effective use technology and media to design digital learning environments.

ASSURE Classroom Case Study

The ASSURE Classroom Case Study for this chapter describes the instructional strategies used by teachers Lindsay Kaiser and Jena Marshall, who co-teach a fifth-grade social studies class at a school in a middle-income rural neighborhood. The students read at or above grade level and are experienced users of a variety of technology applications. Each student is equipped with a laptop with high-speed Internet access. The teachers are challenged by the students' lack of interest in U.S. history and try to address this concern by engaging students in a variety of activities about the Lewis and Clark expedition. A key activity includes designing a boat that could have been used by Lewis and Clark. The lesson begins with student pairs completing an interactive Lewis and Clark WebQuest to learn about the expedition and various "boat issues" they faced. To assist with the boat design, students conduct Internet searches to expand on information learned from the WebQuest. Students create an advertisement to sell their boat and write a letter to the president of a boat manufacturing company to seek interest in reproducing the Lewis and Clark boat. The students with the best design will receive an award.

Video segments throughout this chapter explore how Ms. Kaiser and Ms. Marshall design digital learning environments that enhance student learning.

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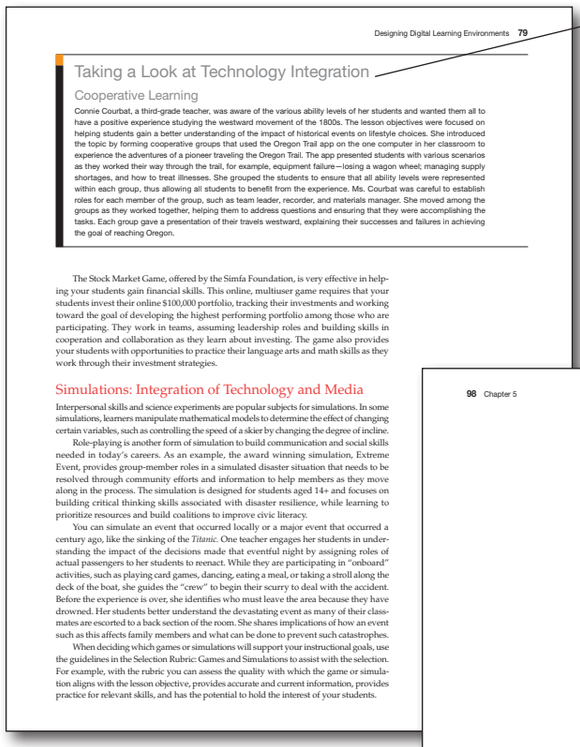
ASSURE Classroom Case Study

Chapter opening "ASSURE Classroom Case Studies" (in Chapters 3 through 9) each presents a video clip of a specific classroom that will be revisited periodically throughout the chapter in the "ASSURE Case Study Reflections." These are brief notes and reflection questions that extend the opening case study by addressing the questions that a teacher may face when considering technology integration in the context of specific chapter content. At the end of the chapter, the "ASSURE Lesson Plan" provides a fuller version of the instructional or classroom situation outlined at the beginning of the chapter and offers a possible solution.



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Taking a Look at Technology Integration

Cooperative Learning

Connie Courbat, a third-grade teacher, was aware of the various ability levels of her students and wanted them all to have a positive experience studying the westward movement of the 1800s. The lesson objectives were focused on helping students gain a better understanding of the impact of historical events on lifestyle choices. She introduced the topic by forming cooperative groups that used the Oregon Trail app on the one computer in her classroom to experience the adventures of a pioneer traveling the Oregon Trail. The app presented students with various scenarios as they worked their way through the trail, for example, equipment failure—losing a wagon wheel; managing supply shortages, and how to treat illnesses. She grouped the students to ensure that all ability levels were represented within each group, thus allowing all students to benefit from the experience. Ms. Courbat was careful to establish roles for each member of the group, such as team leader, recorder, and materials manager. She moved among the groups as they worked together, helping them to address questions and ensuring that they were accomplishing the tasks. Each group gave a presentation of their travels westward, explaining their successes and failures in achieving the goal of reaching Oregon.

