

TRANSFORMING LEARNING: INTEGRATING TECHNOLOGY AND MEDIA IN EDUCATION



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Transforming Learning: Integrating Technology and Media in Education

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This text was compiled on 04/23/2026

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About the Book



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Dr. Nasreen Rahim and Renee Albrecht, MAED collaborated to source and write content for this textbook.

Preface

Introduction

Welcome to this practical guide designed to support educators and aspiring educators in enhancing their teaching with technology. Whether you're just starting out or have years of experience, this text offers valuable insights, tools, and strategies to help you engage learners and effectively use technology in today's classrooms.

Audience

This textbook is designed for educators, aspiring educators, and others looking to enhance their teaching with technology. It targets introductory to intermediate skill levels, suitable for both new and experienced teachers. The text emphasizes the integration of digital tools & pedagogical strategies designed to engage learners. The text includes trends, best practices, and ethical considerations offering a comprehensive guide for effective technology use in modern education.

Chapter Outline

This textbook is organized into eight chapters, each focusing on a specific competency supporting the successful integration and use of educational technology in teaching and learning:

- **Chapter 1: Integrating Educational Technology (Theory and Practice):** This chapter explores computer technology and digital media's importance and offers strategies to adapt to the digital generation's unique characteristics. By applying pedagogical practices, you'll create engaging tech-enhanced learning experiences, shaping the future of education in the digital age.
- **Chapter 2: Communication Tools in Education:** This chapter explores educational communication tools, including apps, software, and platforms, revolutionize learning by facilitating collaboration, information sharing, and engagement in educational institutions. These digital tools not only save time for teachers on tasks like scheduling but also provide students with innovative ways to work together remotely, transforming classes into interactive communities and offering flexible learning opportunities.
- **Chapter 3: Software and Apps for Education:** In this chapter, educators and learners will learn how to leverage rapidly advancing software and apps in their teaching and learning practices. The focus is on finding digital tools that align with curriculum needs and understanding their pedagogical value. The chapter also delves into evaluating the effectiveness of these tools and explores graphic authoring and editing software to enhance lessons with visuals, ultimately empowering educators to make informed choices.
- **Chapter 4: Hardware and Devices in Education:** This chapter introduces the hardware and devices that we use in education. When it comes to hardware for educators, it's essential to consider devices that facilitate effective teaching and enhance the learning experience. It's crucial for educators and institutions to assess their specific needs, budget constraints, and technological requirements when selecting hardware for educational purposes.
- **Chapter 5: Technology, Media and Curriculum Integration:** This chapter introduces foundational concepts in educational technology, covering technology selection challenges and a brief history of the field. It distinguishes between media and technology, discusses broadcast vs. communicative media, and explores time and space dimensions of media.
- **Chapter 6: Trends and Best Practices in Educational Technology:** This chapter addresses the trends shaping virtual environments and explores how online technologies are transforming the landscape of education. The chapter also addresses some instructional strategies designed for differentiated online learning experiences, helping to adapt content, instruction, and assessment to meet diverse learner needs.
- **Chapter 7: Evaluating Educational Technology:** In this chapter, you'll learn about evaluating educational technology and digital media, integrating them into teaching, and securing funding. It emphasizes the importance of determining the technology's impact on learning, considering user-friendliness, and planning for curriculum integration and funding sustainability.
- **Chapter 8: Security Issues and Ethics in Educational Technology:** This chapter addresses the rise of technology in schools and the associated risks of computer security issues and ethics, explaining their impact and prevention strategies. It equips

educators, administrators, and students with essential knowledge for safeguarding their digital environments and using technology responsibly in educational settings.

For the Students

Each chapter in this text starts with clearly outlined learning objectives and concludes with a summary, followed by knowledge checks that emphasize key topics. For the most effective learning experience, begin by reviewing the learning objectives, read the content and take notes as needed. At the end of the chapter, complete the knowledge checks and compare your answers to the key. Consider reviewing material for the questions that you may not have answered correctly.

For the Instructors

Learning objectives can be found at the beginning of each chapter. All chapters are recommended for use in an educational technology or related course. However, for courses using additional textbooks, a review of the learning objectives may help determine which chapters can be omitted. Additionally, chapters contain current links and videos that align with the chapter content as well. As this topic is ever-changing with the fast moving technology world, the author's intent is to periodically review the content and links to ensure the most recent and relevant information is provided.

It is recommended that the chapters be read in order, however each chapter can stand on its own. The course was written in a competency-based manner, thus each chapter is focused on a single overarching competency, supported by identified chapter and sub-chapter learning objectives. At the end of each chapter, there are knowledge checks with answer keys provided to the reader. These are meant as self-check activities where the reader can check their understanding of the chapter content.

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CHAPTER OVERVIEW

1: Integrating Educational Technology (Theory and Practice)

Chapter Learning Outcome

- Integrate technology to create pedagogical change in teaching and learning

Introduction

In our technology-driven world, educators cannot ignore the power of technology and digital media. To ensure that we are meeting the needs of our technology-driven students, we must integrate technology effectively to create meaningful pedagogical change in teaching and learning. In this chapter, we'll delve into the importance of computer technology and digital media for contemporary students, and introduce strategies and frameworks to guide your understanding and application. You will also identify unique characteristics of the digital generation and their learning needs. By exploring sound pedagogical practices in educational applications and software, you will gain insight into creating engaging, technology-enriched learning experiences. This foundation will equip you to integrate educational technology strategies and frameworks that transform classroom environments. Welcome to the future of teaching and learning in the digital age!



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1.1: The Evolving Landscape of Education

1.2: The Role of Pedagogy in Technology Integration

1.2.1: Pedagogy and Technology Integration

1.3: Digital Learner Characteristics and Their Implications

1.3.1: Teaching to Digital Learners

1.4: Chapter Summary and Knowledge Check

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1.1: The Evolving Landscape of Education

Section Learning Objective

- Explain why computer technology and digital media are essential for education.
 - Begin exploring the impact of technology on education
 - Discuss the need for integrating educational technology in modern classrooms
 - Discuss key benefits and challenges of technology integration in teaching and learning.

This section provides an overview of technology's profound impact on education. We discuss the pressing need to integrate educational technology in modern classrooms. You will learn about key benefits of technology integration, including enhanced engagement, personalized learning, access to global resources, and additional facilitation modalities. We also explore common challenges like equity, safety and security, training needs, and potential over-reliance on technology. With a balanced understanding of the critical role educational technology plays in teaching and learning, you will be equipped to integrate it effectively in the evolving landscape of digitally-driven education.

Technology has completely changed education in the 21st century. The wide availability of affordable personal gadgets, fast internet, and easy-to-use software has disrupted traditional classroom teaching. Teachers now use digital tools like online learning platforms, e-textbooks, instructional videos, simulations, and online tests. Communication and teamwork no longer require being in the same place, with apps for video calls and shared documents enabling smooth interaction. Real-time data analysis gives insights to personalize teaching and interventions. Augmented and virtual reality offer immersive experiences that improve understanding of concepts. Coding teaches computational thinking, while 3D printing encourages creativity and design thinking. However, thoughtless use of every new gadget often leads to superficial use and wasted resources. So, the key is carefully integrating technology combined with sound teaching methods and clear learning goals. When used strategically, technology increases access to high-quality education, engages students through multimedia content, and prepares learners with skills for the future. The transformative power of technology makes it an indispensable part of modern learning.

Today's students are digital natives. They use technology daily for information, communication, and entertainment. So schools must also use technology to teach in effective ways. Digital devices, tools, and media allow lessons to become interactive and engaging. Students can learn at their own pace with personalized content. Technology makes abstract concepts clearer through videos, simulations and visuals. It expands access to high-quality learning resources. Integrating tech in the classroom prepares students with skills needed for the future world and workplace. So modern schools have to embrace educational technology thoughtfully to help students thrive.

As we move through this textbook, we will explore the following benefits and challenges more deeply.

Key Benefits and Challenges of Integrating Technology into Education

Benefits	Challenges
• Enhanced Engagement: Technology can make learning more interactive and engaging, potentially improving student interest and retention. • Personalized Learning: Technology can facilitate differentiated instruction, helping to meet individual student needs and pacing. • Access to Global Resources: The internet opens up a world of resources for both teachers and students, enhancing the breadth and depth of education. • Development of Digital Literacy: Regular use of technology in learning can help students develop digital skills, essential for the modern workplace. • Facilitation of Remote Learning: Technology allows for remote learning opportunities, making education more accessible.	• Equity in Access: Not all students have equal access to technology, which can create disparities in the learning experience. • Technical Issues and Support: Technical glitches can disrupt learning. Adequate tech support is required, which can strain resources. • Online Safety and Security: Teaching and learning online can raise issues around data privacy, cyberbullying, and inappropriate content. • Over-reliance on Technology: There's a risk of over-reliance on technology, potentially at the expense of critical thinking, problem-solving, and interpersonal skills. • Training and Adaptation: Teachers and students may need significant training and adaptation time to use new technologies effectively.

Articles and Resources

The following online article provides deeper context to why computer technology and digital media are essential for education.

[Understanding the role of digital technologies in education: A review](https://www.sciencedirect.com/scienc...66412722000137). Abid Haleem, Mohd Javaid, Mohd Asim Qadri, Rajiv Suman, Sustainable Operations and Computers, Volume 3, 2022, Pages 275-285, ISSN 2666-4127, <https://doi.org/10.1016/j.susoc.2022.05.004>. (https://www.sciencedirect.com/scienc...66412722000137). License CC-BY 4.0. [30 minute read]

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1.2: The Role of Pedagogy in Technology Integration

Section Learning Objectives

- Identify sound pedagogy in educational applications and software.

This section will explore the relationship between teaching strategies and educational technologies – a key perspective in modern education. Pedagogy, the art and science of teaching and technology integration are now deeply intertwined in teaching and learning strategies. We must remember, however, that **effective technology integration is rooted in sound pedagogy**, not just devices and software.

The relationship between pedagogy and educational technology

Understanding the relationship between pedagogy and educational technology is essential. In your curriculum, content is the **what**. Pedagogy involves grasping **how** learning occurs and designing teaching to facilitate this effectively. When technology enters the picture, it becomes a tool that can **support and enhance** our pedagogical practices. This might be through collaborative platforms like Microsoft Teams, feedback tools such as Quizlet, or multimedia resources like YouTube or Khan Academy. Effective technology integration is an ongoing cycle: **Research and Plan, Implement, Gather Data and Feedback, and Evaluate**. Repeat as needed.



Figure 1.2.1: Cycle of effective technology integration by Renee Albrecht. Licensed under [CC BY](#).

Effective integration and use also includes aligning these digital tools with curriculum standards and learning goals, and continually evaluating and adapting their usage based on pedagogical principles. Some examples of evaluation might include: collecting student feedback through surveys or discussions, observing changes in engagement levels, or analyzing data provided by the educational technology itself.

It's also worth noting that while educational technology can offer significant advantages, it can also present challenges. Some of those challenges might be: ensuring equitable access for all students, addressing potential distractions, and ensuring that instructors and teachers are adequately trained on the technology, among others. Despite these challenges, the overlap of technology and pedagogy provides a great deal of potential for improved teaching and learning. An important note, however, technology must serve to facilitate and enhance high-quality teaching fundamentals, not replace them. As stated above: successful technology integration includes a sound **understanding and application of effective pedagogy**.

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1.2.1: Pedagogy and Technology Integration

Pedagogical considerations for effective technology integration

When integrating technology into education, educators must carefully consider how its use aligns with core pedagogical goals and practices. One key consideration is ensuring **active learning**. Active learning involves students actively engaging in the learning process rather than passively receiving information. Effective technology tools allow students to **engage interactively with content**, **receive ongoing feedback**, and **participate in knowledge construction**. For example, interactive simulations such as PhET Interactive Simulations, formative assessment platforms like Kahoot!, interactive platforms like Thinklink, and digital collaboration tools like Google Docs can promote active learning. Active learning is not technology that primarily facilitates passive consumption of information, such as certain video lectures or read-only resources.



Figure 1.2.2: Characteristics of Effective Technology Tools by Renee Albrecht. Licensed under CC BY.

Another vital consideration is maintaining human connection and interaction. While technology can enable personalized learning and individual development, it should not isolate students. Technologies like Zoom for video conferencing and Google Docs, Google Calendar, or DropBox for managing collaborative projects allow relationship building and community in a digital environment when used effectively. A blended learning model, which combines the strengths of in-person and digital interactions, offers one effective approach. Effective educators keep in mind the challenges that may arise, such as ensuring equitable access to technology or managing potential distractions. Teachers should be prepared with strategies to address these.

In addition to the selection of appropriate tools, the role of the teacher is crucial in effective technology integration. Teachers provide guidance and feedback to help students use technology responsibly and effectively. It is important that educators receive sufficient training and ongoing support to feel comfortable and capable with the selected technology. Finally, considering student needs, experiences, challenges, potential barriers, and feedback in technology selection and use is essential. Listening to students can offer invaluable insights about what works and what doesn't in a real-world classroom setting.

The core pedagogical principles of active engagement, knowledge construction, community building, and human interaction should drive the research, planning, and implementation decisions of technology.

Aligning technology with learning outcomes

When used strategically, technology can facilitate achieving learning objectives and outcomes. However, the key is not having the most advanced tools, but **aligning them with educational goals**. Learning objectives guide the selection of instructional strategies and activities. When integrating technology, these objectives should direct the tools chosen. For example, if an objective is developing collaborative skills, a tool like Padlet or Google docs might be used for team brainstorming. If the goal is increasing student engagement with content, a tool like Quizlet or Kahoot! might be selected.

Technology use should also align with desired learning outcomes - what students should know and be able to do by the end of a lesson. If an outcome is analyzing data, perhaps having students manipulate datasets in Excel could provide hands-on experience. If building digital literacy, teaching video editing or coding tools could be beneficial. **It's essential to evaluate learners' needs and goals first, then select technology.** While technology can provide innovative ways to meet objectives, it does not replace quality curriculum, instruction, and teaching practices. With strategic implementation, technology becomes an asset to enrich learning and help students achieve.

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1.3: Digital Learner Characteristics and Their Implications

Section Learning Objectives

- Identify characteristics and preferences of today's digital-native students.
- Explore strategies for leveraging technology to engage and motivate digital learners.

