Transforming Learning with New Technologies

Fourth Edition

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To the students we are learning from and the students they are learning from, the teachers of today and tomorrow.

About the Authors

Robert W. Maloy is a senior lecturer in the Department of Teacher Education and Curriculum Studies in the College of Education at the University of Massachusetts Amherst, where he coordinates the history and political science teacher education programs. He also co-directs the TEAMS Tutoring Project, a community engagement/service learning initiative in which university students provide academic tutoring to culturally and linguistically diverse students in public schools throughout the Connecticut River Valley region of western Massachusetts. His research focuses on technology and educational change, teacher education, democratic teaching, and student learning. He is coauthor of eight other books: *Kids Have All the Write Stuff: Revised and Updated for a Digital Age; Wiki Works: Teaching Web Research and Digital Literacy in History and Humanities Classrooms; We, the Students and Teachers: Teaching Democratically in the History and Social Studies Classroom; Ways of Writing with Young Kids: Teaching Creativity and Conventions Unconventionally; Kids Have All the Write Stuff: Inspiring Your Child to Put Pencil to Paper; The Essential Career Guide to Becoming a Middle and High School Teacher; Schools for an Information Age;* and *Partnerships for Improving Schools.* Robert has received a University of Massachusetts Amherst Distinguished Teaching Award (2010), the University of Massachusetts President's Award for Public Service (2010), a School of Education Outstanding Teacher Award (2004), a University Distinguished Academic Outreach Award (2004), and the Chancellor's Certificate of Appreciation for Outstanding Community Service (1998 and 1993).

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Preface

Welcome to the fourth edition of *Transforming Learning with New Technologies*. We have written this book to demonstrate the limitless ways teachers and students can use desktops, laptops, smartphones, tablets, apps, interactive websites, coding, makerspaces, 3-D modeling and printing, serious learning games, assistive technologies, performance assessments, and many more new and emerging technologies to create highly interactive, inquiry-based teaching and learning experiences in K–12 schools.

Our goal is to help you transform classrooms into technology-infused places of learning where teachers and students are active educational partners, working together to use and understand technology. Focusing on day-to-day realities of elementary and secondary schools, each chapter addresses the needs of future educators. We provide thoughtful perspectives, instructional examples, descriptions of technology tools and apps, and technology-integrated lesson plans from across the curriculum and for all grade levels as starting points for new teachers to use in developing technology-based learning for students.

As technology transforms every aspect of our lives and our society—from science, medicine, and business to family, entertainment, and education—this fourth edition seeks to support future teachers as they re-envision the roles of technology in schools. Our highly technological, knowledge-based society demands that teachers and students possess new knowledge and expanded talents to be successful in careers and life—what the Partnership for 21st Century Skills calls the "3 Rs and the 4 Cs" of our digital age.

The 3 Rs refer to the academic curriculum content that is taught across the grade levels where teachers add problem solving and inquiry learning to the time-honored skills of reading, writing, and number operations in the subject fields of reading/language arts, mathematics, the sciences, world languages, the arts, economics, geography, history, and government/civics. The 4 Cs are the skills and talents of critical thinking, communication, collaboration, and creativity that every teacher and student must have to understand and succeed in the world of today and tomorrow.

Teaching and learning with the 3 Rs and the 4 Cs mean teachers prepare, deliver, and assess lessons differently while students participate by thinking critically and creatively about all learning they do and what technologies they use, transforming themselves from passive consumers of information *from* technology to active creators of knowledge and understanding *with* technology.

Each of us—young and old, novice or experienced technology user—is living through social, economic, and technological revolutions that are remaking every aspect of our lives, including education. Learning about technology is the essential step in using it successfully both as a teacher and as a learner. Digital technologies directed by the creative ideas that you bring to the art and craft of teaching will continue changing K–12 schools throughout your career. You are only just beginning. In that spirit, we invite you to join us in exploring how *new technologies* create *new opportunities* to *transform teaching and learning* in schools.