The Stock Market Game, offered by the Simfa Foundation, is very effective in helping your students gain financial skills. This online, multiuser game requires that your students invest their online $100,000 portfolio, tracking their investments and working toward the goal of developing the highest performing portfolio among those who are participating. They work in teams, assuming leadership roles and building skills in cooperation and collaboration as they learn about investing. The game also provides your students with opportunities to practice their language arts and math skills as they work through their investment strategies.

Simulations: Integration of Technology and Media

Interpersonal skills and science experiments are popular subjects for simulations. In some simulations, learners manipulate mathematical models to determine the effect of changing certain variables, such as controlling the speed of a skier by changing the degree of incline.

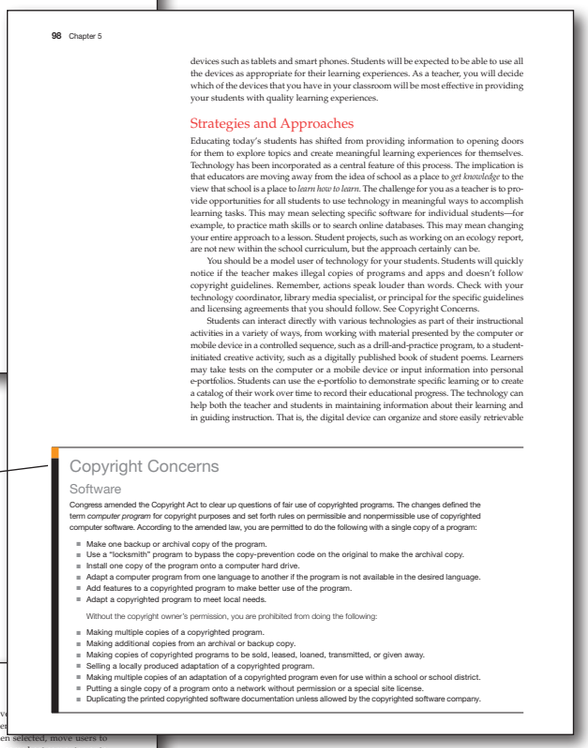
Role-playing is another form of simulation to build communication and social skills needed in today's careers. As an example, the award winning simulation, Extreme Event, provides group-member roles in a simulated disaster situation that needs to be resolved through community efforts and information to help members as they move along in the process. The simulation is designed for students aged 14+ and focuses on building critical thinking skills associated with disaster resilience, while learning to prioritize resources and build coalitions to improve civic literacy.

You can simulate an event that occurred locally or a major event that occurred a century ago, like the sinking of the *Titanic*. One teacher engages her students in understanding the impact of the decisions made that eventful night by assigning roles of actual passengers to her students to reenact. While they are participating in "onboard" activities, such as playing card games, dancing, eating a meal, or taking a stroll along the deck of the boat, she guides the "crew" to begin their scurry to deal with the accident. Before the experience is over, she identifies who must leave the area because they have drowned. Her students better understand the devastating event as many of their classmates are escorted to a back section of the room. She shares implications of how an event such as this affects family members and what can be done to prevent such catastrophes.

When deciding which games or simulations will support your instructional goals, use the guidelines in the Selection Rubric: Games and Simulations to assist with the selection. For example, with the rubric you can assess the quality with which the game or simulation aligns with the lesson objective, provides accurate and current information, provides practice for relevant skills, and has the potential to hold the interest of your students.

Taking a Look at Technology Integration

These miniature case studies of technology and media applications demonstrate how teachers are using technology in a variety of settings. Like the ASSURE Classroom Case Study, they show technology and media use *in* context.



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devices such as tablets and smart phones. Students will be expected to be able to use all the devices as appropriate for their learning experiences. As a teacher, you will decide which of the devices that you have in your classroom will be most effective in providing your students with quality learning experiences.