Digital Learners and Their Tech-Savvies

Today's students, often referred to as "digital learners," have grown up surrounded by technology. They often intuitively understand the intricacies of devices, software, and digital platforms, and they expect the digital realm to be part of their learning journey. Unlike previous generations, where technology might have been a supplementary part of life, for digital learners, it is often integral. For example, you might see a toddler today might naturally attempt to swipe or tap on a TV screen, expecting it to respond like a touchscreen tablet or smartphone.

Keep in mind that there is, however, a significant amount of theory focused on the digital learner, but this effort is just beginning and fortunately seems to be "still growing." As educators, we need to stay abreast of current research as we move forward with innovative and learner-focused programs.

Digital learners are known for their intuitive tech fluency, multitasking abilities, digital communication preference, visual and kinesthetic learning inclination, expectation for immediate feedback, self-directed learning, adaptability to digital evolution, digital content creation, preference for gamification, and continuous connectivity. Overall, recognizing these characteristics is important for educators, parents, and technology designers to ensure that the evolving digital landscape aligns with the inherent tendencies and needs of this generation (NCES, n.d)

Digital Learner Characteristics, (NCES, n.d)

Characteristic	Description	Example
Intuitive Tech Fluency	An innate understanding and comfort with digital technology, often grasping new tools without formal instruction.	When introduced to a new educational app in class, a digital learner immediately starts exploring its functionalities without needing a step-by-step tutorial.
Multitasking Abilities	Comfortably juggling multiple digital tasks or platforms simultaneously.	A digital learner might be working on an assignment on their laptop while listening to music and intermittently checking and responding to messages on their smartphone.
Digital Communication Preference	Leans toward digital platforms for interaction and communication.	Instead of discussing a project face-to-face, a group of digital learners might choose to collaborate and brainstorm using a tool like Google Docs or a group chat on platforms like Microsoft Teams or Google Chat.
Visual and Kinesthetic Learning Preferences	A preference for learning through visual mediums and interactive experiences over traditional textual formats.	A student might prefer learning history through an interactive timeline app rather than reading plain text in a textbook.
Looking for Immediate Feedback	Accustomed to instant responses and anticipate quick or instant feedback.	After playing an educational game, they expect immediate scores and progress information.
Self-Directed Learning	Independently seeks out information or tutorials online.	If curious about a topic not covered in class, digital learners might turn to YouTube tutorials or online forums to learn more.
Adaptive to Digital Evolution	Easily adjusts to new technological trends, tools, or platforms.	When a popular social media platform rolls out a new feature or interface change, digital learners are often among the first to try it, adapt, and even offer feedback.
Content Creators	Actively create and share digital content.	A student might create a video about their school trip, edit it, and then share it on platforms like Instagram, TikTok, or YouTube.
A Preference for Gamification	May enjoy elements of game design in non-game contexts (i.e. rewards, badges, and leader boards).	Might be more motivated to complete a reading assignment if they earn digital badges or points in a classroom management app.
Continuous Connectivity	An expectation or even habit of being constantly connected. May feel disoriented without internet access.	When faced with a question they can't answer, their immediate instinct might be to "Google it," even if it's in the middle of a conversation.

References

Student access to digital learning resources outside of the classroom. National Center for Education Statistics (NCES) Home Page, a part of the U.S. Department of Education. (n.d.). <https://nces.ed.gov/pubs2017/2017098/index.asp>

Bates, A. W. (Tony), & Bates, A. W. (2015, April 5). [10.2 Open Educational Resources \(OER\)](https://opentextbc.ca/teachinginadig...e/chapter/oer/). Teaching in a Digital Age.
<https://opentextbc.ca/teachinginadig...e/chapter/oer/>

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1.3.1: Teaching to Digital Learners

How Digital Learners Influence Teaching and Learning Practices

Digital learners have certain features and likes about how they learn best. By understanding these and using teaching methods that match their learning styles, teachers can make a classroom where all types of students can stay involved and remember what they learn. Using technology in school helps students in two ways. First, it helps them learn better since it works with their interests and skills with digital devices. Second, it teaches them important technology abilities they will need later in life and careers. So using technology well in education both supports students right now in school and prepares them for success after school.

In future chapters, we will dig deeper into strategies in integrating technology into teaching and learning. The following information and learning strategies are provided to give you more context as we delve deeper into the topics.

How People Learn (Bruno, 2015)

1. **Personalized Learning:** Understanding how each student prefers to learn, educators can design personalized learning paths that incorporate visual content, interactive activities, and opportunities for collaboration.
2. **Blended Learning:** Integrating digital tools with traditional teaching methods allows students to engage with content both in and outside the classroom, catering to their digital preferences.
3. **Micro-learning:** Delivering content in bite-sized, easily consumable formats accommodate shorter attention spans and aligns with a student's preference for quick access to information.
4. **Flipped Classroom:** Inverting the traditional classroom model by providing digital resources for self-study at home and using class time for discussions and activities capitalizes on the students' digital literacy.
5. **Digital Assessments:** Leveraging technology for assessments, such as online quizzes and interactive assignments, provides immediate feedback and aligns with digital students' familiarity with technology.

As we continue through this course, we will talk more in-depth about digital learning strategies, but the following are some ideas to get you started thinking about the concepts.

Digital Learning Strategies (USDOE, 2021)

- **Social Learning Platforms:** Utilize online discussion forums, group projects, and collaborative tools to foster social learning experiences and encourage knowledge-sharing among peers.
- **Mobile-Friendly Content:** Ensure that learning materials and platforms are mobile-friendly, as digital-native students often access educational resources on their smartphones.
- **Virtual Reality (VR) and Augmented Reality (AR):** Integrate VR and AR technologies to provide immersive learning experiences, enhancing student engagement and understanding.
- **Real-World Connections:** Connect classroom learning to real-world applications and current events using online resources, case studies, and multimedia presentations.
- **Digital Badges and Rewards:** Implement a system of digital badges or rewards for accomplishing specific learning milestones, motivating students to achieve their goals.
- **Data-Driven Insights:** Use learning analytics to track students' progress and identify areas where additional support or adjustments in teaching methods may be needed.

Access to Digital Resources

We must remember, that many of these tools depend on access to digital resources. Digital technology can help to break down geographical and economic barriers, if we provide the appropriate access to our learners. For example, students who have internet access and a device can attend lectures from anywhere from esteemed institutions like MIT or Harvard through online courses. **It is important to acknowledge that equity in access can be a huge barrier and that we cannot assume all learners have access.** In later chapters, we will discuss the concept of digital equity more in depth.

References

Bruno, P. (2015) [How People Learn](#). Edutopia.

US Department of Education, 2021. [Digital Learning Teacher Guide](#).

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SECTION OVERVIEW

1.4: Chapter Summary and Knowledge Check

Chapter 1 Wrap Up



In our rapidly evolving, technology-driven world, educators must acknowledge the transformative power of technology and digital media. This chapter highlights the imperative of effectively integrating technology to meet the educational needs of today's tech-savvy students. We explore the significance of computer technology and digital media, providing strategies and frameworks to facilitate your understanding and application. Additionally, you have gained insights into the distinctive characteristics and learning requirements of the digital generation.

For today - and tomorrow's - educators, embracing technology isn't a luxury; it's a necessity. It's about recognizing the changing landscape of the world and ensuring students are prepared, not just with facts and figures, but with the skills and adaptability they'll need in the future. However, it's crucial to integrate technology thoughtfully, ensuring that it adds value to the educational process and doesn't detract or distract from the core goal: meaningful learning. In this textbook, the goal is to help you understand how to effectively integrate technology into your teaching and learning by researching, planning, effectively integrating, gathering data and feedback and then analyzing that information to re-assess as needed.

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Check Yourself

Review the following questions to self-check your knowledge on the content in this chapter. The answers can be found at the bottom of this page.

Question 1: What potential benefit does technology offer in the context of education, particularly in terms of individualizing instruction and adapting to diverse student needs? A) Enhanced Engagement B) Access to Global Resources C) Personalized Learning D) Equity in Access

Question 2: Which challenge is associated with the overuse of technology in education and the potential neglect of critical thinking and interpersonal skills? A) Technical Issues and Support B) Over-reliance on Technology C) Training and Adaptation D) Online Safety and Security

Question 3: True or False - Successful technology integration in education necessitates a sound understanding and application of effective pedagogy, where technology serves to facilitate and enhance high-quality teaching fundamentals rather than replace them.

Question 4: When integrating technology into education, what is a key consideration to ensure active learning, involving students actively engaging in the learning process? A) Maintaining human connection and interaction B) Aligning technology with learning outcomes C) Selecting the most advanced tools D) Emphasizing passive consumption of information

Question 5: What characteristic of digital learners involves their innate understanding and comfort with digital technology, often grasping new tools without formal instruction? A) Multitasking Abilities B) Intuitive Tech Fluency C) Visual and Kinesthetic Learning Preferences D) Continuous Connectivity

Question 6: Match each strategy for leveraging technology with its corresponding description:

1. Mobile-Friendly Content
2. Real-World Connections
3. Virtual Reality (VR) and Augmented Reality (AR)
4. Interactive Multimedia
5. Data-Driven Insights
6. Social Learning Platforms
7. Digital Badges and Rewards

- A. Incorporate elements like videos, simulations, and gamified learning experiences to make the content more engaging and appealing.
- B. Utilize online discussion forums, group projects, and collaborative tools to foster social learning experiences and encourage knowledge-sharing among peers.
- C. Ensure that learning materials and platforms are accessible on smartphones, considering that digital-native students often use their phones to access educational resources.
- D. Integrate VR and AR technologies to provide immersive learning experiences, enhancing student engagement and understanding.
- E. Connect classroom learning to real-world applications and current events using online resources, case studies, and multimedia presentations.
- F. Implement a system of digital badges or rewards for accomplishing specific learning milestones, motivating students to achieve their goals.
- G. Use learning analytics to track students' progress and identify areas where additional support or adjustments in teaching methods may be needed.

Answers:

1: C, 2: B, 3. True, 4. A, 5. B, 6 (Matching): 1-C, 2-E, 3-D, 4-A, 5-G, 6-B, 7-F

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CHAPTER OVERVIEW

2: Communication Tools in Education

Chapter Learning Outcomes

- Integrate technology to create pedagogical change in teaching and learning

Introduction



This chapter will uncover the magic behind education communication tools that use apps, software, and platforms to make learning a breeze. We'll use educational communication tools through digital media, including applications, software, and platforms, to help communicate, collaborate, and share information. These tools use technology to simplify interaction, simplify administrative tasks, and create engaging learning experiences. In this chapter, we will look at some essential tools for education through digital media. Digital media has changed how we communicate, learn, and share information. It has created new ways for teachers, students, parents, and other stakeholders to connect in education. Different tools and platforms have transformed the traditional classroom into a dynamic, connected learning space. These digital tools make communication more organized and engaging in educational institutions. Teachers save time on tasks like scheduling. Students get new, fun ways of working together from anywhere. The right tools make educational institutions collaborative. Classes become interactive communities. Digital platforms give everyone flexible ways to learn and stay connected.

References

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[2.1: Introduction to Communication Tools in Education](#)

[2.1.1: Technology Infrastructure and Communication Tools](#)

[2.1.2: 2.1.2 Web 2.0](#)

[2.1.3: Internet of Things \(IoT\)](#)

[2.2: Synchronous Communication Tools](#)

[2.3: Asynchronous Communication Tools](#)

[2.4: Web 2.0](#)

[2.5: Assistive Technology Tools for Communication](#)

[2.6: Digital Media](#)

[2.7: Digital Communication Etiquette and Digital Citizenship](#)

[2.8: Chapter Summary and Knowledge Check](#)

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2.1: Introduction to Communication Tools in Education

Section Learning Objective

- Explore digital communication in education.

It is an exciting time for educational technology. There are many new learning tools: virtual and augmented reality, chatbots, predictive analytics, and personalized learning systems. The digital tools are changing how students learn and how schools communicate. These tools allow students, teachers, and parents to connect online. How can personalized and social learning be made to work together so that they complement rather than conflict? It means designing learning environments that encourage students to examine their personal learning goals and work to achieve mastery of a subject, not alone but alongside others with similar aims and contexts. Successful future learning environments will be based on a deep understanding of the science of learning, support students to set and meet their goals, offer a combination of personalized tuition and social learning, harness predictive analytics to assist teachers and students, and provide a delightful experience.

Some popular digital communication tools in education:

1. Learning platforms like Canvas and Blackboard. These let teachers share materials, assign work, give feedback, and more. Students can access resources, submit work, and join discussions.
2. Video chat programs like Zoom and Google Meet. These allow for online classes, meetings, and connecting classrooms.
3. Collaboration apps like Microsoft Teams. These let students and teachers message, file share, and work together on documents.
4. Blogs and journals. These allow students and teachers to share insights and track progress.
5. Social media. Platforms like Twitter and Facebook can update school communities to collaborate on documents and projects in real time.
6. Podcasts and webcasts. These deliver audio and video lessons.
7. Virtual reality. This creates interactive learning worlds for students to explore topics.
8. Discussion forums. These enable online conversations and peer learning.
9. Email and newsletters. These send important updates to students, parents, teachers, and administrators.
10. Interactive presentation tools. These visually engage students in online lessons.

With many digital options, schools can choose tools aligned to their needs and goals. When thoughtfully used, these tools can enrich how classrooms connect and collaborate.



References

Image created using Adobe Firefly: Digital communication in education

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2.1.1: Technology Infrastructure and Communication Tools

Learning Objectives

- Explore digital communication in education.
- Describe the pros and cons of digital and communication tools for teachers and students.

In education, technology infrastructure provides the backbone for communication tools to function. For example, a school's technology infrastructure might include servers and networks that support communication tools like email, messaging apps, and virtual classrooms. Combining a robust technology infrastructure and effective communication tools creates a connected and efficient learning environment.

Technology Infrastructure

Technology infrastructure refers to the underlying framework and components that support the operation of technology within an organization or system. It includes hardware (servers, computers, and networks), software (operating systems and applications), data storage systems, and connectivity solutions. The technology infrastructure provides the foundation for various IT processes and services, ensuring that different technologies work together seamlessly.

Communication Tools

Communication tools are applications, software, or platforms designed to facilitate the exchange of information and collaboration between individuals or groups. Email, messaging apps, video conferencing tools, project management software, and social media platforms are all communication tools. These tools enhance communication, streamline collaboration, and enable information sharing in various contexts, including education, business, and personal interactions.