New to This Edition

This edition has been substantially revised and updated to incorporate the latest developments in educational technology and digital learning. In it, you will find:

- **Chapters aligned to the newest International Society for Technology in Education (ISTE) Standards**—the first five chapters are aligned to the 2017 ISTE Standards for Educators; the final seven chapters are aligned to the 2016 ISTE Standards for Students. The ISTE Standards for Educators and Students (formerly called NETS for Teachers and NETS for Students) describe and illustrate ways for teachers and students to use technology to achieve learning goals and outcomes. Each chapter supports ISTE's broad vision of technology-infused learning by providing examples, models, and strategies for using interactive technologies to create new patterns of teaching and learning at every grade level.
- **Material on the latest highly interactive technologies and strategies for teaching and learning**—tablets and apps, flipped classrooms, computational thinking, learning to code, 3-D printing, microblogging, online learning, virtual schools, open educational resources, digital citizenship, performance assessments, and using technology with culturally and linguistically diverse learners. An emphasis on highly interactive tools and strategies reflects the changing nature of educational technology from singular devices used by individuals to collaborative tools used by groups and communities.
- **Online Application Exercises in each chapter** focus on having readers utilize digital technologies and apply them directly to their development as educators. Readers are invited to explore technology tools in more depth to experience how they might use these tools in their future classrooms.
- **Technology Transformation Plans** at the end of chapters have been renamed and refocused as "Technology Transformation Learning Plans" to emphasize the educational outcomes for students that result from the ways teachers integrate technology into classroom lessons and learning activities.
- **Designing Instruction with Technology—**the focus of Chapter 4 has been re-envisioned and re-organized to more directly address instructional design with technology. The chapter includes material on different

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types of educational websites and apps, as well as a step-by-step presentation of the instructional design process in action using two science lessons—one for elementary age learners, the other for middle and high school students.

- **Teachers as Technology Leaders**—a chapter on teacher leadership has added material on the SAMR Model of Technology Integration, one-to-one computing and BYOD/T programs, and the role of teachers in addressing digital inequalities facing low-income and culturally and linguistically diverse youngsters. There are also strategies for how new teachers can most effectively manage their online presence and digital reputation on social media.
- **Digital Literacies**—Expanded coverage of digital literacy includes new material on open educational resources (OERs) and public domain materials, as well as strategies for teaching students how to do online research, evaluate the quality of web materials, and recognize and reject fake and false news.
- **Problem Solving and Inquiry Learning**—An entirely revised chapter focuses on using coding, robotics, makerspaces, and 3-D printing with students in schools. The chapter features new material on serious educational games and game-based learning along with a new Technology Transformation Learning Plan: *Recreating Pre-Contact Native American Houses with a Makerspace and 3-D Printing*.
- **Technology for Diverse Learners**—A substantially reorganized chapter emphasizes using technology to support learning for culturally and linguistically diverse students as well as youngsters with special educational needs. There is material on culturally responsive teaching, teaching students who are learning English as a new language, creating digitally accessible assignments for students, and using technology to support a writing process fit for young writers.
- **MyLab Education**
  One of the most visible changes in the fourth edition, also one of the most significant, is the expansion of the digital learning and assessment resources embedded in the eText and the inclusion of MyLab Education in the text. MyLab Education is an online homework and assessment program designed to work with the text to engage learners and to improve learning. Within its structured environment, learners see key concepts demonstrated through real classroom video footage, practice what they learn, test their understanding, and receive feedback to guide their learning and to ensure their mastery of key learning outcomes. Designed to bring learners more directly into the world of K–12 classrooms and to help them see the real and powerful impact of educational technology concepts covered in this book, the online resources in MyLab Education with the Enhanced eText include:
  - **Video Examples.** Embedded videos provide illustrations of educational technology principles or concepts in action. These video examples most often show students and teachers working in classrooms. Sometimes they show students or teachers describing their thinking or experiences.
  - **Self-Checks.** In each chapter, self-check quizzes help assess how well learners have mastered the content. The self-checks are made up of self-grading multiple-choice items that not only provide feedback on whether questions are answered correctly or incorrectly, but also provide rationales for both correct and incorrect answers.
  - **Application Exercises.** Every chapter in the fourth edition includes three interactive Application Exercises called "Application Exercises offer hands-on, technology-based opportunities to explore tools and resources that technology-using educators will want to know about and be able to use with K-12 students. Tech Tool exercises are ways to "test-drive" digital tools, experiencing first-hand how they can function instructionally in school settings. Building Your PLN exercises feature digital technologies that future teachers can add to their professional resume of skills and understandings. Growing and Leading with Technology exercises invite readers to develop their own "what would you do" responses to actual classroom scenarios. Application Exercises have thought questions to answer, after which readers can view our author feedback for each question.