Strategies and Approaches

Educating today's students has shifted from providing information to opening doors for them to explore topics and create meaningful learning experiences for themselves. Technology has been incorporated as a central feature of this process. The implication is that educators are moving away from the idea of school as a place to *get knowledge* to the view that school is a place to *learn how to learn*. The challenge for you as a teacher is to provide opportunities for all students to use technology in meaningful ways to accomplish learning tasks. This may mean selecting specific software for individual students—for example, to practice math skills or to search online databases. This may mean changing your entire approach to a lesson. Student projects, such as working on an ecology report, are not new within the school curriculum, but the approach certainly can be.

You should be a model user of technology for your students. Students will quickly notice if the teacher makes illegal copies of programs and apps and doesn't follow copyright guidelines. Remember, actions speak louder than words. Check with your technology coordinator, library media specialist, or principal for the specific guidelines and licensing agreements that you should follow. See Copyright Concerns.

Students can interact directly with various technologies as part of their instructional activities in a variety of ways, from working with material presented by the computer or mobile device in a controlled sequence, such as a drill-and-practice program, to a student-initiated creative activity, such as a digitally published book of student poems. Learners may take tests on the computer or a mobile device or input information into personal e-portfolios. Students can use the e-portfolio to demonstrate specific learning or to create a catalog of their work over time to record their educational progress. The technology can help both the teacher and students in maintaining information about their learning and in guiding instruction. That is, the digital device can organize and store easily retrievable

Copyright Concerns

Software

Congress amended the Copyright Act to clear up questions of fair use of copyrighted programs. The changes defined the term *computer program* for copyright purposes and set forth rules on permissible and nonpermissible use of copyrighted computer software. According to the amended law, you are permitted to do the following with a single copy of a program:

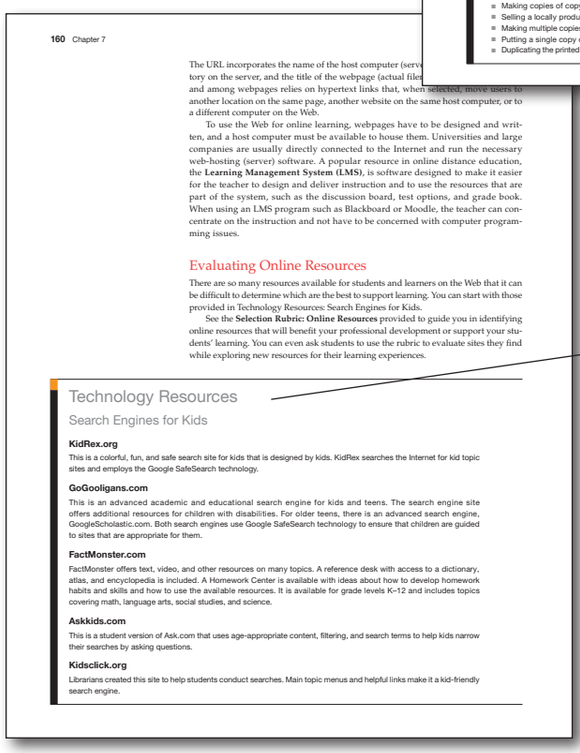
- Make one backup or archival copy of the program.
- Use a "locksmith" program to bypass the copy-prevention code on the original to make the archival copy.
- Install one copy of the program onto a computer hard drive.
- Adapt a computer program from one language to another if the program is not available in the desired language.
- Add features to a copyrighted program to make better use of the program.
- Adapt a copyrighted program to meet local needs.

Without the copyright owner's permission, you are prohibited from doing the following:

- Making multiple copies of a copyrighted program.
- Making additional copies from an archival or backup copy.
- Making copies of copyrighted programs to be sold, leased, loaned, transmitted, or given away.
- Selling a locally produced adaptation of a copyrighted program.
- Making multiple copies of an adaptation of a copyrighted program even for use within a school or school district.
- Putting a single copy of a program onto a network without permission or a special site license.
- Duplicating the printed copyrighted software documentation unless allowed by the copyrighted software company.

Copyright Concerns

This feature provides an integrated discussion of copyright issues linked to specific chapter content.



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The URL incorporates the name of the host computer (serv
tory on the server, and the title of the webpage (actual file
and among webpages relies on hypertext links that, when selected, move users to another location on the same page, another website on the same host computer, or to a different computer on the Web.

