16th Edition

Technology in Action

Complete

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Learn Technology by Using *Technology in Action* 16e

The best-selling *Technology in Action* continues to deliver an engaging approach to teaching the topics and skills students need to be digitally literate. Using practical content, hands-on projects, and interactive simulation activities students are engaged in learning.

Today's students are more tech savvy than ever—they know how to use their smartphones, YouTube, Snapchat, and Instagram—and that's how they want to learn. *Technology in Action* is written knowing that many students are digital natives, so the instruction and practice offer students a consistent and engaging experience from chapter to chapter. They don't just read about technology, they engage with it in familiar ways.

For the 16th edition, students will engage with their peers at the beginning of each chapter of the etext by taking a Web-based survey and then analyzing the results with *What Do You Think?* questions. From there students continue to engage with the content by watching videos, working through interactive Helpdesk activities, Sound Byte lessons, IT simulations, and a variety of hands-on projects. Using these resources and the practical content, students learn the concepts and skills they need to be digitally literate in today's workplace. And, if they are using MyLab IT, they can earn the *Digital Competency* badge to demonstrate their skills to potential employers.

Hallmarks

- Engaging **question-and-answer writing style** that approaches topics as students do.
- **Ethics coverage** throughout, including in end-of-chapter activities, Point/Counterpoint ethical debate content found in relevant chapters, and a Sound Byte lesson on how to discuss and debate ethical issues.
- **Hands-on learning** with projects throughout each chapter:
  - **Try This** projects allow students to practice and demonstrate their proficiency with important topics. Each project is accompanied by a how-to video.
  - **Solve This** projects put the concepts students are learning into action through real-world problem solving using Microsoft Office programs. Grader project versions of most of these projects are in MyLab IT.
  - **Make This** projects provide activities where students build programs that run on their mobile devices. Twelve of the chapters have activities that build fully functional mobile apps, compatible with either Android or iOS. Each project includes instructions and a how-to video.
- **Interactive activities** engage students in active learning and *demonstration* of understanding:
  - **Helpdesk** interactive activities provide a review of chapter objectives by having students play the role of a helpdesk staffer assisting customers via a live chat using a decision-based simulation with a quiz.
  - **Sound Byte** audio lessons provide coverage of additional topics related to the chapter, including a brief quiz.
  - **IT Simulations** provide an in-depth chapter scenario that students work through in an active learning environment and complete with a brief quiz to demonstrate understanding. Newly redesigned for a more engaging and easier-to-use learning experience that helps students actively demonstrate understanding. Now includes a "presentation mode" so instructors can walk through the simulation in class or with students.
- **Review and Quizzes**
  - **Check Your Understanding Quizzes** provide a self-check covering objectives in each part of the chapter so that students can see how well they are learning the content.
  - The **Chapter Quiz** provides a way for students to test that they have learned the material from the entire chapter.
  - **New "Chew on This"** critical thinking questions require that students demonstrate their understanding through written answers that are manually graded.
  - **Testbank Exams** provide customizable prebuilt, autograded, objective-based questions covering the chapter objectives.
- **Videos**
  - **Chapter Overview Videos** provide an objective-based review of what students should have learned.
  - **Try This** and **Make This** project videos
- **Helpful Resources**
  - **PowerPoint and Audio Presentations** can be used in class for lecture or assigned to students, particularly online students, for instruction and review.
  - **Instructor Chapter Guides** provide teaching tips; homework and assessment suggestions; a brief overviews of each chapter's *Try This*, *Make This*, and *Solve This* exercises; as well as select Sound Byte talking points and ethics debate starters.

What's New?