1. Becoming a 21st Century Teacher
   - Application Exercise 1.1: Tech Tool: *Transforming Technology Tools for Tablets, Smartphones and Laptops*
   - Application Exercise 1.2: Building Your PLN: *Selecting Professional Pull and Push Resources*
   - Application Exercise 1.3: Growing and Leading with Technology: *Marco's "PLN Building" Activity*
2. Understanding Educational Technology Issues and Trends
   - Application Exercise 2.1: Building Your PLN: *Examining Apps for Safety and Privacy*
   - Application Exercise 2.2: Tech Tool: *Writing a Review of an Educational App*
   - Application Exercise 2.3: Growing and Leading with Technology—*Cherelle's "Using Technology in the Classroom" Activity*
3. Transforming Learning with Unique, Powerful Technologies
   - Application Exercise 3.1: Building Your PLN: *Web Resources and Apps for Critical Thinking and Problem Solving*
   - Application Exercise 3.2: Building Your PLN: *Web Resources and Apps for Digital Literacy Learning*
   - Application Exercise 3.3: Building Your PLN: *Web Resources and Apps for Digital Communication and Collaboration*
   - Application Exercise 3.4: Building Your PLN: *Web Resources and Apps for Creativity*
   - Application Exercise 3.5: Building Your PLN: *Web Resources and Apps for Digital Citizenship*

4. Designing Instruction with Technology
   - Application Exercise 4.1: Tech Tool: *Exploring Educational Websites and Apps*
   - Application Exercise 4.2: Building Your PLN: *Designing a Classroom Learning Activity with Technology*
   - Application Exercise 4.3: Growing and Leading with Technology—*Tony's "Planets in the Solar System" Learning Activity*
5. Applying Technology as Teacher Leaders and Innovators
   - Application Exercise 5.1: Tech Tool: *Using Technology as Mindtools*
   - Application Exercise 5.2: Building Your PLN: *Managing Your Online Presence as A Teacher*
   - Application Exercise 5.3: Growing and Leading with Technology—*Kate's "Becoming a Technology Leader in Her First Teaching Job"*
6. Teaching Information Literacy and Digital Citizenship
   - Application Exercise 6.1: Tech Tool: *Exploring the Interactive Features of an OER e-Textbook*
   - Application Exercise 6.2: Building Your PLN: *The Multiple Dimensions of Digital Citizenship*
   - Application Exercise 6.3: Growing and Leading with Technology—*Erich's "Researching the First Thanksgiving" Learning Activity*
7. Engaging in Virtual Learning with Online Resources
   - Application Exercise 7.1: Tech Tool: *Assembling a Social Bookmarking Collection*
   - Application Exercise 7.2: Building Your PLN: *Curating Multimedia Standards-based Content*
   - Application Exercise 7.3: Growing and Leading with Technology—*Irene and Stacy's "Thinking Globally, Acting Locally" Learning Activity*
8. Solving Problems and Designing Solutions through Coding, Makerspaces and Serious Gaming
   - Application Exercise 8.1: Building Your PLN: *Evaluating Apps for Learning to Code*
   - Application Exercise 8.2: Tech Tool: *Reviewing a Digital Game for Learning*
   - Application Exercise 8.3: Growing and Leading with Technology: *Sharon's "Inventions and Technologies" Learning Activity*
9. Communicating and Collaborating with Social Technologies
   - Application Exercise 9.1: Tech Tool: *Doing Twitter-based Learning Activities with Students*
   - Application Exercise 9.2: Building Your PLN: *Locating Multimodal Resources for a Collaborative Project-Based Wiki or Google Site*
   - Application Exercise 9.3: Growing and Leading with Technology—*Brook's "Who Came Down That Road?" Learning Activity*
10. Expressing Creativity with Multimedia Technologies
    - Application Exercise 10.1: Tech Tool: *Selecting a Podcast Learning Source for Students*
    - Application Exercise 10.2: Building Your PLN: *Creating a Teacher Channel for Video Resources*
    - Application Exercise 10.3: Growing and Leading with Technology—*Drew's "Physics of Projectile Motion" Learning Activity*
11. Differentiating Instruction with Technology
    - Application Exercise 11.1: Building Your PLN: *Differentiating Instruction through Low Tech/Mid Tech/High Tech Accommodations*
    - Application Exercise 11.2: Tech Tool: *Interactive Vocabulary Learning Tools in a Writing Process Fit for Young Writers*
    - Application Exercise 11.3: Growing and Leading with Technology: *Shannon's "This I Believe Essay" Learning Activity*
12. Empowering Learners through Performance Assessments and Reflection
    - Application Exercise 12.1: Building Your PLN: *Developing Student Feedback Survey Questions*
    - Application Exercise 12.2: Tech Tool: *Reviewing an Online Quiz Game*
    - Application Exercise 12.3: Growing and Leading with Technology—*Mayalyn's "Math Review" Learning Activity*