To use the Web for online learning, webpages have to be designed and written, and a host computer must be available to house them. Universities and large companies are usually directly connected to the Internet and run the necessary web-hosting (server) software. A popular resource in online distance education, the **Learning Management System (LMS)**, is software designed to make it easier for the teacher to design and deliver instruction and to use the resources that are part of the system, such as the discussion board, test options, and grade book. When using an LMS program such as Blackboard or Moodle, the teacher can concentrate on the instruction and not have to be concerned with computer programming issues.

Evaluating Online Resources

There are so many resources available for students and learners on the Web that it can be difficult to determine which are the best to support learning. You can start with those provided in Technology Resources: Search Engines for Kids.

See the **Selection Rubric: Online Resources** provided to guide you in identifying online resources that will benefit your professional development or support your students' learning. You can even ask students to use the rubric to evaluate sites they find while exploring new resources for their learning experiences.

Technology Resources

Search Engines for Kids

KidRex.org

This is a colorful, fun, and safe search site for kids that is designed by kids. KidRex searches the Internet for kid topic sites and employs the Google SafeSearch technology.

GoGooligans.com

This is an advanced academic and educational search engine for kids and teens. The search engine site offers additional resources for children with disabilities. For older teens, there is an advanced search engine, GoogleScholastic.com. Both search engines use Google SafeSearch technology to ensure that children are guided to sites that are appropriate for them.

FactMonster.com

FactMonster offers text, video, and other resources on many topics. A reference desk with access to a dictionary, atlas, and encyclopedia is included. A Homework Center is available with ideas about how to develop homework habits and skills and how to use the available resources. It is available for grade levels K–12 and includes topics covering math, language arts, social studies, and science.

Askkids.com

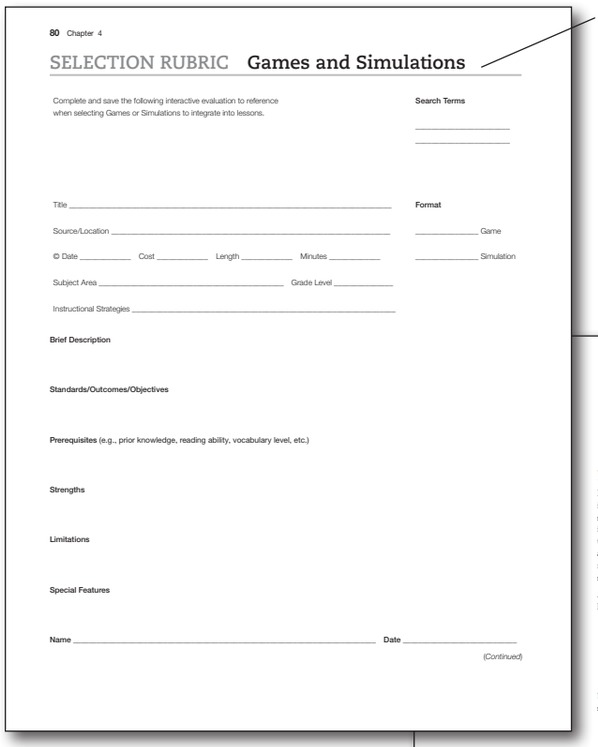
This is a student version of Ask.com that uses age-appropriate content, filtering, and search terms to help kids narrow their searches by asking questions.

Kidsclick.org

Librarians created this site to help students conduct searches. Main topic menus and helpful links make it a kid-friendly search engine.

Technology Resources

Because many schools have tight budgets, this feature offers a list of practical and valuable resources that are free or inexpensive. They also inform the reader how to obtain the resources. These are listed at the ends of chapters along with helpful web links.



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SELECTION RUBRIC **Games and Simulations**

Complete and save the following interactive evaluation to reference when selecting Games or Simulations to integrate into lessons.

Search Terms

Title

Format

Source/Location _____ Game

© Date _____ Cost _____ Length _____ Minutes _____ Simulation

Subject Area _____ Grade Level _____

Instructional Strategies

Brief Description

Standards/Outcomes/Objectives

Prerequisites (e.g., prior knowledge, reading ability, vocabulary level, etc.)