Setting up Infrastructure and Connectivity

Here are some tips for setting up infrastructure and connectivity:

1. **Install wired and Wi-Fi networks:** Prioritize high bandwidth capacity to ensure fast, reliable access across all devices and classrooms.
2. **Set up charging stations:** Have enough power outlets and charging lockers so students can easily charge laptops, tablets, and phones.
3. **Get devices for students and teachers:** Provide enough laptops, tablets, and other devices to meet learning needs and upgrade older devices when needed.
4. **Choose apps and systems:** Select user-friendly apps, learning platforms, and systems that integrate well. Ensure they are compatible across devices.
5. **Automate tech support:** Software can automatically check device health, install updates, and fix issues, saving teachers and staff time.
6. **Train all users:** Provide educators, staff, and students with sufficient ongoing training on all new instructional technologies and address troubleshooting issues.
7. **Build system security:** Secure sensitive data and prevent external threats using encryption, backups, authentication controls, firewalls, and anti-virus software. Update often.
8. **Get spare equipment:** Have backup computers, cables, power supplies, tablets, and batteries readily available. Swap broken items out immediately when needed.
9. **Expand infrastructure over time:** Continue to upgrade bandwidth capacity, add new devices, enhance digital security features, and modernize equipment as needs grow.
10. **Set clear usage policies:** To prevent issues, have rules, restrictions, and policies on device usage. Digital citizenship and ethics education are key.



With the right infrastructure and policies, technology can better support online, blended, and digital learning models in schools. Routine assessments ensure tools stay current, secure, and sustainable.

Ubiquitous Connectivity

Ubiquitous connectivity refers to the idea that internet access is available everywhere, for everyone, at all times. It's the concept of being connected to the online world no matter where you are or what device you use.

Some key things to know about ubiquitous connectivity:

- Accessibility - Internet connectivity should be as readily accessible as electricity in homes, workplaces, public spaces, remote areas, etc.
- Continuity - You can remain connected, moving seamlessly between wi-fi, cellular data, and other access points without losing connectivity.
- Variety of devices - Connectivity should be available across smartphones, laptops, wearables, vehicles, appliances, sensors, and other Internet of things (IoT) objects.
- Speed and reliability - Ubiquitous connectivity relies on fast, reliable broadband and wireless networks that can handle many connected devices simultaneously with good quality service.
- Affordability - Widespread connectivity requires affordable data plans and reasonably priced connected devices and hardware.

Ubiquitous connectivity promises a world where virtually everyone and everything can transfer data easily and freely over the internet in real-time. It has revolutionary implications for knowledge, business, access to services, and the management of infrastructure, assets, and devices across smart cities, factories, agriculture, and more.

The future envisions ubiquitous connectivity powering technologies like self-driving cars, robotic assistants, augmented reality environments, biofeedback wearables, and adaptive smart homes that intuitively respond to assist us.

Connectivity at School

Here is a simplified version of key things to consider for connectivity in schools:

1. Internet access everywhere. Ensure wi-fi and wired networks cover all classrooms, offices, common areas, auditoriums, outdoor spaces, and buses. Prioritize capacity and speed.
2. Variety of devices. Support seamless connectivity across student and teacher laptops, tablets, phones, interactive whiteboards, printers, and security systems.
3. Reliable infrastructure. Build in redundancy with fiber optic wiring, several ISPs, and backup power generators. Make the network resilient.
4. Productivity software. Provide portals and secure cloud access to enable online learning tools, collaboration apps, messaging, and file-sharing.
5. User policies. Establish acceptable use policies and cyberethics training appropriate by age level to encourage digital responsibility.
6. Ongoing support. Keep infrastructure current with upgrades to bandwidth, security patches, and new devices. Provide IT teams, help desk support and teacher training.

With comprehensive access, robust underlying technology, and policies for safe use, connectivity empowers immersive, digitally enhanced education during class and beyond school walls. Evaluate connectivity regularly to enable administrators, educators, families, and students to participate fully in digital learning initiatives.

Connectivity at Home

1. High-speed internet that covers the whole home provides enough bandwidth for family needs and offers reliable connectivity without lags or dead zones. Look into available cable, DSL, and fiber optic plans.
2. A secure home Wi-Fi network with encryption and a strong password for access. Ensure all family devices and Internet of Things (IoT) gadgets connect safely.
3. Use quality routers and/or mesh Wi-Fi systems if necessary for larger homes, newer standards like Wi-Fi 6, or increased traffic demands from streaming. Position equipment optimally for range, too.

4. Family Internet policies like accepted use guidelines, content filters, time limits, and internet scheduling/pausing are helpful. Consider child-friendly Wi-Fi access options tailored to kids.
5. Firewalls, anti-virus programs, and other cybersecurity protections create a safe digital environment immune to malware, hacking, and identity theft.
6. Surge protectors and power backup equipment maintain electricity and protect against damage during outages or voltage spikes. They also prevent connectivity disruptions.

Evaluate home internet and network routinely for speed, quality of access, and bandwidth needs as usage evolves. Discuss priorities around connectivity costs, accessibility needs, and emerging smart home technologies with families.

References

Department of Education. Office of Educational Technology. <https://tech.ed.gov/>

Image created using Adobe Firefly: Digital communication in the classroom

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2.1.2: 2.1.2 Web 2.0

What is the "Web 2.0?"

Web 2.0 refers to the more interactive, collaborative internet that emerged in the early 2000's. It describes websites and services that let users create, share, and engage with digital content and communities. Unlike the original Web 1.0's static pages, Web 2.0 allows participation. People can upload videos to YouTube, post social media updates, edit wiki articles, comment on blogs, and more.

Some main features of Web 2.0 include:

- Social networking sites like Facebook and Instagram
- Blogs and wikis
- Video/photo-sharing platforms like YouTube and TikTok
- Review sites like Yelp and TripAdvisor
- Live messaging and chat apps
- Creative tools that let anyone make websites or blogs

On Web 2.0, visitors become contributors. Users provide content and data that add value as they use an app or platform. This makes websites feel more dynamic, social, and personalized. With user participation at its core, Web 2.0 gave rise to community-driven sites, user-generated content, viral memes, two-way conversations between brands and audiences, and more. It made the internet not just a place to consume but a place to create, share, and connect.

Characteristics of Web 2.0

Unlike old static websites, Web 2.0 sites are interactive and encourage users to participate actively. Some main ways users can contribute:

- Comment on blog posts, news articles, and other content
- Create user accounts and profiles
- Upload their photos, videos, writing, etc.

By making participation easy and engaging, Web 2.0 sites feel more:

- Social - With user profiles, commenting, messaging
- Dynamic - With constantly updated, user-created content
- Personalized - With customized feeds and preferences

Other Web 2.0 features include:

- Social media platforms
- Blogging and website builders
- Tagging and organizing content with labels
- "Like" and reaction buttons
- Bookmarking favorite sites and sharing collections

The goal is to get users to add value by posting, customizing, reviewing, tagging, uploading, and sharing. This user-generated content and data is core to Web 2.0.

Some sites even require participation and contributions as a condition for access. Overall, Web 2.0 makes the internet not just a place to read and watch but also create, connect, and participate.

The key features of Web 2.0 include:

1. Folksonomy - Users collectively tag and categorize content, which helps organize information and aids searchability.
2. Rich user experience - Dynamic, interactive content responds to user input. For example, clicking an image enlarges it.
3. User participation - Users contribute reviews, comments, and their own content through wikis, posts, uploads, etc. There is two-way sharing between sites and users.
4. Software as a service (SaaS) - Sites have APIs so other services, apps, and mashups can access or share their content.



5. Mass participation - Web 2.0 opened the internet up to participation from all types of users beyond just tech experts. This led to rapid growth.

In summary, Web 2.0 sites encourage participation, sharing, interactivity, and collaboration at scale. Users are contributors instead of just passive viewers of content. The value comes from the engagement between real-world people creating, customizing, remixing, and distributing digital content and ideas.

References

[Web 2.0 - Wikipedia](#). *Creative Commons Attribution-ShareAlike License 3.0*;

Image created using Adobe Firefly: Depiction of Web 2.0.

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2.1.3: Internet of Things (IoT)

What is the Internet of Things (IoT)?

You will hear the term Internet of Things, also referred to as IoT, as you explore technology. This quick explanation and video will help you better understand the

The Internet of Things (IoT) refers to physical devices connected to the internet to collect and share data. These "smart devices" have sensors and internet connectivity that allow them to communicate, analyze information, and take actions based on incoming data.

Some examples of Internet of Things devices include:

- Smart home products like WiFi-enabled appliances, lights, thermostats, and security systems. They can be controlled from your phone.
- Fitness trackers and health monitors that collect your activity data and vital signs.
- Autonomous vehicles with internet connectivity for navigation, entertainment, and performance monitoring.
- Industrial machines and infrastructure embedded with sensors to optimize performance.

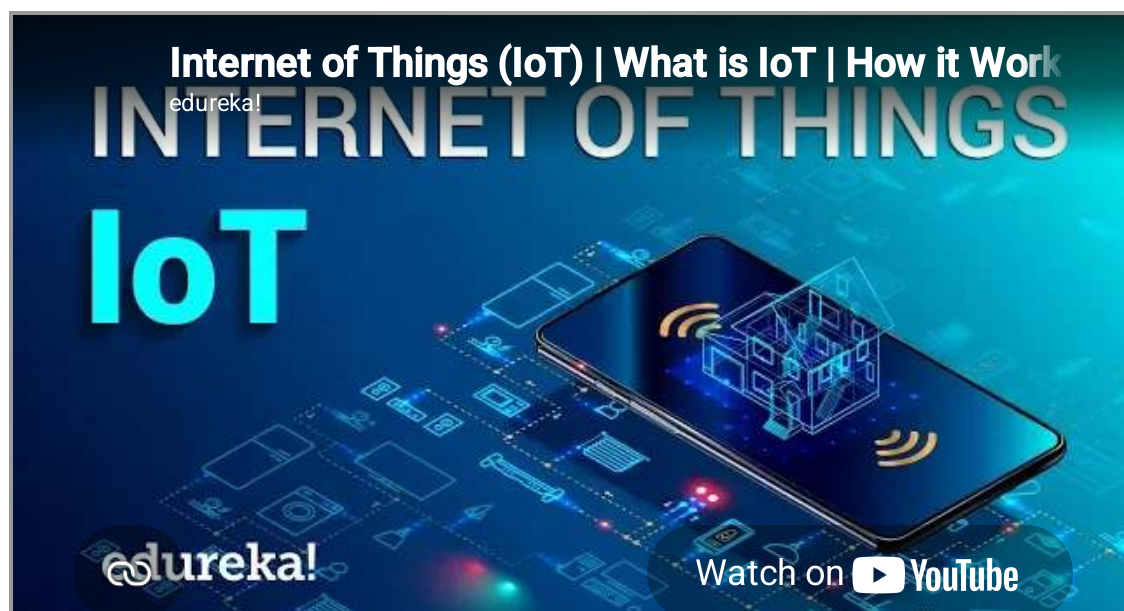
Even though the name contains the word "Internet," IoT devices don't need to be on the public internet. They can be on local networks and still identify themselves and interact with other connected devices.

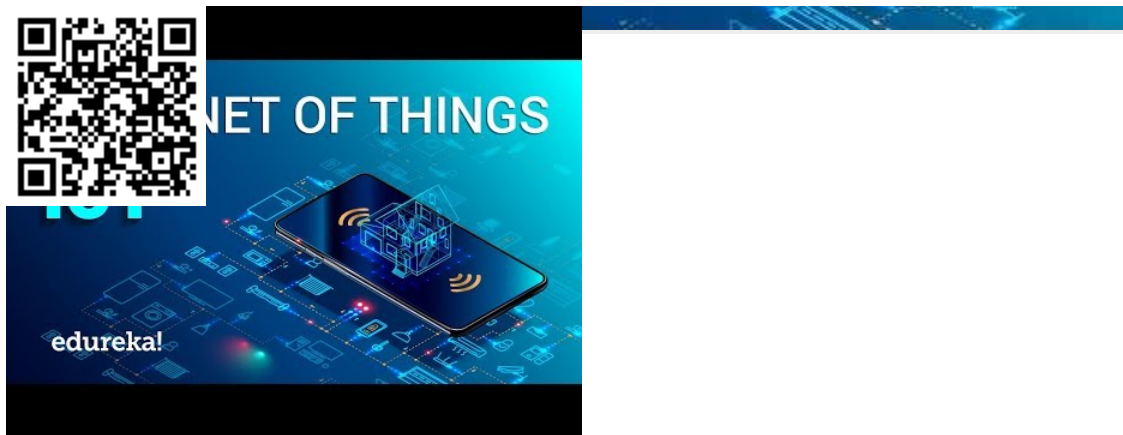
The Internet of Things allows everyday objects to collect useful data and make processes more efficient based on that real-time data. It demonstrates the power of connecting the physical and digital worlds via embedded sensors and communications technology.

For schools, IoT could enable smarter energy use, enhanced security, attendance-taking, building automation, interactive projects, and more. The possibilities are constantly expanding.

In the consumer market, IoT technology is most synonymous with products about the concept of the "smart home," including devices and appliances (such as lighting fixtures, thermostats, home security systems, cameras, and other home appliances) that support one or more common ecosystems and can be controlled via devices associated with that ecosystem, such as smartphones and smart speakers. IoT is also used in healthcare systems.

Watch this short video on the Internet of Things (IoT). [video 3:54 minutes. Closed Captioned]





References

Content adapted from [Internet of Things - Wikipedia Creative Commons Attribution-ShareAlike License 3.0](#)

Image created using Adobe Firefly: The internet of things in a home.

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2.2: Synchronous Communication Tools

Introduction

Here is an overview of some standard synchronous communication tools:

- **Video conferencing tools:** Allow real-time video/audio communication between two or more people in different locations. Examples include Zoom, Microsoft Teams, Google Meet, Skype, and Webex. These facilitate meetings, presentations, collaboration, etc.
- **Chat/instant messaging tools:** Allow real-time text-based communication. Popular platforms include Slack, Microsoft Teams chat, Skype chat, WhatsApp, Facebook Messenger, etc. These allow quick conversations and collaboration.
- **Phone/voice calls:** One of the original synchronous communication mediums. Allows real-time voice conversations between two or more parties. Landline phones, mobile phones, and Voice over IP services facilitate voice calls.
- **Screen sharing tools:** Allow real-time, visual sharing of one's screen/display for collaboration, presentations, etc. Common examples include Zoom, Microsoft Teams, and Skype screen share options. Dedicated screen sharers like Zoom's screen share option also exist.
- **Online whiteboard tools:** Allow real-time, visual collaboration by sharing a virtual whiteboard. Participants can draw, write, and brainstorm visually. Examples include Microsoft Whiteboard, Miro, and Mural.
- **Virtual worlds:** Persistent 3D virtual environments that allow real-time interaction through avatars. Second Life is a famous example.