Author-Created Companion Site

To provide ongoing updates and resources for the 4th edition, we have developed a companion Google site, also called transforming learning with new technologies. It replaces transformingtech, our companion wiki for the 3rd edition. At the new site you will find material related to key topics in each chapter. As new research, materials, and resources become available, our plan is to post them on the site so everyone can find up-to-date news and information about technology, schools, and learning. THE SITE IS FREE ONLINE AT https://sites.google.com/view/transformlearningwithtech

Chapter Organization and Updates

Each chapter is organized around specific learning goals designed to provide teachers and students with information to create successful, technology-infused learning environments in K–12 schools and classrooms.

- Chapter 1 introduces the changing context of education in an increasingly multicultural, multilingual society, along with what it means to be a 21st century teacher who uses technology for teaching and learning. There is material updating Bloom's taxonomy with technology, an introduction to the newest ISTE Standards for Educators and Students, and ideas for how to use this book to begin building a PLN (professional learning network) as a new teacher.
- Chapter 2 identifies the latest issues, developments, and trends in the field of educational technology. There is material on using technology to engage students as well as the impacts of digital inequalities on student achievement gaps. Overcoming differences between student-initiated and teacher-chosen technology use is

a key to addressing a persistent digital disconnect that many students feel at school.

- Chapter 3 discusses how technology can generate unique, powerful, and transforming learning (UPT) as defined by the ISTE Standards for Students and 21st Century Student Outcomes. There are technology-based learning activities, web resources and apps for critical thinking and problem solving, digital literacy, communication and collaboration, creativity, and digital citizenship.
- Chapter 4 reviews learning theories and design processes for incorporating technology into lesson planning, classroom teaching, and student assessment, including constructivist and student-centered approaches to the essential elements of instructional design. Two science lessons, one each for elementary school and high school students, provide a step-by-step overview of the instructional design process in action.
- Chapter 5 discusses the dynamics of integrating technology into teaching while creating educational change in schools. There is a focus on using technology to address digital inequalities and student participation gaps in school classrooms, including one-to-one computing, flipped learning, and interactive educational materials. There are also strategies for college students to utilize to become technology-leading educators.
- Chapter 6 examines the multiple dimensions of information literacy and digital citizenship. Beginning with the importance of digital literacy for teachers and students, there is material on identifying fake and false news, using search engines effectively, critically assessing online materials, and utilizing open educational resources (OERs) and public domain materials. There are also strategies for teaching students how to act responsibly as digital citizens.
- Chapter 7 focuses on using online digital content for teaching and learning while also examining the growth and development of blended learning and virtual schools. Technologies and strategies for curating information include an overview of Google's collection of tools for teachers. There is also material on the strengths and drawbacks of online learning and the importance of using exploratory learning websites and apps to engage students in academic learning.
- Chapter 8 shows ways to develop students' inquiry-learning and problem-solving skills using technology. Teaching coding and robotics engages students in problem-based learning. Serious learning games, online simulations, and virtual reality applications offer students open-ended ways to practice problem solving by thinking critically. Makerspaces and 3-D modeling and printing place students in the roles of inventors, creators, and engineers of creative learning experiences.
- Chapter 9 explains how teachers and students can use digital communication technologies to enhance collaboration, share information, and promote new learning. There are strategies for utilizing e-mail, text messaging, Twitter, and online discussions as a teacher. Blogs, wikis, and Google sites are discussed as technologies for engaging students and implementing collaborative project-based learning activities.
- Chapter 10 explores multimedia technologies and their roles in promoting multimodal learning and student creativity. There are strategies for utilizing e-books and e-readers, educational podcasts, and next-generation presentation tools. There are also ideas and tools for incorporating video in the classroom and supporting students as they engage in photo taking, digital storytelling, and movie-making.
- Chapter 11 explains how technology supports differentiated instruction and universal design for learning by emphasizing educational success for all students. There are tools and strategies for engaging culturally and linguistically diverse learners; an overview of assistive technologies that support students with special educational challenges; and tools for teaching writing within a writing process fit for young writers.
- Chapter 12 demonstrates how teachers and students can become active participants in evaluating and assessing their own growth as learners using technology. The role of assessment in K–12 education is explored along with different types of technology-based, student-centered assessments, including student performance rubrics, democratic classrooms, student feedback surveys, and student participation tools. Digital portfolios for students and teachers are also highlighted as ways for individuals to self-assess personal learning.