Strengths

Limitations

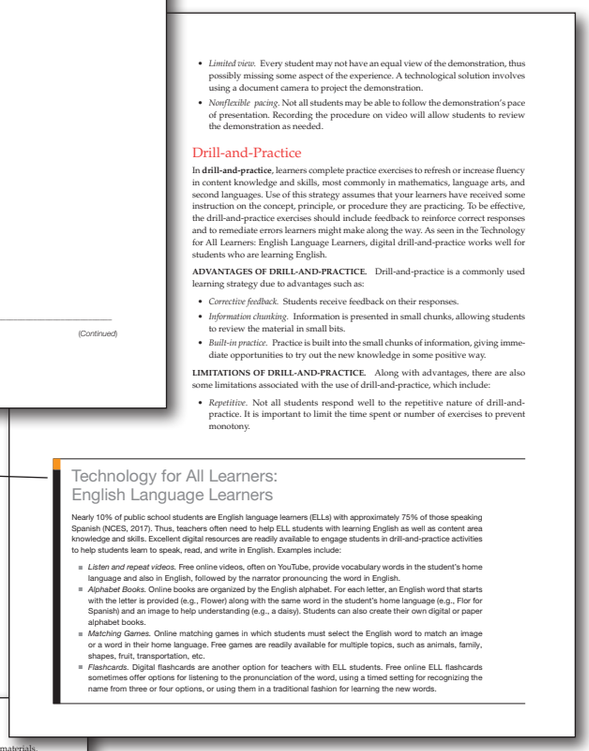
Special Features

Name _____ **Date** _____

(*Continued*)

Selection Rubrics

These rubrics are related to each of the technology and media formats, making it easy to preview materials systematically and to preserve the information for later reference. Textbook users have permission to print these rubrics for personal use.



- *Limited view.* Every student may not have an equal view of the demonstration, thus possibly missing some aspect of the experience. A technological solution involves using a document camera to project the demonstration.
- *Nonflexible pacing.* Not all students may be able to follow the demonstration's pace of presentation. Recording the procedure on video will allow students to review the demonstration as needed.

Drill-and-Practice

In **drill-and-practice**, learners complete practice exercises to refresh or increase fluency in content knowledge and skills, most commonly in mathematics, language arts, and second languages. Use of this strategy assumes that your learners have received some instruction on the concept, principle, or procedure they are practicing. To be effective, the drill-and-practice exercises should include feedback to reinforce correct responses and to remediate errors learners might make along the way. As seen in the Technology for All Learners: English Language Learners, digital drill-and-practice works well for students who are learning English.

ADVANTAGES OF DRILL-AND-PRACTICE. Drill-and-practice is a commonly used learning strategy due to advantages such as:

- *Corrective feedback.* Students receive feedback on their responses.
- *Information chunking.* Information is presented in small chunks, allowing students to review the material in small bits.
- *Built-in practice.* Practice is built into the small chunks of information, giving immediate opportunities to try out the new knowledge in some positive way.

LIMITATIONS OF DRILL-AND-PRACTICE. Along with advantages, there are also some limitations associated with the use of drill-and-practice, which include:

- *Repetitive.* Not all students respond well to the repetitive nature of drill-and-practice. It is important to limit the time spent or number of exercises to prevent monotony.

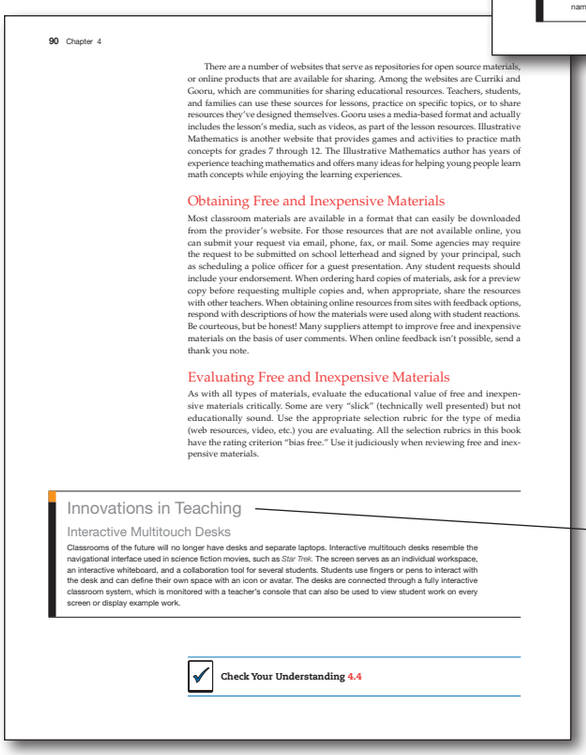
Technology for All Learners:
English Language Learners