Key benefits of synchronous tools are real-time communication, instant feedback, the ability to read visual/non-verbal cues, and improved engagement. Challenges can be scheduling aligning different time zones and tech scalability issues for large groups. (Claude)

Synchronous Communication Offered by Canvas and Other Learning Management Systems

Learning Management Systems (LMS) like Canvas also offer options for synchronous communication. This places the instructor and students (or just students in some cases) in the exact online location where they can immediately respond to each other in a face-to-face classroom. The Chat tool is an always-on, text-only page within Canvas that anyone enrolled in a class can use. Adding Chat to Course Navigation is available on the Settings page. Note that all comments posted to the Chat tool are recorded and cannot be deleted.

A more fully functional tool for synchronous communication is Conferences, which includes a full suite of tools for live online lectures. However, the native Canvas tool is not recommended at this time. It is integrated with a program called BigBluebutton, which has not been evaluated to see if it meets California standards for universal design. Also, the default license is for recordings that cannot be downloaded and are retained for only two weeks, so an institution would need its contract to make the tool usable by students interested in reviewing archives of recorded sessions.

A better option for synchronous communication for California's community colleges is to link to the tools CCC Confer and ConferNow, which use the technology platforms Blackboard Collaborate and Zoom, respectively. These tools can be integrated via LTI with Canvas and are supported by the state chancellor's office. Please note that ConferNow is not yet certified as universally accessible.

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2.3: Asynchronous Communication Tools

Introduction

Tools like Discussion, Announcements, and the Calendar are different ways of communicating asynchronously with students, meaning not at the same time. Asynchronous communication helps distance education fulfill its potential in the area of expanding access, as the tyranny of time is often why students take online classes.

Here is an overview of some common asynchronous communication tools:

- **Email:** It is one of the most popular asynchronous communication tools. It allows sending messages, attachments, links, etc., which the recipient can view and respond to on their own time.
- **Discussion/Message boards:** Online forums where multiple people can hold conversations over time by posting messages. Popular platforms include Reddit, Quora, forums in Canvas learning management systems.
- **Blogs/Vlogs:** These are online journals updated consistently by an author and viewed by readers asynchronously. Platforms like WordPress and Blogger enable the creation of blogs, and YouTube videos are consumed asynchronously.
- **Shared documents:** Docs stored in cloud platforms like Google Drive, Office 365, Dropbox etc. allow teams to collaborate by editing shared files without being online at the same time. Versions can be compared.
- **Project management tools:** Platforms like Trello, Asana, Basecamp etc. Provide shared team workspaces to communicate on projects asynchronously through task lists, notifications, file sharing and more.
- **Voicemail/Answering machine:** Allow leaving spoken messages for someone to listen to later. Enable asynchronous audio communication.
- **Text messages:** SMS/online messaging apps like WhatsApp enable asynchronous written conversations as users aren't expected to respond in real-time.



Key benefits are flexibility, ability to compose thoughtful responses and the record it provides. Challenges can be miscommunications without real-time clarification, feeling disconnected from team members.

The tools allow teams to share information and advance work without members being available at one time. This supports asynchronous collaboration.

References

Image created using Adobe Firefly: asynchronous including email, message boards, and text messages.

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2.4: Web 2.0

What is the "Web 2.0?"

Web 2.0, also known as participative (or participatory) web or social web, refers to websites that emphasize user-generated content, ease of use, participatory culture, and interoperability (i.e., compatibility with other products, systems, and devices) for end-users.

The term was coined by Darcy DiNucci in 1999 and later popularized by Tim O'Reilly and Dale Dougherty at the first Web 2.0 Conference in late 2004. Although the term mimics the numbering of software versions, it does not denote a formal change like the World Wide Web, but merely describes a general change that occurred during this period as interactive websites proliferated and came to overshadow the older, more static websites of the original Web.

A Web 2.0 website allows users to interact and collaborate with each other through social media dialogue as creators of user-generated content in a virtual community. This contrasts with the first generation of Web 1.0-era websites where people were limited to viewing the content in a passive manner. Examples of Web 2.0 features include social networking sites or social media sites (e.g., Facebook, Instagram, Tik Tok, etc.), blogs, and wikis, video sharing sites (e.g., YouTube), image sharing sites (e.g., Unsplash, Pixabay), hosted services, Web applications ("apps"), collaborative consumption platforms, and mashup applications.

Characteristics of Web 2.0

Instead of merely reading a Web 2.0 site, a user can contribute to the site's content by commenting on published articles or creating a user account or profile, which may increase participation. By emphasizing these already-extant capabilities, they encourage users to rely more on their browser for user interface, application software ("apps"), and file storage facilities. This has been called "network as platform" computing. Significant features of Web 2.0 include social networking websites, self-publishing platforms (e.g., WordPress' easy-to-use blog and website creation tools), "tagging" (which enables users to label websites, videos or photos in some fashion), "like" buttons (which will allow a user to indicate that they are pleased by online content), and social bookmarking. Please watch the video below (7:06 mins.)



What is Web 2.0?
youngmath

- **Social Interaction**
 - Social Networking (e.g. My Space / Facebook)
 - Blog Commenting
 - Collaboration (wikis, Google Docs)
 - Discussion Forums
 - Media-based social networks (e.g. You Tube)

Watch on  YouTube



Users can provide the data and exercise some control over what they share on a Web 2.0 site. These sites may have an "architecture of participation" that encourages users to add value to the application as they use it. Users can add value in many ways, such as uploading their content on blogs, consumer-evaluation platforms (e.g., Amazon and eBay), news websites (e.g., responding in the comment section), social networking services, media-sharing websites (e.g., YouTube and Instagram) and collaborative-writing projects. Some scholars argue that cloud computing is an example of Web 2.0 because it simply implies computing on the Internet.

According to Best, Web 2.0's characteristics are rich user experience, user participation, dynamic content, metadata, Web standards, and scalability. Further characteristics, such as openness, freedom, and collective intelligence through user participation, can also be viewed as essential attributes of Web 2.0. Some websites require users to contribute user-generated content to have access to the website to discourage "free riding."

The key features of Web 2.0 include:

1. Folksonomy – free classification of information; allows users to collectively classify and find information (e.g., "tagging" of websites, images, videos, or links)
2. Rich user experience – dynamic content that is responsive to user input (e.g., a user can "click" on an image to enlarge it or find out more information)
3. User participation – information flows two ways between the site owner and site users through evaluation, review, and online commenting. Site users also typically create user-generated content for others to see (e.g., Wikipedia, an online encyclopedia that anyone can write articles for or edit)
4. Software as a service (SaaS) – Web 2.0 sites developed APIs to allow automated usage, such as by a Web "app" (software application) or a mashup
5. Mass participation – near-universal web access leads to differentiation of concerns from the traditional Internet user base (who tended to be hackers and computer hobbyists) to a broader variety of users.

Social Media

A Web 2.0 website allows users to interact and collaborate through **social media dialogue** as creators of user-generated content in a virtual community. This contrasts with the first generation of Web 1.0-era websites, where people were limited to passively viewing the content. Examples of Web 2.0 features include social networking sites or social media sites (e.g., Facebook, Instagram, TikTok, etc.), blogs and wikis, video sharing sites (e.g., YouTube), image sharing sites (e.g., Unsplash, Pixabay), hosted services, Web applications ("apps"), collaborative consumption platforms, and mashup applications.

Please watch the video below (2:35 mins.)



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2.5: Assistive Technology Tools for Communication

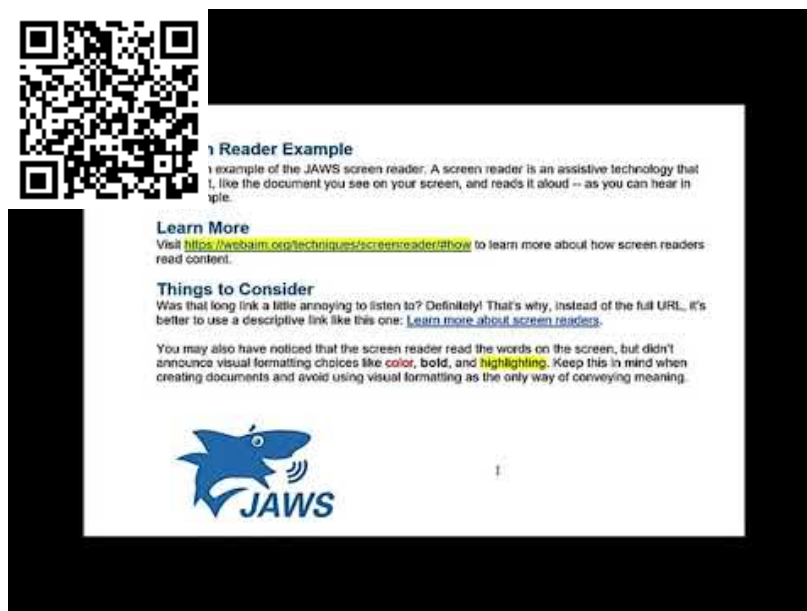
What are Assistive Technologies?

Assistive technologies are devices, software, or equipment that help people with disabilities perform tasks and improve their quality of life. These tools enhance learning, communication, and daily activities for individuals with various physical, cognitive, or sensory impairments. Examples include screen readers, speech recognition software, alternative input devices, and augmentative communication systems. Assistive technologies aim to increase independence, participation, and access to education, work, and social environments for people with disabilities.

How Can a Blind or Visually Impaired Person Access the Graphical Web?

Blind or visually impaired individuals can access the graphical web using assistive technologies like screen readers, which convert text to speech or braille. Other tools include screen magnifiers, text-to-speech software, and braille displays. Web accessibility features such as alt text for images, properly structured HTML, and keyboard navigation also play crucial roles. Websites designed with accessibility in mind, following guidelines like WCAG, ensure that visual content is described textually and that the site's structure is navigable without relying on visual cues. This allows visually impaired users to understand and interact with web content effectively.

Please watch this short video that shows the JAWS screen reader. [Video: 48 seconds. Closed Captioned.]



Apps for Accessibility

Apps for accessibility enhance digital experiences for people with disabilities. These applications range from screen readers and magnifiers for visual impairments to speech-to-text tools for hearing or motor difficulties. Some apps provide alternative communication methods, while others offer navigation assistance or simplify device interactions. Popular examples include VoiceOver (iOS), TalkBack (Android), Be My Eyes, and Seeing AI. These apps aim to make technology more inclusive, allowing users with various disabilities to access information, communicate, and perform daily tasks more independently. Developers increasingly focus on creating accessible apps or integrating accessibility features into mainstream applications to promote digital equality.

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2.6: Digital Media

Digital media has revolutionized communication, learning, and information sharing in the modern era. Digital media has opened up new avenues for effective communication and engagement between educators, students, and parents in education. Various communication tools and platforms have emerged, transforming the traditional classroom into a dynamic and interconnected learning environment.

1. **Learning Management Systems (LMS):** LMS platforms like Moodle, Canvas, and Blackboard provide educators with a centralized hub to manage course content, assignments, assessments, and communication. Students can access course materials, participate in discussions, submit assignments, and receive feedback within the LMS.
2. **Video Conferencing and Webinar Tools:** Zoom, Microsoft Teams, and Google Meet enable real-time virtual interactions between educators and students. They facilitate live lectures, discussions, presentations, and Q&A sessions, bridging geographical gaps and promoting active engagement.
3. **Messaging and Collaboration Apps:** Applications like Slack, Microsoft Teams, and Google Workspace (formerly G Suite) offer instant messaging, file sharing, and collaborative document editing. Educators and students can communicate efficiently and work together on projects regardless of their physical location.
4. **Blogs and Online Journals:** Blogging platforms allow educators and students to share thoughts, insights, and reflections on various topics. Blogs can serve as digital portfolios, showcasing students' progress and achievements.
5. **Social Media Platforms:** Social media applications can facilitate communication and community-building within educational contexts. Educators can share announcements and resources and engage in discussions on Twitter, Facebook, and Instagram.
6. **Podcasts and Webcasts:** Audio and video podcasts provide an alternative medium for delivering educational content. Educators can create informative podcasts to explain complex concepts, conduct interviews, and share expert insights.
7. **Virtual Reality (VR) and Augmented Reality (AR):** These immersive technologies allow educators to create interactive learning experiences. Students can explore virtual environments and manipulate digital objects, enhancing their understanding of subjects.
8. **Online Discussion Forums and Boards:** Platforms like Reddit, Discourse, and online course forums promote asynchronous communication, enabling students to engage in thoughtful discussions and peer-to-peer learning.
9. **Email and Newsletters:** Traditional email communication remains valuable for sharing important updates, announcements, and resources with students and parents.
10. **Interactive Whiteboards and Presentation Tools:** Tools like Microsoft Whiteboard and Prezi enable educators to create visually engaging presentations and collaborate in real-time with students, enhancing content delivery.

It's crucial for educators to carefully select and integrate appropriate communication tools based on their learning objectives, audience preferences, and the nature of the content. While digital media offers numerous benefits, educators should consider issues such as digital accessibility, data privacy, and digital literacy when implementing these tools in educational settings. When used effectively, communication tools in education using digital media can enrich the learning experience, foster collaboration, and prepare students for the demands of the digital age.

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2.7: Digital Communication Etiquette and Digital Citizenship

Understanding and practicing digital communication etiquette and citizenship are not just buzzwords in today's interconnected world. They are crucial pillars that uphold the integrity and harmony of our online interactions and activities. Let's delve deeper into these significant topics:

Digital Communication Etiquette:

1. Be respectful and professional in your language and tone.
2. Use proper grammar, spelling, and punctuation to communicate clearly.
3. Be mindful of your audience and adjust your communication style accordingly. 4. Avoid using all caps, as it can be perceived as shouting.
4. Be cautious with humor and sarcasm, as they can be misinterpreted without nonverbal cues.
5. Respect others' privacy and confidentiality.
6. Respond to messages promptly, when appropriate.

Digital Citizenship:

1. Protect your personal information and be cautious about what you share online.
2. Respect others' intellectual property rights, including copyright and trademarks.
3. Be a responsible consumer of online content, verifying sources and facts. 4. Engage in positive and constructive online discussions, avoiding trolling and flaming.
4. Stand up against cyberbullying and report inappropriate behavior.
5. Maintain a positive digital footprint, which can impact your personal and professional life.
6. Be active in online communities, contributing to the creation and sharing of knowledge.
7. Stay informed about digital technologies and their impact on society.