- **What Do You Think?** discussion topics begin each chapter with surveys that students complete. They then respond to follow-up questions related to the topic at the end of the chapter to encourage critical thinking.
- **Chew on This** critical thinking questions at the end of each chapter part, encourage students to think critically about the impact of technology on society.
- **Technology in the News** (formerly *TechBytes Weekly*) lets you keep your class current with weekly technology news. This currency widget is included in the etext or Revel versions of *Technology in Action* to provide new and updated content, discussion points, and activities every week.
- **Chapter 8** has been expanded to discuss the challenges students face in managing an active digital lifestyle such as the Dark Web, keeping data private, and using cryptocurrency.
- **Images and quizzes** have been updated throughout.
- A new **Try This project in Chapter 1**—*What Does Facebook Know About You?*—lets students explore the detailed information collected about them by the social media platform.

Summary of Chapter Updates

All chapter Learning Outcomes and Learning Objectives have been revised as needed and throughout the text, figures and photos have been updated with new images, current topics, and state-of-the art technology coverage.

Chapter 1

A new *Try This* exercise leading students through the steps to examine the data stored about them by social media platforms has been added.

The section on technology and careers has been updated with current trends and an emphasis on the impact of artificial intelligence.

Chapter 5

Discussions on additional mobile operating systems like watchOS and tvOS have been added.

Coverage of the latest smarthome devices and open-source solutions has been added.

Chapter 7

The *Bits&Bytes: Net Neutrality* has been updated.

The *Bits&Bytes: Is Dial-Up Still an Option?* has been updated.

The *Bits&Bytes: 5G Is Coming—Is It Worth the Wait?* has been deleted and content has been added to the text.

Ethics in IT: Ethical Challenges of the Internet of Things has moved to Chapter 8.

A new *Bits&Bytes: Power Your Devices Wirelessly* has been added.

Revisions to setting up a Windows home network have been made to remove concept of homegroups.

The *Bits&Bytes: The Rise of Wearable Technology* has moved to Chapter 8.

A new *Ethics in IT: Privacy Challenges of Delivering Free Wi-Fi* has been added.

Chapter 8

Ethics in IT: Ethical Challenges of the Internet of Things has been relocated from Chapter 7.

A new objective, "Discuss the challenges in managing an active digital lifestyle," has been added to the chapter.

A new *Dig Deeper, Deep Web versus Dark Web: Are There Places You Shouldn't Go?*, has been added to the chapter.

Bits&Bytes: The Rise of Wearable Technology has been relocated from Chapter 7.

Chapter 9

A Bits&Bytes addressing the role of social media and computer security in maintaining democratic elections has been added.

Extended treatment of password managers and biometric options for access control has been added.

Chapter 10

New coverage of programming technologies like Swift and JSON.

Chapter 11

The concept of flat databases has replaced discussion of lists.

New content of NoSQL databases has been added.

The content of data staging has been updated.

A new *Bits&Bytes: The Normal Forms* has been added.

Chapter 12

A new *Try This: Sharing Printers on a Network Using Windows* has been added.

Chapter 13

Coverage of web security topics like email encryption and biometrics has been updated.

The most current coverage of cognitive computing has been added.

More student-focused introduction to web frameworks and modern web technologies has been added.

The Program

To maximize student results, we recommend using *Technology in Action* with **MyLab IT**, the teaching and learning platform that empowers you to reach every student. By combining trusted author content with digital tools and a flexible platform, MyLab IT personalizes the learning experience and will help your students learn and retain key course concepts while developing skills that future employers seek.

With MyLab IT for *Technology in Action*, students have access to all of the instruction, practice, review, and assessment resources in one place. There are two ways you can set up your course:

1. You can choose to use the new *sequential learning modules* that allow you to create activities in the order you want students to complete them, providing a consistent, measurable learning experience from chapter to chapter.
2. You can take a second approach for an interactive learning experience, where students use the interactive etext to read and learn actively with Helpdesk activities, Sound Bytes, IT Simulations, *What's New in Technology* currency updates, *What do You Think?* surveys and critical thinking questions, hands-on projects, videos, accessible PowerPoint presentations, and more. You assign the etext chapter, students engage in learning and practice, and go back to their assignments to take the chapter quizzes.