Nearly 10% of public school students are English language learners (ELLs) with approximately 75% of those speaking Spanish (NCES, 2017). Thus, teachers often need to help ELL students with learning English as well as content area knowledge and skills. Excellent digital resources are readily available to engage students in drill-and-practice activities to help students learn to speak, read, and write in English. Examples include:

- *Listen and repeat videos.* Free online videos, often on YouTube, provide vocabulary words in the student's home language and also in English, followed by the narrator pronouncing the word in English.
- *Alphabet Books.* Online books are organized by the English alphabet. For each letter, an English word that starts with the letter is provided (e.g., Flower) along with the same word in the student's home language (e.g., Flor for Spanish) and an image to help understanding (e.g., a daisy). Students can also create their own digital or paper alphabet books.
- *Matching Games.* Online matching games in which students must select the English word to match an image or a word in their home language. Free games are readily available for multiple topics, such as animals, family, shapes, fruit, transportation, etc.
- *Flashcards.* Digital flashcards are another option for teachers with ELL students. Free online ELL flashcards sometimes offer options for listening to the pronunciation of the word, using a timed setting for recognizing the name from three or four options, or using them in a traditional fashion for learning the new words.

Technology for All Learners

This feature describes technology and media that can be used to meet the learning needs of diverse learners, ranging from those with learning disabilities to gifted and talented students.



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There are a number of websites that serve as repositories for open source materials, or online products that are available for sharing. Among the websites are Curriki and Gooru, which are communities for sharing educational resources. Teachers, students, and families can use these sources for lessons, practice on specific topics, or to share resources they've designed themselves. Gooru uses a media-based format and actually includes the lesson's media, such as videos, as part of the lesson resources. Illustrative Mathematics is another website that provides games and activities to practice math concepts for grades 7 through 12. The Illustrative Mathematics author has years of experience teaching mathematics and offers many ideas for helping young people learn math concepts while enjoying the learning experiences.

Obtaining Free and Inexpensive Materials

Most classroom materials are available in a format that can easily be downloaded from the provider's website. For those resources that are not available online, you can submit your request via email, phone, fax, or mail. Some agencies may require the request to be submitted on school letterhead and signed by your principal, such as scheduling a police officer for a guest presentation. Any student requests should include your endorsement. When ordering hard copies of materials, ask for a preview copy before requesting multiple copies and, when appropriate, share the resources with other teachers. When obtaining online resources from sites with feedback options, respond with descriptions of how the materials were used along with student reactions. Be courteous, but be honest! Many suppliers attempt to improve free and inexpensive materials on the basis of user comments. When online feedback isn't possible, send a thank you note.

Evaluating Free and Inexpensive Materials

As with all types of materials, evaluate the educational value of free and inexpensive materials critically. Some are very "slick" (technically well presented) but not educationally sound. Use the appropriate selection rubric for the type of media (web resources, video, etc.) you are evaluating. All the selection rubrics in this book have the rating criterion "bias free." Use it judiciously when reviewing free and inexpensive materials.