By actively embracing and embodying good digital communication etiquette and digital citizenship, we can create a digital environment that is not just safer and more inclusive, but also more productive and enjoyable for everyone. Remember, our actions and words online have real-world consequences, and by striving to create a positive digital culture, we can make a tangible difference that benefits society as a whole.



References

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SECTION OVERVIEW

2.8: Chapter Summary and Knowledge Check

Chapter 2 Wrap Up



This chapter highlights how digital media, including apps, software, and platforms, has revolutionized communication, learning, and information sharing in educational settings, enabling teachers, students, parents, and other stakeholders to connect in new and innovative ways. Thanks to various digital tools and platforms, the traditional classroom has evolved into a dynamic, connected learning space. These tools simplify interaction, streamline administrative tasks, and create engaging learning experiences by harnessing technology. They enhance communication within educational institutions, making it more organized and engaging. Teachers benefit from time-saving features for tasks like scheduling, while students gain access to new and exciting ways to collaborate from any location. By selecting the right tools, educational institutions can foster a collaborative environment where classes become interactive communities, and digital platforms provide everyone with flexible ways to learn and stay connected. The chapter concludes by emphasizing the importance of schools carefully selecting digital tools that align with their specific needs and goals to maximize the benefits of these technologies in the classroom.

Check Yourself

Please review the following questions to check your knowledge of the content in this chapter. The answers can be found at the bottom of this page.

Question 1: How are digital tools changing how students learn and schools communicate?

Question 2: How do digital communication tools benefit teachers?

Question 3: What are some benefits of using video chat programs like Zoom and Google Meet in education?

Question 4: How can social media platforms be used in education?

Question 5: What is the importance of schools carefully selecting digital tools?

Question 6: What can educational institutions achieve by selecting the right digital communication tools?

Answers:

- 1: Digital tools allow students, teachers, and parents to connect online, enabling access to resources, submission of work, participation in discussions, and collaboration on projects.
- 2: Digital communication tools help teachers save time on tasks like scheduling and make communication more organized and engaging.
- 3: Video chat programs allow online classes, meetings, and connecting classrooms, facilitating remote learning and collaboration.
- 4: Social media platforms like Twitter and Facebook can be used to update school communities and collaborate on documents and projects in real time.
- 5: Schools should carefully select digital tools that align with their specific needs and goals to maximize the benefits of these technologies in the classroom and ensure they enrich how classrooms connect and collaborate.
- 6: By selecting the right digital communication tools, educational institutions can foster a collaborative environment where classes become interactive communities, and digital platforms provide everyone with flexible ways to learn and stay connected.

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CHAPTER OVERVIEW

3: Software and Apps for Education

Chapter Learning Outcome

- Develop problem-solving and inquiry learning using digital media and educational technology.

In this chapter, you will explore how educators and learners can work to connect the potential opportunities of our rapidly advancing software and apps and our teaching and learning practices. We dig deeper into apps and software specifically tailored for specific topics and subjects, working to help ensure that your digital tools align with your curriculum needs. It is not, however, just about finding the right tools; it's about understanding their pedagogical value. Not all digital tools are created equal, and in this chapter, we will research and use some evaluation tools to help you determine which apps and software uphold effective teaching methodologies and best practices.

As part of our app exploration, we will also look at graphic authoring and editing software, which can help you enhance your lessons with visuals. By the end of this chapter, you'll be well-versed in making informed choices about integrating technology into your teaching and learning practices, helping to ensure a dynamic and engaging learning experience for your students.

[3.1: Software Evaluation Criteria](#)

[3.2: Incorporating Educational Apps into the Curriculum](#)

[3.3: Analyzing the Effectiveness of Educational Apps](#)

[3.4: Introduction to Graphic Authoring and Editing Software](#)

[3.5: Creating Visual Content with Graphic Authoring Software](#)

[3.6: Chapter Summary and Knowledge Check](#)

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3.1: Software Evaluation Criteria

Software Evaluation Criteria

Section Learning Objectives

- Explore curriculum-specific educational apps and software.

Before you even begin looking at software and application to use in your teaching and learning strategies, stop and ask yourself the following questions: Why do I want to use an app or software in my teaching and learning? How will it benefit me and my students? Where can I find reputable software and apps? How do I know if the software or application (app) functions the way I want it to? How do I decide whether a specific software or app will enhance our teaching and learning? So many questions! Selecting the right app requires an understanding of the evaluation criteria. So, how do we determine the evaluation criteria? Luckily, there are those that have done this for years and can lend us their expertise and experiences!

In this section, we will begin our discussion for each of these questions. As we continue through this chapter and the textbook, we will dig deeper into the topics and questions.



Figure 3.1.1: Evaluation Criteria for Educational Technology by Renee Albrecht. Licensed under CC BY.

Identifying your Goals

Understanding and developing your goals and reasons for integrating or using an educational app or software should be the first step you take (Franker, n.d.).

- **What do I want to achieve? (Purpose-Driven Selection).** Before diving into the vast ocean of educational apps and software, it's crucial to know what you're looking to achieve. Is it enhancing reading skills, improving mathematical abilities, or fostering creativity? Identifying goals narrows down choices, making the selection process more efficient. This is the first step in aligning the technology to your learning outcomes.
- **How does this support learning? (Maximized Learning Outcomes).** When you align software with specific learning objectives, students are more likely to meet or exceed those objectives. For instance, if the goal is to enhance vocabulary, an app designed specifically for vocabulary expansion is likely to produce better results than a generic language learning app.
- **Do I have the resources to support this? For low long? (Efficient Resource Utilization).** Time and resources are always limited in educational settings. By choosing apps and software that align with your teaching goals, you ensure that both are utilized to their fullest potential, without wasting efforts on tools that won't meet your needs. For example, a more complex app or software might take longer to learn and implement.

Researching and Finding Software and Apps

It's essential to know where and how to find educational apps that can be beneficial for learning. Here are some ways to get started:

- **Search Engines:** Simple Google searches can lead you to lists of educational apps. For example, if you're looking for math apps for high school students, you might type "best math apps for high school" into the search bar.
- **App Stores:** Platforms like the Apple App Store or Google Play have categories dedicated to educational apps. Browsing through these categories can provide a plethora of choices.

- **Educational Websites:** Some websites, like Common Sense Media or Edutopia, offer reviews and lists of apps specifically designed for learning. They often categorize these by age, subject, or skill.

Analyzing and Evaluating Educational Apps

After identifying potential software and apps, the next step is determining if they are **good quality** and **relevant to your needs**. We will dig deeper into this topic as we move through the chapter, however, the following list will help you begin to think about analyzing and evaluating the software and apps. Here are some things to consider:

- **Accessibility:** Ensure that the software or app meets the required Section 508 accessibility guidelines. Most reputable software and apps will have what is called a VPAT (Voluntary Product Accessibility Template), or similar information. A VPAT is a standardized form shared by organizations to detail how their software or digital tool complies with the accessibility standards outlined in Section 508 of the Rehabilitation Act. It serves as a benchmark for organizations to evaluate the accessibility of a product for individuals with disabilities.
- **Reviews and Ratings:** A quick way to gauge an app's quality is by looking at user reviews and ratings. For instance, an app with a 4.8-star rating and numerous positive reviews might be worth considering.
- **Content Relevance:** Ensure the app's content aligns with what you want to learn. For example, if you're studying American History, software or an app that focuses primarily on European History might not be the best fit.
- **Ease of Use:** An app should be user-friendly. Check if it has an intuitive user (and administrator) interface. For instance, a language-learning app that offers step-by-step lessons with clear instructions would be more beneficial than one that's hard to navigate. Or perhaps a geography app that clearly labels countries and offers easy-to-access quizzes may be more effective than one with a cluttered design.
- **Visual Appeal and Interface:** The design and visual appeal of an app play a crucial role in user engagement. An aesthetically pleasing interface can make learning more enjoyable. For example, an art history app with high-resolution images and a visually engaging layout can enhance the learning experience compared to one with pixelated images and a dull design.
- **Credibility:** Check the app's source. An app developed by a well-known educational institution or experts in the field is more likely to offer accurate and reliable content. For example, an English grammar app backed by a recognized university could be a trustworthy choice.
- **Cost vs. Value:** Some apps might be free, while others may have a cost. It's important to evaluate if the app's content and features justify any potential expenses. For example, a math app might be worth the investment if it offers detailed tutorials, quizzes, and real-time feedback.

References

Franker, K. (n.d), [Tech Tips Newsletter: Educational Apps](#), University of Wisconsin - Stout.

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3.2: Incorporating Educational Apps into the Curriculum

Section Learning Objectives

- Explore curriculum-specific educational apps and software.
- Identify sound pedagogy in educational applications and software.

Educational apps can provide engaging ways to enhance classroom teaching when thoughtfully incorporated into the curriculum. In this section, we will explore some strategies for integrating apps and designing app-based activities aligned to learning goals.

Integrating Apps into Teaching and Learning

When integrating apps into the classroom, educators should be thoughtful in their selection, alignment, and usage to effectively supplement instruction. Following best practices for incorporation, expectations, progress monitoring, and skill building will allow apps to enrich traditional learning as impactful tools for today's students.

When integrating apps, consider these following strategies:

- **Match apps to curriculum standards and learning objectives.** Select apps with content and skills that directly connect.
- **Determine appropriate usage.** Use apps for introduction to new content, reinforcement of skills, assessment, or expansion through enrichment.
- **Blend app time with other activities.** Strike a balance between app learning and traditional instruction.
- **Set expectations.** Provide guidelines for app use and learning goals to focus student effort.
- **Monitor progress.** Review student app metrics and usage to ensure proper alignment and effectiveness.
- **Build technology skills.** Teach students how to use apps proficiently first before integrating them into lessons.

Aligning Apps to Curriculum Goals

Picking apps that match what students are learning in class is crucial for success. Checking that apps fit your students' grade level, customize to their needs, and provide data to assess progress will ensure apps help students meet curriculum goals.

Review the following suggestions for ways that you can help ensure that you are aligning apps to the curriculum goals.

- **Content covered in app?** Selecting apps that teach/reinforce the same knowledge and skills addressed in current curriculum standards and learning goals.
- **Grade level or age level?** Matching app content to the grade level and abilities of your students. Seek age-appropriate challenges.
- **Customization opportunities?** Considering customization capabilities to personalize app content to individual student needs.
- **Analytics and/or dashboard?** Reviewing analytics from apps to assess if students are achieving curriculum goals based on performance data.

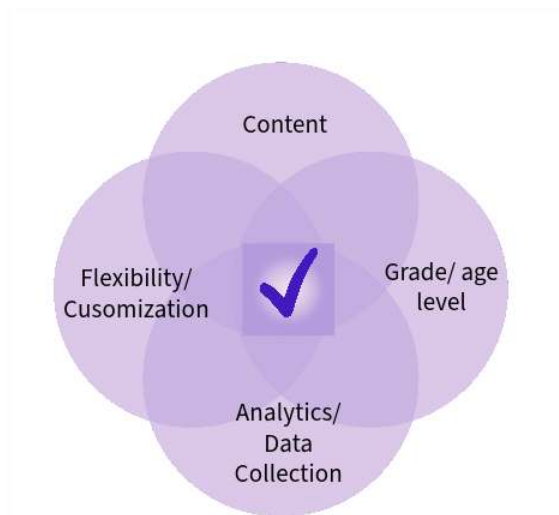


Figure 3.2.1: Software and App Alignment to Curriculum by Renee Albrecht. Licensed under CC BY.

Designing App-Based Activities

Apps can make lessons and tests more interesting when tied to learning goals. Students can use apps to reflect, play games, work in groups, or complete projects and assignments targeted to what they're studying. Here is a high level list of some ideas for creating engaging lesson and assessment ideas with apps.

- Design app-based assignments and projects, tied directly to learning objectives.
- Have students reflect on app experiences through journaling, discussion, or media creation.
- Use apps as centers or stations during classroom rotations.
- Create app-based educational games or competitions.
- Develop collaborative group activities with apps.

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3.3: Analyzing the Effectiveness of Educational Apps

Section Learning Objectives

- Analyze educational apps and software to determine their pedagogical soundness and effectiveness.
- Identify sound pedagogy in educational applications and software.

Educational apps and software are increasingly prevalent in classrooms and homes, but how can we tell if they are actually benefiting student learning? In this section, we will explore methods for analyzing the impact of educational apps on student engagement, learning outcomes, and performance.

Assessing Impact and Effectiveness

When selecting educational apps, it's important to gather data and assess their influence on students. Here are some ways to analyze effectiveness:

- **Student engagement** - Observe and document how long students engage with the app, their level of interest, and signs of enjoyment/boredom. Compare engagement levels to other technology-based as well as non-technology based learning activities.
- **Learning outcomes** - Assess student knowledge before and after using the app through quizzes, assignments, or other assessments. Document and review results. Where there improvements or decline? Be sure to fully document, including any other circumstances that may impact performance.
- **Performance data** - Review scores, levels completed, badges earned, and other metrics within the app. Look for progress over time.
- **User feedback** - Survey students on their perceptions of the app's helpfulness, ease of use, like/dislike, and areas for improvement.

Analyzing Pedagogical Quality

In addition to the influence on student learning, be sure to analyze the app's design and pedagogy:

- **Alignment to standards/curriculum** - Ensure app content matches grade-level standards and curriculum goals.
- **Learning theory foundations** - Determine if the app applies sound learning theories like active learning, spaced practice, feedback, and more.
- **Instructional design** - Review if the app follows principles of effective instructional design, such as defining learning objectives, organizing content, providing practice, guiding feedback, and assessing comprehension.
- **Customization** - Check if the app adapts to individual student needs and allows personalized learning paths and assignments.
- **Data privacy and security** - Confirm the app protects student data privacy through encryption, access controls, and transparency policies.

Reflecting on Strengths and Limitations

You have gathered the data. What are your next steps? After reviewing and analyzing student performance data and pedagogical quality indicators, identify **both the strengths and limitations** of the educational app. Reflect on any areas for improvement to inform future selection and implementation decisions. Continually reevaluate apps to ensure they remain impactful over time as student needs evolve. Carefully selecting and analyzing educational apps is crucial for identifying those that positively influence student engagement, learning, and performance through sound pedagogical approaches. Ongoing collection of student learning data, combined with an evaluation of instructional design and customization capabilities, allows the determination of app effectiveness and opportunities for improvement. This supports better-informed adoption that maximizes educational technology benefits for all students.