Solving Teaching and Learning Challenges

Technology in Action, 16e provides a hands-on approach to learning computer concepts in which students learn a little and then apply what they are learning in a project or simulation or watch a video to dive deeper. Within the etext, students are engaged through interactive surveys, *What's New in Technology* currency updates, videos, IT Simulations, interactives, fun study tools, and quiz questions with immediate feedback. And with the new *What do you think?* surveys at the beginning of each chapter, the follow-up question at the end of the chapter related to the survey results, as well as new *Chew on This* critical thinking questions at the end of each chapter part, students are encouraged to think critically about the impact of technology on society.

The optimal way to experience *Technology in Action* is with MyLab IT. All of the instruction, practice, review, and assessment resources are in one place, allowing you to arrange your course from an instructional perspective that gives students a consistent, measurable learning experience from chapter to chapter.

Developing Employability Skills

Digital literacy is a top skill required in today's job market! Developing these skills involves conceptual as well as hands-on learning. With *Technology in Action*, students get both—they learn the fundamentals of computers and have opportunities to apply what they are learning in real-world projects and simulations. Using MyLab IT and *Technology in Action*, students can learn, practice, and demonstrate their digital literacy.

- **High-Demand Office Skills** are evaluated in the auto-graded *Solve This* projects in each chapter.
- **Essential Digital Literacy Skills** are taught and practiced throughout the book *in Try This*, *Solve This*, and *Make This* projects.

Employability Skills Matrix (ESM)								
	Ethics Projects	Try This Projects	Solve This Projects	Make This Projects	What do you think?	Interactives: Helpdesks, Sound Bytes, IT Sims	Team Time Projects	Badge
Critical Thinking	x		x	x	x		X	
Communication	x				x	x	X	
Collaboration	x				x	x	X	
Knowledge Application and Analysis	x	X	x	x	x	x	X	
Social Responsibility	x	X			x			

Applied Learning Opportunities Throughout

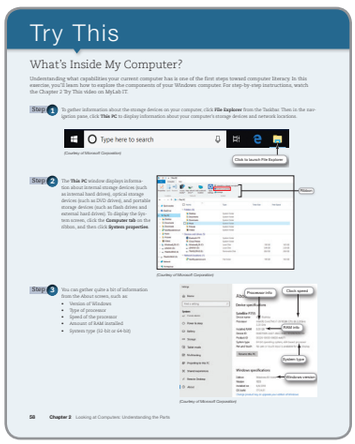
Using MyLab IT with *Technology in Action* provides students with a variety of ways to get instruction, practice, review, and assessment.

Technology in the News

Formerly *TechBytes Weekly*, these weekly currency updates deliver the latest technology news stories to you to use in your classroom. The update is live in the etext chapter, so no matter where you are in the content, you'll have this weekly update to use for in-class discussion or as a reading assignment.

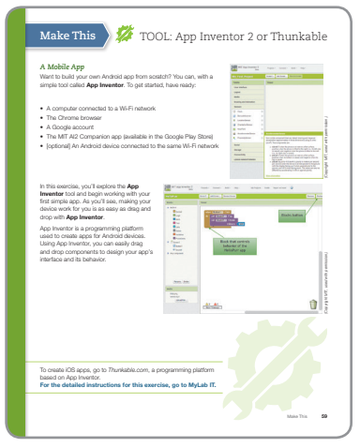
Try This Projects

These projects have students apply what they are learning in a practical project that uses skills they'll need in the workforce and everyday life. Each project includes a video to guide students through the project.



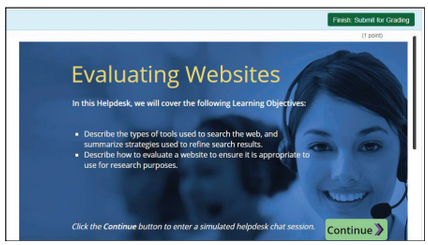
Make This Projects

These hands-on activities lead students to explore mobile app development in either an Android or iOS environment.