Innovations in Teaching

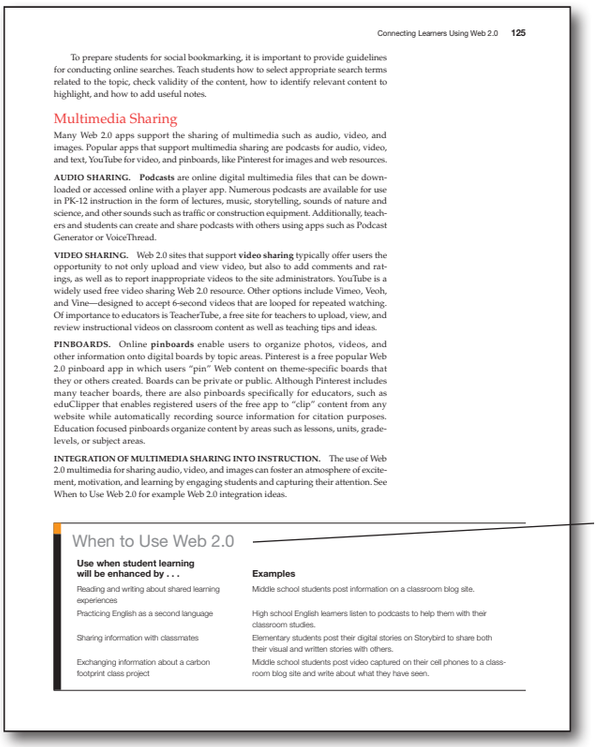
Interactive Multitouch Desks

Classrooms of the future will no longer have desks and separate laptops. Interactive multitouch desks resemble the navigational interface used in science fiction movies, such as *Star Trek*. The screen serves as an individual workspace, an interactive whiteboard, and a collaboration tool for several students. Students use fingers or pens to interact with the desk and can define their own space with an icon or avatar. The desks are connected through a fully interactive classroom system, which is monitored with a teacher's console that can also be used to view student work on every screen or display example work.

Check Your Understanding 4.4

Innovations in Teaching

This feature presents chapter-specific examples of innovative trends and technologies in teaching and learning.



Connecting Learners Using Web 2.0 125

To prepare students for social bookmarking, it is important to provide guidelines for conducting online searches. Teach students how to select appropriate search terms related to the topic, check validity of the content, how to identify relevant content to highlight, and how to add useful notes.

Multimedia Sharing

Many Web 2.0 apps support the sharing of multimedia such as audio, video, and images. Popular apps that support multimedia sharing are podcasts for audio, video, and text, YouTube for video, and pinboards, like Pinterest for images and web resources.

AUDIO SHARING. **Podcasts** are online digital multimedia files that can be downloaded or accessed online with a player app. Numerous podcasts are available for use in PK-12 instruction in the form of lectures, music, storytelling, sounds of nature and science, and other sounds such as traffic or construction equipment. Additionally, teachers and students can create and share podcasts with others using apps such as Podcast Generator or VoiceThread.

VIDEO SHARING. Web 2.0 sites that support **video sharing** typically offer users the opportunity to not only upload and view video, but also to add comments and ratings, as well as to report inappropriate videos to the site administrators. YouTube is a widely used free video sharing Web 2.0 resource. Other options include Vimeo, Veoh, and Vine—designed to accept 6-second videos that are looped for repeated watching. Of importance to educators is TeacherTube, a free site for teachers to upload, view, and review instructional videos on classroom content as well as teaching tips and ideas.

PINBOARDS. Online **pinboards** enable users to organize photos, videos, and other information onto digital boards by topic areas. Pinterest is a free popular Web 2.0 pinboard app in which users "pin" Web content on theme-specific boards that they or others created. Boards can be private or public. Although Pinterest includes many teacher boards, there are also pinboards specifically for educators, such as eduClipper that enables registered users of the free app to "clip" content from any website while automatically recording source information for citation purposes. Education focused pinboards organize content by areas such as lessons, units, grade-levels, or subject areas.

INTEGRATION OF MULTIMEDIA SHARING INTO INSTRUCTION. The use of Web 2.0 multimedia for sharing audio, video, and images can foster an atmosphere of excitement, motivation, and learning by engaging students and capturing their attention. See When to Use Web 2.0 for example Web 2.0 integration ideas.