The following graphic was introduced in Chapter 1 and applies to this topic as well: research and plan, implement, gather data and feedback, evaluate, re-assess and update plans as necessary.



Figure 3.3.1: Cycle of effective technology integration by Renee Albrecht. Licensed under CC BY.

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3.4: Introduction to Graphic Authoring and Editing Software

Section Learning Objective

- Explore graphic authoring and editing software.

Graphic authoring and design software provide powerful tools for creating and editing images, illustrations, layouts, and more. In this, and the next section, we will look at some common tools and how they can be utilized in educational contexts.

Overview of Graphic Software

Graphic software refers to computer programs and applications that allow users to create, edit, and manipulate visual graphics such as drawings, diagrams, photographs, illustrations, animations, logos, fonts, layouts, and more. Graphic software provides tools to produce and alter digital images and designs.

Graphic authoring tools are features within graphic software that enable the creation and editing of visual graphics. Common graphic authoring tool categories include:

- **Drawing tools** - Lets you draw original illustrations, shapes, lines, and anything imaginable with virtual pens, pencils, and paintbrushes.
- **Image editing tools** - Allows you to modify existing digital photos and images by cropping, resizing, adjusting color, adding effects, and layering elements.
- **Typography tools** - Helps you to arrange and style text, fonts, sizes, and layouts of words and letters.
- **Compositing tools** - Enables you to be able to combine different visual pieces like shapes, images, graphics, and text together into one finished product.
- **Animation tools** - Provides you the ability to make graphics move, take action, and become interactive using frames, timelines, and coding.
- **Templates** - Premade graphic files and layouts you can customize yourself to kickstart projects.

In the next section, we will discuss some common tools that allow you to create or edit your own visuals and graphics.

Educational Applications

Graphic design software has a vast array of educational applications for enhancing student learning experiences. (One thing to note - with the integration of AI in most tools, each of these examples can be created with the assistance of AI. It just takes a bit of practice to master the prompts!) Following are some examples of how you might use some of these tools in your own teaching and learning:

- Design visually engaging study aids like diagrams, charts, posters, flashcards, and infographics to reinforce lessons. You can use visuals to help simplify complex informational topics.
- Create illustrated guides, manuals, and handouts to teach processes, procedures, timelines, cycles, and sequences using visual steps and graphics.
- Produce marketing and promotional materials for classrooms, schools, programs, and events using eye-catching graphic designs for websites, emails, brochures, flyers, and social media posts.
- Craft interactive digital lessons and learning activities with embedded imagery, graphics, and visual elements to help boost engagement and interest.
- Let students to make their own illustrations, artwork, designs, floor plans, prototypes, and 3D models to facilitate hands-on learning.
- Edit and enhance photos to use in lessons to provide real-world examples, showcase student work, document learning, and create customized avatars. [Note: if you are using other's photos, be sure that you are complying with copyright laws.]
- Make concept maps that organize and connect key vocabulary terms and ideas using lines, shapes, text, and visual cues for memory retention.
- Develop educational animations or videos incorporating graphics, text, narration, and visual effects to explain processes and procedures dynamically.

- Print classroom signage, bulletin boards, nameplates, labels, and decorations to motivate students and decorate spaces.
- Allow students to design avatars representing themselves, characters, or anything they imagine. Empowering your students to actively use graphic tools themselves promotes creativity, critical thinking, and visual literacy skills valuable for success in this digital age.

Benefits for Instruction

There are many benefits of using visuals and graphics to support teaching and learning! Some ideas to consider:

- **Boost engagement and comprehension:** High-quality visuals that boost student engagement and comprehension. Graphics are processed 60,000 times faster in the brain compared to text, allowing faster information processing and improved memory recall (Vanichvasin, 2020).
- **Simplify complex topics:** Enhance explanations and slide presentations with custom diagrams, info-graphics, illustrations, animations, concept maps, and other visual elements that represent relationships and clarify complex topics.
- **Reinforce learning:** Create visually appealing posters, signs, and displays around the classroom that reinforce learning through visual cues and celebration of student work.
- **Meet diverse learning needs:** Modify existing graphics found online to better suit educational needs. Customize visual content by adding or removing elements, changing colors, and integrating explanatory text.
- **Make abstract concepts more concrete:** Develop original visual analogies, models, and representations aligned with curriculum standards. Visuals make abstract concepts more concrete.

Keep it Relevant: Using pictures and graphs that relate to what students are learning can help them understand and remember better. When students see things shown visually along with the content, it causes their brains to process in a visual way. Seeing things helps the brain do things like notice patterns, understand what is seen, and handle information. For instance, a timeline that shows history events in order can help a student recall what happened and grasp how one event led to another over time. Pictures and visuals make the content more clear, easier to process, and stick in the brain better.

References

Vanichvasin, P. (2020). [Effects of visual communication on memory enhancement of Thai undergraduate students, Kasetsart University](#). *Higher Education Studies*, 11(1), 34.

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3.5: Creating Visual Content with Graphic Authoring Software

In the last section, we discussed the benefits of including visuals and graphics in your teaching and learning. In this section, we will briefly explore strategies, techniques, and some common tools for developing your own visual content.

Creating Engaging Visual Content

In today's highly visual digital world, creating engaging visual content is essential for connecting with modern learners and facilitating robust comprehension. Unfortunately, teaching materials often rely solely on non-engaging textual and verbal information. This can result in poor student outcomes like lack of motivation, struggling retention, and minimal participation.

For example, a lecture consisting of hours of static bullet points may quickly bore students. Presenting dense paragraphs of text on worksheets is cognitively taxing for learners to process. Walls of lecture notes filled with words but no graphics can be overwhelming. In contrast, using relevant images, illustrations, diagrams, infographics, and other visual elements can spark interest while easing your learner's cognitive load.

Visual content presented in colorful, graphically organized formats better engages students' attention and makes difficult concepts more accessible. Our brains decode visual input **exponentially faster than text**. Multimedia learning experiences that **strategically incorporate** interactive visuals, activities, and assessments are significantly more impactful than traditional mediums relying solely on written or spoken information (Vanichvasin, 2020).

Creating Visually Appealing Materials

Following basic graphic design principles creates more organized, pleasing layouts that effectively direct the viewer's attention. Begin with simplicity and purpose. Before even starting to design, understand what you want to accomplish. When designing educational visuals, utilize these graphic design strategies for maximum appeal and engagement:

- Prioritize the most important information using larger-size typography, contrasting colors, strategic placement, and visual emphasis. Help guide the viewer's attention.
- Align elements cleanly for visual cohesion. Use consistent margins, spacing between items, and alignment with edges or grid lines.
- Add white space between sections and around edges to reduce crowding. Leave breathing room around items.
- Choose complementary colors that reinforce relationships between elements. Use bright contrasting hues to highlight key areas.
- Establish visual hierarchy by varying fonts, sizes, colors, etc. to distinguish headings from body text. Make titles prominent.
- Organize with groups, columns, or sections to segment complex information into digestible chunks.
- Select clean, minimalist fonts that are easy to read. If you choose to use a decorative font support it with standard web-safe fonts.
- Limit decorations. Too many graphics or effects create visual clutter. Use selectively.
- Craft a consistent style through repeating design choices like colors, fonts, shapes, or graphic elements.
- Review the entire composition for balance, flow, and clear entry points for the viewer's gaze. Refine as needed.

References

Vanichvasin, P. (2020). [Effects of visual communication on memory enhancement of Thai undergraduate students, Kasetsart University](#). *Higher Education Studies*, 11(1), 34.

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3.6: Chapter Summary and Knowledge Check

Chapter 3 Wrap Up



This chapter explored the connection between the evolving landscape of software and apps and effective teaching and learning practices. It emphasized the exploration of apps and software tailored for specific subjects while ensuring alignment with curriculum needs. The focus extended beyond finding the right tools to understanding their pedagogical value, acknowledging the variability in digital tools. The chapter introduced evaluation tools to aid in discerning the effectiveness of apps and software in supporting teaching methodologies and best practices. Additionally, it explored graphic authoring and editing software to enhance lessons with visuals, aiming to equip educators to make informed decisions about technology integration for a dynamic and engaging learning experience.

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Check Yourself

Review the following questions to self-check your knowledge on the content in this chapter. The answers can be found at the bottom of this page.

Question 1: Which factor is crucial for evaluating the accessibility of educational software or apps, ensuring compliance with Section 508 guidelines?

A) Reviews and Ratings B) Content Relevance C) Accessibility (VPAT) D) Ease of Use

Question 2: What is a key consideration when integrating apps into the classroom, specifically in terms of ensuring proper alignment and effectiveness?

A) Random selection of apps without specific goals B) Monitoring progress through student app metrics C) Avoiding any traditional instruction in favor of app learning D) Using apps exclusively for skill reinforcement

Question 3: What is a strategy for aligning apps to curriculum goals when selecting educational apps for the classroom?

A) Choosing apps that are entirely unrelated to current curriculum standards B) Selecting apps with age-inappropriate challenges C) Reviewing analytics to assess if students are achieving curriculum goals D) Avoiding customization capabilities to maintain a standardized approach

Question 4: True or False - Analyzing the instructional design of an educational app involves reviewing if the app follows principles of effective instructional design, such as defining learning objectives, organizing content, providing practice, guiding feedback, and assessing comprehension.

Question 5: How can visuals and graphics contribute to teaching and learning by making abstract concepts more concrete?

A) By slowing down information processing B) By reducing engagement C) By simplifying complex topics D) By improving memory recall

Question 6: True or False - Selecting clean, minimalist fonts that are easy to read is a recommended graphic design strategy for creating visually appealing educational materials.

Answers: 1: C, 2: B, 3: C, 4: True, 5: C, 6: C

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CHAPTER OVERVIEW

4: Hardware and Devices in Education

Chapter Learning Outcome

- Integrate technology to create pedagogical change in teaching and learning

Introduction

In today's digital age, hardware and devices play a vital role in modern education, enhancing the learning experience and facilitating various educational activities. Tools have transformed how students learn and teachers teach, from personal computers and laptops to tablets, smartphones, interactive whiteboards, and specialized devices like VR headsets and 3D printers. Integrating devices into educational settings, schools and universities can create dynamic, interactive learning environments that cater to the diverse needs of students, promote collaboration, and prepare learners for the digital world. By integrating these hardware and devices into educational settings, schools and colleges can create dynamic, interactive learning environments that cater to the diverse needs of students. However, it is essential to ensure that educators receive proper training and support to use these tools effectively so students have equitable access to the necessary devices and resources. With the strategic implementation of hardware and devices, educational institutions can harness the power of technology to enhance student engagement, collaboration, and academic success.



- [4.1: Understanding Hardware and Device Functionality](#)
- [4.2: Effective Integration of Hardware and Devices in Instruction](#)
- [4.3: Adaptation and Innovation with Emerging Hardware and Devices](#)
- [4.4: Assistive Device Hardware](#)
- [4.5: Bring Your Own Device \(BYOD\) Policies- Balancing Flexibility and Security](#)
- [4.6: Chapter Summary and Knowledge Check](#)

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4.1: Understanding Hardware and Device Functionality

Section Learning Objectives

- Explore various hardware components and devices commonly used in educational settings, such as laptops, tablets, projectors, and interactive whiteboards.

In the world of computers, hardware is what makes everything work, allowing systems to perform different tasks. Understanding how hardware components and devices function is key for anyone interested in technology. This section provides you an overview of hardware components and how they work.

Hardware Components

Central Processing Unit (CPU): The CPU serves as the computer's brain, executing instructions and performing calculations. It consists of arithmetic logic units (ALUs) and control units responsible for managing data processing tasks. The clock speed and the number of cores determine the CPU's processing power, influencing the system's overall performance.

Random Access Memory (RAM): RAM is temporary storage for data and instructions the CPU needs to access quickly. It allows the system to multitask efficiently by temporarily holding active programs and data. RAM size and speed significantly impact the system's responsiveness and multitasking capabilities.

Hard Disk Drive (HDD) / Solid State Drive (SSD): Storage devices like HDDs and SSDs store permanent data on the computer. HDDs use spinning disks and read/write heads to store and retrieve data, while SSDs use flash memory for faster access. The choice between HDDs and SSDs depends on speed, reliability, and cost.

Graphics Processing Unit (GPU): The GPU specializes in rendering graphics and accelerating image processing tasks. It offloads graphical computations from the CPU, enhancing the performance of gaming, multimedia, and graphical applications. GPUs are integral components of modern computers, especially for tasks requiring intense graphical processing.

Motherboard: The motherboard acts as a communication hub, connecting various hardware components like the CPU, RAM, GPU, and storage devices. It provides interfaces and slots for attaching peripherals and expansion cards, facilitating data exchange between components.

Input and Output Devices: Input devices like keyboards, mice, and touchpads enable users to interact with the computer by providing input. Output devices such as monitors, printers, and speakers display information or output generated by the system. Understanding the functionalities of input and output devices is crucial for efficient computer usage.

Device Functionality

Drivers and Plug and Play (PnP) Technology: Drivers are software programs that enable the operating system to communicate with hardware devices. Plug and Play technology allows devices to be automatically detected and configured by the operating system, simplifying the installation process for users.

Device Manager and BIOS/UEFI: Device Manager in Windows provides a centralized interface for managing hardware devices, updating drivers, and troubleshooting issues. Basic Input/Output System (BIOS) or Unified Extensible Firmware Interface (UEFI) controls the boot process and hardware initialization, ensuring the system's proper functioning.

Troubleshooting Hardware Issues: Identifying and resolving hardware problems is essential for maintaining system performance and stability. Common hardware issues include faulty components, driver conflicts, and hardware compatibility issues. Troubleshooting involves diagnosing the problem, checking hardware connections, updating drivers, and seeking technical support.

Practical Applications

Understanding hardware functionality is crucial for various practical applications, including building and upgrading computers, troubleshooting hardware issues, and optimizing system performance. By applying the knowledge gained from this reading material, individuals can make informed decisions regarding hardware selection, installation, and maintenance.

Understanding hardware and device functionality is fundamental for anyone interested in technology and computing. By familiarizing themselves with hardware components, their tonalities, and practical applications, individuals can enhance their computer literacy and make informed decisions in the ever-evolving world of technology.

Reference

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4.2: Effective Integration of Hardware and Devices in Instruction

Section Learning Objectives

- Identify strategies for effective technology integration in the classroom.