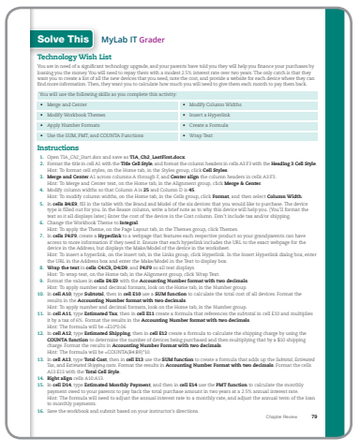
Helpdesk Activities

The Helpdesk training content, created specifically for *Technology in Action*, enables students to take on the role of a helpdesk staffer fielding questions posed by computer users so that students demonstrate their understanding in an active learning environment. Each Helpdesk ends with a quiz, ensuring students have grasped the content.



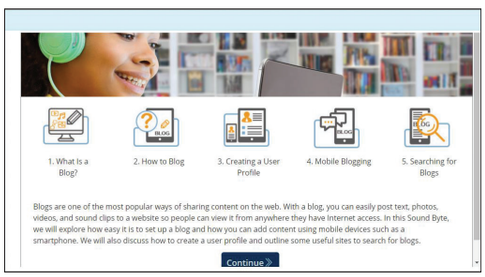
Solve This Projects

These exercises integrate and reinforce chapter concepts with Microsoft Office skills.



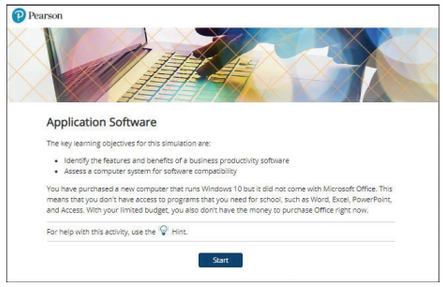
Sound Bytes

Sound Bytes expand student mastery of complex topics through engaging lessons with a brief quiz to check understanding.



IT Simulations

These detailed interactive scenarios cover a core chapter topic in a hands-on environment where students can apply what they have learned and demonstrate understanding through active engagement.



Instructor Teaching Resources

This program comes with the following teaching resources.

Supplements available to instructors at www.pearsonhighered.com/techinaction	Features of the Supplement
Accessible PowerPoint Presentation	PowerPoints meet accessibility standards for students with disabilities. Features include, but are not limited to: • Keyboard and Screen Reader Access • Alternative Text for Images • High Color Contrast between Background and Foreground Colors
End-of-Chapter Answer Key, Check Your Understanding Answer Key, Chapter Quiz Answer Key	Answers to all end-of-chapter questions.
Image Library	Every image in the book.
Instructor Chapter Guide	• Content Instruction • Student Preparation and Review • Active Learning Options • Chapter Assessment • End-of-Chapter Exercises • Currency Topics • Soft Skills and Team Work • Instructor Resources
Make This Projects	Activities where students build programs that run on their mobile devices. Each project includes instructions and a how-to video.
Objectives Mapping	Outline of the objectives in every chapter.
Solve This Projects	Real-world problem solving using Microsoft Office programs. Grader versions of most of these projects are in MyLab IT.
Syllabus Template	Sample syllabus for help in setting up your course.
Test Bank (Textbook, Helpdesk, Sound Bytes)	Over 1,000 multiple-choice, true/false, short-answer, and matching questions with these annotations: • Difficulty level (1 for straight recall, 2 for some analysis, 3 for complex analysis) • Objective, which provides location in the text Provided for: • Textbook • Helpdesk • Sound Byte
Computerized TestGen	TestGen allows instructors to: • Customize, save, and generate classroom tests • Edit, add, or delete questions from the Test Item files • Analyze test results • Organize a database of tests and student results
Transition Guide	Detailed explanation of changes between the previous and current edition.
Web Projects	Discussion questions and additional projects that can be done on the Internet.