In-Chapter Features

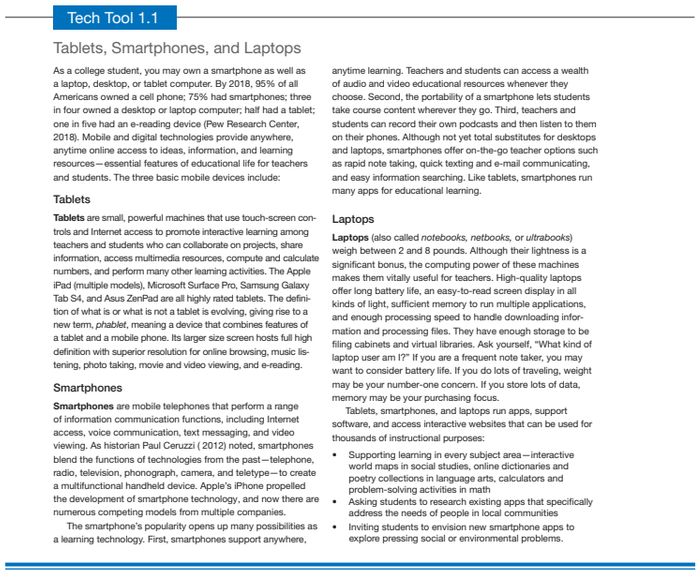
CHAPTER-OPENING PEDAGOGY Each chapter begins with learning outcomes connected to each major heading in the chapter. This establishes the framework for what students should know and be able to do when they complete the chapter. Following the learning outcomes is a graphic organizer outlining the chapter's learning goals; ISTE standards connections; and apps and tools that appear in the chapter. Learning goals offer a guide for students' reading and brief vignettes of real-life situations in schools that introduce the chapter's main theme.

END-OF-CHAPTER ACTIVITIES The following materials provide a thorough review of the chapter and extend student thinking beyond the chapter focus:

- **Chapter Summaries** of the major ideas correspond to the learning outcomes found at the beginning of the chapter.
- **Key Terms** list the important terminology found in the chapter. Terms are found in bold within the chapter text and are defined in the glossary at the end of the book.
- **For Reflection and Discussion** offers end-of-the-chapter questions and exercises for the purpose of individual reflection, group dialogue, and personal writing to reinforce chapter content and its learning goals.

- **Chapter Learning Outcomes** have been consolidated to reflect the evolving emphasis on social media, apps, online digital content, and new interactive tools for teaching and learning. Each learning outcome corresponds to a section within the chapter, arranged from the conceptual to the practical so readers receive an introduction to concepts and learning goals and are then shown ways to implement them in school classrooms.
- **In Practice** is a boxed feature in every chapter that offers classroom-based examples of teachers and students using new technologies for classroom learning. Every In Practice showcases one of the key ideas or technologies being discussed in the chapter by focusing on its practical applications in K–12 schools.

TECH TOOLS Tech Tools in each chapter profile high-quality, easy-to-use, and easy-to-obtain digital tools, apps, and web-based resources that can enhance your work as a teacher, both instructionally and professionally. We describe each tool, how it can be used educationally, and why it is important for teaching and learning. In the eText edition, each Tech Tool includes an interactive, learner-centered Application Exercise designed to help readers of the book explore tools and apps in greater depth. All Tech Tool resources have been class-tested by the authors and students.