Integrating Hardware and Devices

Integrating hardware and devices into classroom instruction has become essential for enhancing student engagement and learning outcomes. However, more than just having access to technology is required; educators must strategically incorporate these tools to maximize their potential. This section explores some best practices and strategies for effectively integrating hardware and devices into instruction.

1. Align technology with learning objectives:
 - Identify the specific learning objectives for each lesson
 - Select hardware and devices that support and enhance those objectives
 - Ensure that the chosen technology is age-appropriate and accessible to all students
2. Familiarize yourself with the hardware and devices:
 - Invest time in learning the features and capabilities of the technology
 - Explore potential applications and limitations of each device
 - Seek professional development opportunities to stay updated on the latest tools
3. Create engaging and interactive lessons:
 - Use hardware and devices to facilitate active learning experiences
 - Incorporate multimedia elements such as videos, animations, and simulations
 - Encourage student participation through interactive whiteboards, tablets, or response systems
4. Foster collaboration and communication:
 - Utilize collaborative platforms and tools to promote teamwork and idea-sharing
 - Leverage video conferencing and chat features to connect with experts or other classrooms
 - Encourage students to use devices for group projects and presentations
5. Provide clear guidelines and expectations:
 - Establish rules and protocols for responsible technology use in the classroom
 - Teach digital citizenship skills, including online safety and etiquette
 - Monitor student activity and provide guidance when necessary
6. Assess and adapt:
 - Regularly evaluate the effectiveness of the integrated technology
 - Gather feedback from students and colleagues to identify areas for improvement
 - Be willing to adapt and modify your approach based on the needs of your students



As you can see, integrating hardware and devices into instruction requires careful planning, training, and continuous evaluation. By matching technology with learning goals, creating interesting lessons, encouraging collaboration, and setting clear guidelines, educators can use these tools to improve student learning. Keep in mind that technology isn't a replacement for good teaching, but it can greatly support and enhance it.

Reflection Questions:

1. How can you assess the effectiveness of the hardware and devices you integrate into your lessons?
2. What strategies can you employ to ensure all students have equitable access to technology in your classroom?
3. How can you collaborate with colleagues to share best practices and innovative ideas for integrating technology into instruction?

References

Image created with Adobe Firefly: Students wearing VR headsets.

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4.3: Adaptation and Innovation with Emerging Hardware and Devices

Keeping Abreast of Emerging Hardware and Devices

Section Learning Objectives

- Instructors will explore innovative ways to incorporate emerging hardware and devices into their teaching practices

One of our recurring themes is that educators must stay informed as it relates to technology (it's number one on the list below!). In this section, we focus on emerging hardware and devices that can potentially transform teaching and learning. Adapting to these new tools and innovating instructional practices are crucial for preparing students for the future. This lesson will explore strategies for staying current with emerging technologies and leveraging them to enhance educational experiences.

Stay informed about emerging technologies:

- Follow educational technology blogs, podcasts, and social media accounts
- Attend conferences and workshops focused on innovative tools and practices
- Join professional learning communities to collaborate with like-minded educators

Evaluate the potential of new hardware and devices:

- Consider how emerging technologies align with your learning objectives
- Assess the user-friendliness and accessibility of new tools for your students
- Determine the cost-effectiveness and scalability of implementing new technologies

Pilot and experiment with emerging tools:

- Start small by introducing new hardware or devices in a controlled setting
- Gather feedback from students and colleagues during the pilot phase
- Iterate and refine your approach based on the results of your experiments

Redesign learning experiences:

- Explore how emerging technologies can facilitate personalized and adaptive learning
- Incorporate immersive technologies such as virtual and augmented reality to create engaging experiences
- Leverage artificial intelligence and machine learning to provide targeted support and feedback

Empower students as creators and innovators:

- Encourage students to use emerging tools to design and develop their projects
- Foster a culture of innovation and risk-taking in your classroom
- Celebrate student-led initiatives and showcase their creations to a broader audience

Collaborate and share best practices:

- Partner with colleagues to co-design lessons and projects that integrate emerging technologies
- Share your successes and challenges with the broader educational community
- Advocate for the adoption of promising tools and practices at your school or district level

Adapting to and using new hardware and devices is an ongoing process that requires curiosity, flexibility, and a willingness to learn. By staying updated, exploring new tools, trying them out in the classroom, and working with others, educators can use new technologies to create powerful learning experiences.

Reflection Questions

1. What emerging hardware or devices have captured your attention recently, and how might they be applied in your educational context?



2. How can you foster a culture of innovation and risk-taking among your students and colleagues?
3. What steps can you take to ensure that the integrating technologies in your classroom are able and inclusive for all learners?

References

Image created with Adobe Firefly: Emerging technology

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- Explore assistive device hardware in teaching and learning.

Assistive device hardware helps individuals with disabilities to lead more independent and fulfilling lives. These devices help people with various challenges to overcome barriers and engage more fully in educational, professional, and social activities. This section will explore the different types of assistive device (as it pertains to technology) hardware and their impact on improving accessibility and quality of life.



- Augmentative and Alternative Communication (AAC) devices: Tools that help individuals with speech or language impairments express themselves
- Speech-generating devices: Electronic devices that produce spoken language based on user input
- Picture communication systems: Devices that use images or symbols to facilitate communication
- Text-to-speech software: Programs that convert written text into spoken words

- Hearing aids: Devices that amplify sound for individuals with hearing impairments
- Cochlear implants: Surgically implanted devices that bypass damaged parts of the ear to provide sound signals to the brain
- Assistive listening devices: Systems that enhance sound clarity and reduce background noise
- Braille devices: Tools that convert text into tactile Braille characters for individuals with visual impairments

- Memory aids: Devices that provide reminders and prompts for tasks, appointments, or medication
- Time management tools: Hardware that helps individuals organize and manage their daily schedule
- Attention-assistive devices: Tools that help individuals maintain focus and concentration
- Wearable technology: Devices that monitor and provide feedback on cognitive functions, such as sleep patterns or stress levels

- Conduct assessments: Evaluate the specific needs and preferences of each individual to determine appropriate assistive devices
- Provide training and support: Offer ongoing guidance and resources to ensure effective use of assistive devices
- Collaborate with professionals: Work with healthcare providers, therapists, and technicians to optimize assistive device selection and implementation
- Advocate for accessibility: Promote policies and practices that support the widespread availability and affordability of assistive technologies

1. How can you raise awareness about the importance of assistive device hardware in your community?
2. What barriers might individuals with disabilities face when accessing or utilizing assistive devices, and how can these barriers be addressed?
3. In what ways can assistive device hardware be integrated into educational settings to support students with disabilities and promote inclusive learning environments?

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4.5: Bring Your Own Device (BYOD) Policies- Balancing Flexibility and Security

Learning Objectives

- Explore Bring Your Own Device (BYOD) in education

Implementing a Bring Your Own Device (BYOD) Policy

Bring Your Own Device (BYOD) policies have gained significant traction recently as organizations seek to provide students with greater flexibility and choice in their work tools. BYOD allows individuals to use their devices, such as smartphones, tablets, or laptops, for work-related tasks. While this approach offers several benefits, it also challenges security, compatibility, and management. This section will explore the key considerations and best practices for implementing effective BYOD policies. For instance, smartphones have become ubiquitous for students of all ages. Is that an opportunity or a challenge? It may depend on your BYOD policy.

1. Benefits of BYOD:

- **Increased productivity:** Employees can work on devices they are comfortable with, leading to improved efficiency
- **Cost savings:** Organizations can reduce hardware and software expenses by leveraging student-owned devices
- **Enhanced mobility:** BYOD enables remote work and access to educational resources from anywhere
- **Student satisfaction:** Allowing personal device usage can boost morale and satisfaction

2. Security Concerns and Mitigation Strategies:

- **Data protection:** Implement strong encryption, secure authentication, and remote wipe capabilities to safeguard sensitive information
- **Network security:** Establish secure Wi-Fi networks, virtual private networks (VPNs), and firewalls to prevent unauthorized access
- **Malware prevention:** Deploy mobile device management (MDM) solutions to monitor and protect against malware threats
- **Student education:** Provide training on security best practices, such as strong passwords, software updates, and phishing awareness

3. Compatibility and Support:

- **Device diversity:** Ensure that business applications and resources are compatible with a wide range of devices and operating systems
- **IT support:** Establish clear guidelines for device support, including troubleshooting, repairs, and replacements
- **Application management:** Implement a centralized application management system to distribute and update business apps on employee devices
- **Standardization:** Define minimum hardware and software requirements to ensure a consistent user experience.

4. Policy Development and Communication:

- **Acceptable use policy:** Clearly outline the rules and expectations for personal device usage in the workplace
- **Privacy considerations:** Address concerns related to personal data, monitoring, and remote access to employee devices
- **Ownership and liability:** Clarify policies regarding device ownership, repair responsibilities, and data ownership upon employee separation
- **Student acknowledgment:** Require students/parents to acknowledge and agree to the BYOD policy formally

5. Monitoring and Enforcement:

- **Usage monitoring:** Implement tools to track and monitor device usage to ensure compliance with BYOD policies
- **Incident response:** Establish procedures for handling security breaches, lost or stolen devices, and policy violations
- **Regular audits:** Conduct periodic assessments to identify potential risks and areas for improvement



- **Consequences for non-compliance:** Define and enforce consequences for students who violate BYOD policies

Reflection Questions

1. How can organizations effectively communicate BYOD policies to employees and ensure their understanding and compliance?
2. What challenges might arise when implementing BYOD policies in organizations with diverse student circumstances and varying levels of technical proficiency?
3. How can organizations stay ahead of evolving security threats and adapt their BYOD policies to mitigate emerging risks?

References

Image created using Adobe Firefly: Laptops, cell phones, tablets.

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4.6: Chapter Summary and Knowledge Check

Chapter 4 Wrap Up



This chapter explored the connection between the evolving landscape of software and apps and effective teaching and learning practices. It emphasized the exploration of apps and software tailored for specific subjects while ensuring alignment with curriculum needs. The focus extended beyond finding the right tools to understanding their pedagogical value, acknowledging the variability in digital tools. The chapter introduced evaluation tools to aid in discerning the effectiveness of apps and software in supporting teaching methodologies and best practices. Additionally, it explored graphic authoring and editing software to enhance lessons with visuals, aiming to equip educators to make informed decisions about technology integration for a dynamic and engaging learning experience.

Check Yourself

Review the following questions to self-check your knowledge on the content in this chapter. The answers can be found at the bottom of this page.

Question 1: Which component serves as the computer's brain, executing instructions and performing calculations?

A) Random Access Memory (RAM) B) Graphics Processing Unit (GPU) C) Central Processing Unit (CPU) D) Hard Disk Drive (HDD) / Solid State Drive (SSD)

Question 2: What type of devices store permanent data on the computer, with HDDs using spinning disks and SSDs using flash memory for faster access?

A) Random Access Memory (RAM) B) Graphics Processing Unit (GPU) C) Central Processing Unit (CPU) D) Hard Disk Drive (HDD) / Solid State Drive (SSD)

Question 3: Which hardware component specializes in rendering graphics and accelerating image processing tasks, enhancing the performance of gaming and multimedia applications?

A) Random Access Memory (RAM) B) Graphics Processing Unit (GPU) C) Central Processing Unit (CPU) D) Motherboard

Question 4: True or False - Speech-generating devices support individuals with speech or language impairments by helping them express themselves, often using symbols or pictures?

Question 5: What key consideration should organizations address regarding device ownership, repair responsibilities, and data ownership upon employee separation when implementing a BYOD policy?

A) Acceptable Use Policy B) Compatibility and Support C) Privacy Considerations D) Ownership and Liability

Answers: 1: C, 2: D, 3: B, 4: True, 5: D

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CHAPTER OVERVIEW

5: Technology, Media, and Curriculum Integration

Chapter Learning Outcomes

- Identify the difference between media and technologies in educational contexts.
- Integrate different media and technologies into the curriculum, including new and emerging technologies, within an analytical framework.



In this chapter, you will explore important concepts that have and continue to shape the landscape of education. In this chapter, we will discuss curriculum standards, benchmarks, and the integration of technology in teaching and learning. We'll begin by addressing the significance of curriculum standards and benchmarks, and how they relate to technology integration. Throughout our exploration, we'll address challenges and offer insights into effective planning for technology integration in education.

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[5.1: Understanding Curriculum Standards and Learning Benchmarks](#)

[5.2: Technology and Curriculum Integration](#)

[5.3: The Influence of Technology on Learning](#)

[5.4: Planning for Technology Integration](#)

[5.4.1: Planning for Technology Integration, cont.](#)

[5.5: Planning Tools and Instructional Models for Technology Integration](#)

[5.5.1: Instructional Models](#)

[5.6: Chapter Summary and Knowledge Check](#)

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5.1: Understanding Curriculum Standards and Learning Benchmarks

Section Learning Objectives

- Define curriculum standards and their role in education.
- Explain the significance of learning benchmarks in curriculum design.
- Identify how curriculum standards and benchmarks guide instructional planning.

Before we delve into integrating technology into curriculum, let's take a few moments to discuss some basics of education: curriculum standards and their impact on education, curriculum design, and instructional planning.

What are curriculum standards?

Curriculum standards are guidelines for what students should know and be able to do at each grade level. They outline the major learning goals and academic content in core subject areas like math, science, English language arts, and social studies. Curriculum standards are decided at the state level by each state's Department of Education. So each state sets standards that apply to all public schools in that state. The goal of standards is to ensure students across a state learn the same key knowledge and skills for their grade level and subject area. This promotes consistency and fairness in education across different schools and districts.

For example, a common 4th-grade math curriculum standard is that students can use the four operations (addition, subtraction, multiplication, and division) to solve word problems involving multi-digit whole numbers. A 9th-grade science standard may be that students understand the structure of atoms, including the nucleus, protons, neutrons, and electrons. An 11th-grade English standard could be that students can analyze an author's perspective and purpose when reading informational texts.

Curriculum standards are broader goals that frame what content teachers should cover. They aim to guide the key knowledge and abilities students need to develop at each grade level. Standards provide a roadmap for teaching major subjects from kindergarten through high school. Following state curriculum standards helps ensure students get a comprehensive education as they advance each year.