When to Use Web 2.0

Use when student learning will be enhanced by . . .	Examples
Reading and writing about shared learning experiences	Middle school students post information on a classroom blog site.
Practicing English as a second language	High school English learners listen to podcasts to help them with their classroom studies.
Sharing information with classmates	Elementary students post their digital stories on Storybird to share both their visual and written stories with others.
Exchanging information about a carbon footprint class project	Middle school students post video captured on their cell phones to a classroom blog site and write about what they have seen.

When to Use

This feature gives specific tips on using technology and media with clarity, flair, and dramatic effect. It goes with the U of the ASSURE Model (Utilize Technology, Media, and Materials).

Support Materials for Instructors

The following resources are available for instructors to download on www.pearsonhighered.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.

The Instructor's Guide (0134298284)

The Instructor's Guide provides chapter-by-chapter tools for use in class. Teaching strategies, in-class activities, student projects, key term definitions, and helpful resources will reinforce key concepts or applications and keep students engaged.

PowerPoint® Presentations (0134298276)

Designed as an instructional tool, the presentations can be used to elaborate on chapter material. They are available for both students and instructors and reinforce key concepts and ideas presented throughout the text.

TestGen (0134287479)

Test Gen is a powerful test generator available exclusively from Pearson Education. You install TestGen on your personal computer (Windows or Macintosh) and create your own tests for classroom testing and for other specialized delivery options, such as a local area network or 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
- Angel Test Bank (zip)
- D2L Test Bank (zip)
- Moodle Test Bank
- Sakai Test Bank (zip)

Authors' Services

The authors are eager to assist you in putting together an outstanding course. We offer the following services to instructors who have adopted this book:

- *Online dialog.* The authors are available to "meet" with your students if you are using an online course delivery learning management tool.
- *Telelectures and Videoconferences.* Contact any of the authors in advance to arrange a guest lecture in your class via telephone or video. Some instructors find this a good way to demonstrate the use of this technology for learning about distance learning options. The authors' e-mail addresses are listed in the Instructor's Guide.
- *Workshops.* The authors have conducted workshops across the country. This is a forum for exchange of ideas and networking among instructors of courses on technology and media. They are also available to provide a workshop in your area if you wish to arrange one.
- *Consulting.* The authors are available for consulting and conducting workshops at the local, state, and national level. They are regular presenters and workshop facilitators across the country and around the world.

If you are a student or an instructor using this text and wish to share your comments with us, please email them to Sharon Smaldino (smaldinos@comcast.net), Deborah Lowther (dlowther@memphis.edu), or Clif Mims (clifmims@memphis.edu).

Acknowledgments

Through each of the editions we have been fortunate to have guidance from the people who teach the courses for which this book is designed. In preparing this edition, again we surveyed a sample of adopters and other leaders in the field to elicit their advice about content and emphases. We also asked other well-respected colleagues in the field to critique the text. We thank all those who gave their time and expertise to help make this textbook what it is. In particular we want to acknowledge those talented individuals who reviewed the twelfth edition and suggested improvements: 1) Rob Branch, University of Georgia 2) Jennifer Richey, Texas Woman's University 3) Mary Smith, Texas A&M Texarkana 4) Matthew A. Williams, Ph.D., Kent State University

We offer an extended appreciation to these teachers for sharing their expertise and allowing us to record their technology integration lessons: Tiare Ahu, high school; Lindsay Kaiser and Jena Marshall, fifth grade; Kerry Bird, fourth grade; Vicki Davis, high school; Jimmy Chun, high school; and Scott James, fifth grade.

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And, we are especially grateful for the opportunity to have worked with Jim Russell, one of the original authors of this text's long-time contribution to the field. Jim is a professor emeritus of Educational Technology at Purdue University, where he was a faculty member for 38 years, having received numerous honors for his teaching. During those years, he also engaged in working with classroom teachers to improve their classroom practice and use of technology. Prior to joining the faculty at Purdue, Jim was a high school mathematics and science teacher. As authors, we have heart-felt gratitude for Jim's guidance, patience, and insights that helped us with this book and with our professional endeavors.

Finally, we thank our families for all they do to make this project possible. Their patience and support have been invaluable in helping us finish this project.

Sharon E. Smaldino

Deborah L. Lowther

Clif Mims

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