Letter from the Authors

Our 16th Edition—A Letter from the Authors

Why We Wrote This Book

The pace of technological change is ever increasing. In education, we have seen this impact us more than ever recently—the Maker movement, the Internet of Things, MOOCs, touch-screen mobile delivery, and Hangouts are now fixed parts of our environment.

Even the most agile of learners and educators need support in keeping up with this pace of change. Our students have easier access to more information than any generation before them. We recognize the need for them to be able to think critically and investigate the data they see. In this edition, we introduce the use of chapter-opening features called *What do you think?* that allow students to critically think about a chapter topic. Students then follow up at the end of the chapter by answering additional related critical thinking questions in a *What do you think now?* feature.

We have also responded by integrating material to help students develop skills for web application and mobile programming. We see the incredible value of these skills and their popularity with students and have included *Make This* exercises for each chapter. These exercises gently bring the concepts behind mobile app development to life. In addition, there is a *Solve This* exercise in each chapter that reinforces chapter content while also applying Microsoft Office skills. These projects help to promote students' critical-thinking and problem-solving skills, which employers value highly.

The Helpdesk and Sound Byte training modules and IT Simulations continue to provide students with an active learning environment in which they can reinforce their learning of chapter objectives. In this edition, we have put the spotlight on critical thinking. We've integrated real-time surveys on important technology topics to foster classroom discussion and analytical skills. We have also included additional material on key challenges of a digital lifestyle, such as using digital currency, avoiding the Dark Web, and protecting privacy.

We also continue to emphasize the many aspects of ethics in technology debates. Some of the Helpdesks and IT Simulations support instruction on how to conduct thoughtful and respectful discussion on complex ethical issues.

Our combined 70 years of teaching computer concepts have coincided with sweeping innovations in computing technology that have affected every facet of society. From iPads to Web 2.0, computers are more than ever a fixture of our daily lives—and the lives of our students. But although today's students have a much greater comfort level with their digital environment than previous generations, their knowledge of the machines they use every day is still limited**.**

Part of the student-centered focus of our book has to do with making the material truly engaging to students. From the beginning, we have written *Technology in Action* to focus on what matters most to today's student. Instead of a history lesson on the microchip, we focus on tasks students can accomplish with their computing devices and skills they can apply immediately in the workplace, in the classroom, and at home.

We strive to keep the text as current as publishing timelines allow, and we are constantly looking for the next technology trend or gadget. We have augmented the etext with weekly *What's New in Technology* automatic updates. These updates will be in each chapter, so regardless of where you are in the text, you'll have current topics to talk about in class related to the latest breaking developments.

We also continue to include a number of multimedia components to enrich the classroom and student learning experience. The result is a learning system that sparks student interest by focusing on the material they want to learn (such as how to integrate devices into a home network) while teaching the material they need to learn (such as how networks work). The sequence of topics is carefully set up to mirror the typical student learning experience.

As they read this text, your students will progress through stages and learning outcomes of increasing difficulty:

- Thinking about how technology offers them the power to change their society and their world and examining why it's important to be computer fluent
- Understanding the basic components of computing devices
- Connecting to and exploring the Internet
- Exploring application software
- Learning about the operating system and personalizing their computer
- Evaluating and upgrading computing devices
- Understanding home networking options
- Creating digital assets and understanding how to legally distribute them
- Keeping computing devices safe from hackers
- Going behind the scenes, looking at technology in greater detail

We strive to structure the book in a way that makes navigation easy and reinforces key concepts. We continue to design the text around learning outcomes and objectives, making them a prominent part of the chapter structure. Students will see the learning outcomes and objectives in the chapter opener, throughout the text itself, as well as in the summary so they understand just what they are expected to learn.