Tech Tool 1.1

Tablets, Smartphones, and Laptops

As a college student, you may own a smartphone as well as a laptop, desktop, or tablet computer. By 2018, 95% of all Americans owned a cell phone; 75% had smartphones; three in four owned a desktop or laptop computer; half had a tablet; one in five had an e-reading device (Pew Research Center, 2018). Mobile and digital technologies provide anywhere, anytime online access to ideas, information, and learning resources—essential features of educational life for teachers and students. The three basic mobile devices include:

Tablets

Tablets are small, powerful machines that use touch-screen controls and Internet access to promote interactive learning among teachers and students who can collaborate on projects, share information, access multimedia resources, compute and calculate numbers, and perform many other learning activities. The Apple iPad (multiple models), Microsoft Surface Pro, Samsung Galaxy Tab S4, and Asus ZenPad are all highly rated tablets. The definition of what is or what is not a tablet is evolving, giving rise to a new term, *phablet*, meaning a device that combines features of a tablet and a mobile phone. Its larger size screen hosts full high definition with superior resolution for online browsing, music listening, photo taking, movie and video viewing, and e-reading.

Smartphones

Smartphones are mobile telephones that perform a range of information communication functions, including Internet access, voice communication, text messaging, and video viewing. As historian Paul Ceruzzi (2012) noted, smartphones blend the functions of technologies from the past—telephone, radio, television, phonograph, camera, and teletype—to create a multifunctional handheld device. Apple's iPhone propelled the development of smartphone technology, and now there are numerous competing models from multiple companies.

The smartphone's popularity opens up many possibilities as a learning technology. First, smartphones support anywhere, anytime learning. Teachers and students can access a wealth of audio and video educational resources whenever they choose. Second, the portability of a smartphone lets students take course content wherever they go. Third, teachers and students can record their own podcasts and then listen to them on their phones. Although not yet total substitutes for desktops and laptops, smartphones offer on-the-go teacher options such as rapid note taking, quick texting and e-mail communicating, and easy information searching. Like tablets, smartphones run many apps for educational learning.

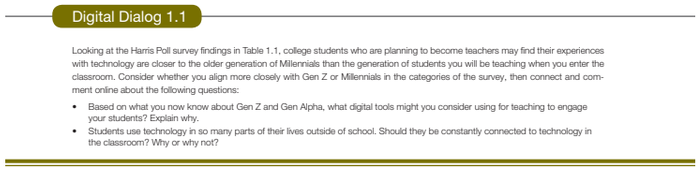
Laptops

Laptops (also called *notebooks, netbooks,* or *ultrabooks*) weigh between 2 and 8 pounds. Although their lightness is a significant bonus, the computing power of these machines makes them vitally useful for teachers. High-quality laptops offer long battery life, an easy-to-read screen display in all kinds of light, sufficient memory to run multiple applications, and enough processing speed to handle downloading information and processing files. They have enough storage to be filing cabinets and virtual libraries. Ask yourself, "What kind of laptop user am I?" If you are a frequent note taker, you may want to consider battery life. If you do lots of traveling, weight may be your number-one concern. If you store lots of data, memory may be your purchasing focus.

Tablets, smartphones, and laptops run apps, support software, and access interactive websites that can be used for thousands of instructional purposes:

- Supporting learning in every subject area—interactive world maps in social studies, online dictionaries and poetry collections in language arts, calculators and problem-solving activities in math
- Asking students to research existing apps that specifically address the needs of people in local communities
- Inviting students to envision new smartphone apps to explore pressing social or environmental problems.

DIGITAL DIALOG A boxed feature in each chapter invites readers to use social media and in-class conversations to explore issues raised throughout the book. Brief questions focus attention on current thinking and future plans. From their own and other students' written reflections, readers learn ways to use new technologies for teaching and learning.

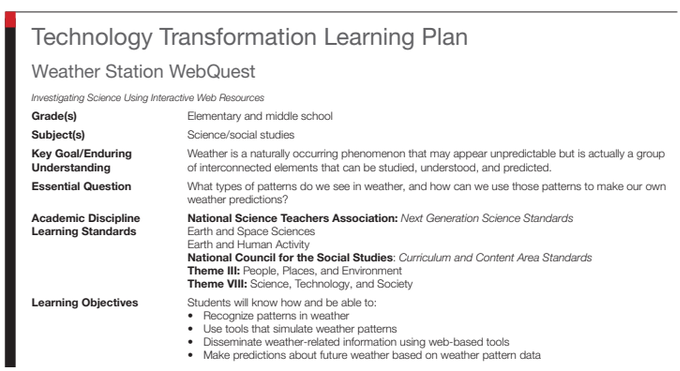


Digital Dialog 1.1

Looking at the Harris Poll survey findings in Table 1.1, college students who are planning to become teachers may find their experiences with technology are closer to the older generation of Millennials than the generation of students you will be teaching when you enter the classroom. Consider whether you align more closely with Gen Z or Millennials in the categories of the survey, then connect and comment online about the following questions:

- Based on what you now know about Gen Z and Gen Alpha, what digital tools might you consider using for teaching to engage your students? Explain why.
- Students use technology in so many parts of their lives outside of school. Should they be constantly connected to technology in the classroom? Why or why not?

TECHNOLOGY TRANSFORMATION LEARNING PLANS Found at the end of Chapters 6–12, Technology Transformation Learning Plans show teachers how to infuse technology in a substantive and meaningful way using a standard lesson plan template with objectives, methods, assessment strategies, national subject area curriculum standards, and the ISTE Standards for Students. Relating directly to the learning goals and new technologies featured in the chapter, each lesson plan offers "before-and-after" insights via a table that includes one column, "Minimal Technology" (the "before" mode), describing how teachers might conduct a lesson without a significant role for technology, and a second column, "Infusion of Technology" (the "after" mode), illustrating how technologies can fundamentally enhance and transform learning for students and teachers. The Technology Transformation Learning Plans are correlated to the ISTE Standards for Students.



Technology Transformation Learning Plan

Weather Station WebQuest

Investigating Science Using Interactive Web Resources

Grade(s)	Elementary and middle school
Subject(s)	Science/social studies
Key Goal/Enduring Understanding	Weather is a naturally occurring phenomenon that may appear unpredictable but is actually a group of interconnected elements that can be studied, understood, and predicted.
Essential Question	What types of patterns do we see in weather, and how can we use those patterns to make our own weather predictions?
Academic Discipline Learning Standards	**National Science Teachers Association:** *Next Generation Science Standards* Earth and Space Sciences Earth and Human Activity **National Council for the Social Studies**: *Curriculum and Content Area Standards* **Theme III:** People, Places, and Environment **Theme VIII:** Science, Technology, and Society
Learning Objectives	Students will know how and be able to: • Recognize patterns in weather • Use tools that simulate weather patterns • Disseminate weather-related information using web-based tools • Make predictions about future weather based on weather pattern data

PROFESSIONAL LEARNING NETWORK (PLN) An expanded inside-the-chapter Application Exercise provides readers with technology exploration activities to complete as they read the book. These hands-on activities are designed to help readers develop a portfolio of knowledge and skills to use when entering the teaching job market and throughout their career. PLNs are a popular concept for new teachers, for as technology educator Torrey Trust (2012, p. 133) noted: "PLNs connect teachers to other individuals worldwide who can offer support, advice, feedback, and collaboration opportunities." PLNs also allow teachers to collect information from various websites so they can stay up-to-date on the latest teaching techniques, pedagogies, and changes in the field of education.

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.

Instructor's Resource Manual and Test Bank

The Instructor's Resource Manual and Test Bank includes suggestions for learning activities, additional Experiencing Firsthand exercises, supplementary lectures, case study analyses, discussion topics, group activities, and a robust collection of test items. Some items (lower-level questions) simply ask students to identify or explain concepts and principles they have learned. But many others (higher-level questions) ask students to apply those same concepts and principles to specific classroom situations—that is, to actual student behaviors and teaching strategies.

PowerPoint Slides

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

TestGen

TestGen is a powerful test generator that instructors install on a computer and use in conjunction with the TestGen testbank file for the text. You install TestGen on your personal computer (Windows or Macintosh) and create your own tests for classroom testing and for other specialized delivery options, such as over a local area network or on the web. A test bank, which is also called a Test Item File (TIF), typically contains a large set of test items, organized by chapter and ready for use in creating a test based on the associated textbook material. Assessments may be created for both print and online testing.

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)

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