We also continue to structure the book in a progressive manner, intentionally introducing on a basic level in the earlier chapters concepts that students traditionally have trouble with and then later expanding on those concepts in more detail when students have become more comfortable with them. Thus, the focus of the early chapters is on practical uses for the computer, with real-world examples to help the students place computing in a familiar context. For example, we introduce basic hardware components in Chapter 2, and then we go into increasingly greater detail on some hardware components in Chapter 6. The Behind the Scenes chapters venture deeper into the realm of computing through in-depth explanations of how programming, networks, the Internet, and databases work. They are specifically designed to keep more experienced students engaged and to challenge them with interesting research assignments.

In addition to extensive review, practice, and assessment content, each chapter contains several problem-solving, hands-on activities that can be carried out in the classroom or as homework:

- The *Try This* exercises lead students to explore a particular computing feature related to the chapter.
- The *Make This* exercises are hands-on activities that lead students to explore mobile app development in both the Android and iOS environments.
- The *Solve This* exercises integrate and reinforce chapter concepts with Microsoft Office skills.

Throughout the years we have also developed a comprehensive multimedia program to reinforce the material taught in the text and to support both classroom lectures and distance learning:

- New chapter-opening features called *What do you think?* allow students to critically think about a chapter topic. Students then follow up at the end of the chapter by answering additional related critical thinking questions in a *What do you think now?* feature.
- New *Chew on This* critical-thinking questions require that students demonstrate their understanding through written answers that are manually graded.
- The Helpdesk training content, created specifically for *Technology in Action*, enables students to take on the role of a helpdesk staffer fielding questions posed by computer users so that students can demonstrate their understanding in an active learning environment.
- Sound Bytes expand student mastery of complex topics through engaging lessons with a brief quiz to check understanding.
- IT Simulations are detailed, interactive scenarios covering the core chapter topic. As students work through the simulation, they apply what they have learned and demonstrate understanding in an active learning environment.
- The *What's New in Technology* (formerly *TechBytes Weekly*) is a weekly currency update that delivers the latest technology news stories to you for use in your classroom. In addition, the currency items have discussion points or activities included. The update is live in the etext chapters, so no matter where you are in the content, you'll have this weekly update to use for an in-class discussion or reading assignment.

About the Authors

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Alan is currently a faculty member at Moore College of Art and Design and Montgomery County Community College, teaching a variety of computer science and business courses. He holds a BS in accounting from Rider University and an MS in Information Systems from Drexel University, and he is a certified public accountant. After a successful career in business, Alan finally realized that his true calling is education. He has been teaching at the college level since 2000. He enjoys attending technical conferences and exploring new methods of engaging students.

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Kendall is a full professor of Computer Science at Montgomery County Community College with teaching experience at both the undergraduate and graduate levels at a number of institutions, including Villanova University, DeSales University, Ursinus College, and Arcadia University. Her education includes a BS in electrical engineering from the University of Rochester and an MS and a PhD in engineering from the University of Pennsylvania. Kendall has industrial experience in research and development environments (AT&T Bell Laboratories) as well as experience with several start-up technology firms.

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Mary Anne is a senior faculty member at Montgomery County Community College, teaching various computer application and concepts courses in face-to-face and online environments. She enjoys speaking at various professional conferences about innovative classroom strategies. Mary Anne holds a BA in psychology and education from Mount Holyoke College and an MBA in finance from Northwestern University's Kellogg Graduate School of Management. She has been in teaching since 1997, ranging from elementary and secondary education to Montgomery County Community College, Gwynedd-Mercy College, Muhlenberg College, and Bucks County Community College, as well as training in the professional environment. Before teaching, Mary Anne was a vice president at Shearson Lehman Hutton in the Municipal Bond Investment Banking Department.

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—Alan Evans

For all the teachers, mentors, and gurus who have popped in and out of my life.

—Kendall Martin

For my husband, Ted, who unselfishly continues to take on more than his fair share to support me throughout this process, and for my children, Laura, Carolyn, and Teddy, whose encouragement and love have been inspiring.

—Mary Anne Poatsy

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