Do you know where to find the standards that align with the grade level and topic that you are teaching or that you plan to teach? If not, this would be a great time to take a break and do a bit of research! Following are a few resources as a place to start:

- **Common Core State Standards Initiative:** This is a state-led effort coordinated by the National Governors Association Center for Best Practices (NGA Center) and the [Council of Chief State School Officers\(opens in new window\)](#) (CCSSO). These standards define the knowledge and skills students should have within their K-12 education careers so that they will graduate high school able to succeed in entry-level, credit-bearing academic college courses and in workforce training programs.
- **NAfME Standards:** The [National Association for Music Education \(opens in new window\)](#)(NAfME) provides national standards for music education.
- **State Standards** Here is a link to some [state standard resources provided by Education World\(opens in new window\)](#):

What are learning benchmarks?

Learning benchmarks break down the broader curriculum standards into smaller, more specific skills and knowledge students need to master. Benchmarks describe incremental steps students should achieve on the path toward meeting a standard by the end of the school year.

For example, common core math standards state students should be able to add and subtract multi-digit whole numbers by 4th grade. Benchmark skills leading to this standard could include:

- 3rd grade: Add and subtract 2-digit numbers without regrouping
- 3rd grade: Understand place value for numbers up to 1000
- 4th grade: Add and subtract 2-digit numbers with regrouping
- 4th grade: Explain how to regroup when adding and subtracting 3-digit numbers

For a 9th grade physics standard about gravity, benchmarks may include:

- Calculate the gravitational force between two objects

- Explain gravitational acceleration on Earth
- Describe how mass affects gravitational force

Benchmarks break learning down into manageable sub-skills. They help teachers assess student progress throughout the year. Students can also track benchmarks to see their own growth in reaching standards. Benchmarks allow teaching and learning to be targeted to develop each key skill building up to the curriculum standard.

Why are standards and benchmarks useful?

Curriculum standards and benchmarks are an important foundation of education. Here are some key benefits:

- **They ensure consistency across schools** - Students receive comprehensive education based on the same grade-level goals regardless of their school or district within a state.
- **They provide teaching guidance** - Standards give teachers an outline of the essential content and skills to cover. Benchmarks help guide instructional planning and lessons.
- **They allow parent involvement** - Standards help parents understand what children should be learning and where their child is excelling or needs more support.
- **They enable student growth** - Benchmarks allow students to set goals and reflect on their own learning progress.
- **They promote accountability** - Standards are used in student assessments and help evaluate the quality of education.

In the next section, we will begin to discuss the importance of aligning the integration of technology into your teaching and learning to the standards.

References

[Common Core Standards](#). (2021) Common Core State Standards Initiative.

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5.2: Technology and Curriculum Integration

Section Learning Objectives

- Define technology integration and its relationship to curriculum design.
- Explore the benefits and challenges of integrating technology into the curriculum.

In the last section, we discussed some basics about education standards. Let's move to talking about the importance of aligning the standards to the technology you choose to integrate into your teaching and learning.

What is technology integration (curriculum integration)?

Technology integration means incorporating the use of technology tools and applications as part of classroom teaching and learning activities. For example, students may use laptops or tablets to access online learning games, interactive simulations, digital research sources, and multimedia creation software. Or teachers may have students work collaboratively using cloud-based productivity tools like shared online documents and presentation slide decks. The goal is to use technology as an integrated part of achieving curriculum goals and enhancing understanding of academic concepts and skills. **Successful technology integration aligns the use of technology tools with curriculum goals and standards.** (Ottenbreit-Leftwich et. al., n.d)

Even though the following 5 minute video from Edutopia is a few years old, the concepts are current and relevant!



An Introduction to Technology (2012) Edutopia [Video: 4:51 minutes. Closed Captioned]

How does it relate to curriculum design?

Curriculum design is the process of planning lessons, instructional strategies, content, learning activities, and assessments to meet educational standards and goals. Technology integration involves purposefully incorporating technology into this instructional planning process. Teachers design the curriculum first based on learning objectives, then determine where and how classroom technology use can support and strengthen teaching and learning.

For instance, if the curriculum goal is for students to understand photosynthesis, the teacher may plan to have students watch an animation showing how the photosynthesis process works, and then allow them to experiment with an interactive photosynthesis simulation. **The technology is thoughtfully built into the curriculum unit design, rather than added on separately.**

Understanding curriculum standards and learning benchmarks is important when integrating technology into the curriculum for a few key reasons (Johnson, et. al.)

- **Alignment with Standards**
 - Technology integration should directly connect to and support the key knowledge and skills outlined in curriculum standards and benchmarks. Teachers need to strategically align technology use with standards rather than using it arbitrarily. For example, if a 6th-grade social studies standard covers analyzing the geography and culture of ancient civilizations, technology activities could have students use interactive maps and digital museum tours related to the unit's ancient societies. Another example might be in an accounting course, business simulation software can support learning objectives related to financial statement preparation and analysis. Using this technology aligns directly with defined course and major goals. The technology directly reinforces the content and abilities within the standard. Without alignment, technology may seem disconnected or like extra work that detracts from core learning goals.
- **Guiding Effective Use**
 - Standards provide a guide for teachers on how technology can be used in meaningful ways to enhance specific skills. For instance, a 9th-grade physics standard may involve calculating forces. The teacher can use simulation software and digital measurement tools to give students opportunities to practice gathering, visualizing, and analyzing force data. The standard indicates how technology can improve understanding of concepts and abilities. Or perhaps a computer science course that aims to teach students Python programming. Standards would guide the instructor to have students use Python IDEs and applications to actively practice coding skills. This engages them in the target knowledge rather than passively listening to lectures. Standards can help to prevent technology use that is not purposeful.
- **Enabling New Ways of Teaching and Learning**
 - Technology can allow new, more engaging ways of developing the knowledge and abilities outlined in standards and benchmarks. For example, interactive simulations in science and math, online reading comprehension exercises, or virtual field trips in social studies. Another example might be in an engineering course, students could use 3D design software to prototype solutions for a project aligned to program outcomes. Or education majors could record practice teaching sessions to review and self-assess their instructional skills based on teaching standards. Technology integration should take advantage of these opportunities.
- **Supporting All Learners**
 - As an educator, you are teaching to diverse learners. All students do not learn in the same way! Technology can help differentiate instruction to ensure all students, including those with special needs, can access and engage with grade-level standards. For example, providing transcripts or captions for videos, text-to-speech for reading materials, and screen reader compatibility allows equal participation for students with disabilities. Understanding the benchmarks helps teachers identify where technology can help to support ALL students at different levels.
- **Informing Development of Digital Content**
 - Perhaps you are not an educator, but in a career or position that is working with or related to education. You should still have a solid understanding of the standards. For example, software developers, curriculum writers, and instructional designers should ground educational technology products, learning assets, and content in standards and benchmarks. This ensures that the digital tools will help students learn this critical knowledge and meet education goals. Content in digital tools and platforms should be designed to build the critical knowledge and skills students need. Understanding typical benchmarks can help developers incorporate the right scaffolding, interactivity, and assessment into digital learning. Technology that complements standards and how students learn best provides the most benefit.

What are some of the challenges?

While technology integration offers many advantages, potential challenges include:

- **Training time:** Requires extra time for educators to learn new technology tools and redesign lesson plans and activities to incorporate technology appropriately. Effective integration may require additional educator training and support in best practices for curriculum-aligned technology integration that enhances the achievement of learning goals. For example, a teacher may need training on how to use a new 3D design app before integrating it into their engineering curriculum unit.
- **Possible Mismanagement:** Can become distracting or overwhelming for students if too many apps or tools are introduced without a clear educational purpose. For example, students playing around with fun new presentation software animations may

lose focus on the content goals of their assignment.

- **Equity:** Depends on having reliable access to sufficient educational technology resources such as laptop carts, computer labs, high-speed internet, and digital curricular content. For example, a school may not have enough iPads for each student to use the new science simulation app installed on them. Homework assigned that requires an app and the internet will be challenging for those students who may not have access to it at home. Equity of access is vital.
- **Effective Selection:** Must be developmentally appropriate and fit curriculum standards and objectives. Entertainment-focused technology may not always provide an educational value. For example, letting young students play arcade-style math games may seem engaging but may not teach aligned concepts and skills.

However, with proven frameworks and strategies to overcome these challenges, technology integration can positively impact student achievement. Later in this chapter, we will discuss effective frameworks and strategies in the selection of technology in teaching and learning.

References

- Edutopia. (2012). *An Introduction to Technology Integration*. YouTube. Retrieved from https://youtu.be/d59eG1_Tt-Q?si=tMuUEl6YE-gmK-al.
- Johnson, A. M., Jacovina, M. E., Russell, D. E., & Soto, C. M. (2016). [Challenges and solutions when using technologies in the classroom](#). In S. A. Crossley & D. S. McNamara (Eds.) *Adaptive educational technologies for literacy instruction* (pp. 13-29). New York: Taylor & Francis
- Ottenbreit-Leftwich, Kimmons, Ottenbreit-Leftwich, A., & Kimmons, R. (n.d.). *Ottenbreit-Leftwich, A. [The K-12 Educational Technology Handbook](#)*.

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5.3: The Influence of Technology on Learning

Section Learning Objectives

- Identify ways in which technology positively influences learning outcomes.
- Explore research and evidence supporting the impact of technology on student engagement, motivation, and achievement.
- Explore specific examples and case studies showcasing successful technology integration in educational settings.

Technology's Power to Enhance Learning

Walk into many classrooms today and you'll see students captivated by learning games on their classroom tablets, collaborating on projects using online whiteboards, or embarking on virtual field trips with VR headsets. While technology has often entered schools with more hype than proven results, research makes clear it holds enormous potential to positively influence learning when thoughtfully implemented.

Let's explore some of the key benefits technology can offer and see real-world examples of it enhancing engagement, comprehension, and achievement. Some benefits:

- **Increased Engagement and Interest:** Educational games, simulations, and multimedia creation activities are more engaging than traditional textbooks and lectures. They motivate students by involving them in problem-solving and creative tasks, leading to better understanding and retention.
- **Improved Motivation and Attitude:** Using technology like tablets and interactive whiteboards in classrooms enhances student enthusiasm and attitudes towards learning. These high-tech tools, familiar from their use in entertainment, make education more enjoyable and relevant.
- **Deeper Understanding and Retention:** Interactive tools such as videos, animations, 3D models, and virtual reality help students visualize and interact with complex concepts, leading to better comprehension and memory retention.
- **Accommodate Different Learning Styles:** Technology supports diverse learning styles by offering varied tools like videos for visual learners, text-to-speech for auditory learners, and interactive projects for tactile learners, enabling personalized instruction for different needs and preferences.
- **Develop 21st-century skills:** Using technology in the classroom provides students with opportunities to build vital skills needed to succeed in today's world and in future careers. These include:
 - *Digital Literacy* - Using computers, mobile devices, apps, and online platforms teaches students the technological fluency required in higher education and the modern workplace. From word processing to spreadsheets to creating multimedia, technology boosts essential digital skills.
 - *Creativity & Innovation* - Designing projects and products using digital tools allows students to think creatively and problem-solve. Tools like graphic design, video editing, animation, and programming enable students to be innovative and express themselves.
 - *Critical Thinking* - Educational software and games that require analyzing data, seeking solutions, and making decisions promote critical thinking abilities. Virtual simulations also encourage experimenting, iterative problem-solving, and causal reasoning.
 - *Communication & Collaboration* - Online tools provide venues for students to practice professional communication skills and teamwork. Writing emails, sharing workspaces, video conferencing, and participating in discussion boards - technology facilitates group work and peer learning.
 - *Information Literacy* - The internet and digital databases offer access to limitless information. Using these resources in projects teaches research skills and discerning reliable sources. Technology enables locating, evaluating, and synthesizing information efficiently. (Almazroa & Alotaibi, 2023)

Watch this 9 minute Ted Talk which explores and explains more benefits of technology integration in education.



The Benefits of Technology in Education (Uyen Nguyen Thuc). TedxTalks. [Video: 9:16. Closed Captioned]

Many studies have shown interactive digital learning tools grab and hold a student's attention better than traditional static textbooks and lectures. Educational games and simulations get students actively solving, exploring, and experimenting. This immersive involvement increases time spent learning critical concepts. A study published in the National Center for Biotechnology Information (NCBI) found that mobile-assisted seamless learning environments had positive effects on students' success and motivation in a secondary school 7th-grade mathematics class algebra unit. (Pocan, et. al., 2023)

Beyond engagement, technology tools like video clips, 3D models, and science simulations help students deeply comprehend complex or abstract ideas they struggle to understand from traditional instruction alone. Visualizing and interacting makes challenging topics more concrete. Students also remember concepts better when they are active participants rather than passive listeners. A study published by eLearning Industry in June 2023 found that the use of technology in education can lead to increased knowledge retention and the development of critical thinking skills. The study highlights that technology can make the learning process more enjoyable and engaging, leading to better outcomes for students.(Joshi, 2023).

Real schools showcase impressive success stories. A systematic review by NCBI (2022) found that technology use can have a positive impact on cognitive development, particularly in areas such as language and literacy, when used appropriately. (Ricci, et. al, 2022)

The key is not just having flashy gadgets, but integrating them thoughtfully based on curriculum goals. Do this, and technology can amplify student learning and development in powerful ways. While technology is not a "magic wand" solution, but when it is well-designed, thoughtfully planned, and implemented well, it supports the teaching and learning expertise of the instructor and enhances knowledge retention for the learner.

References

- Almazroa, H., & Alotaibi, W. (2023). [Teaching 21st Century Skills: Understanding the Depth and Width of the Challenges to Shape Proactive Teacher Education Programmes](https://doi.org/10.3390/su15097365). *Sustainability*, 15(9), 7365. MDPI AG. Retrieved from <http://dx.doi.org/10.3390/su15097365>
- Joshi, S. (2023, June 21). [The role of technology in education, post pandemic](https://www.elearningindustry.com/the-role-of-technology-in-education-post-pandemic). eLearning Industry.
- Počan S, Altay B, Yaşaroğlu C. The Effects of Mobile Technology on Learning Performance and Motivation in Mathematics Education. *Educ Inf Technol (Dordr)*. 2023;28(1):683-712. doi: 10.1007/s10639-022-11166-6. Epub 2022 Jul 5. PMID: 35814805; PMCID: PMC9253263.

Ricci RC, Paulo ASC, Freitas AKPB, Ribeiro IC, Pires LSA, Facina MEL, Cabral MB, Parduci NV, Spegiorin RC, Bogado SSG, Chociay Junior S, Carachesti TN, Larroque MM. Impacts of technology on children's health: a systematic review. Rev Paul Pediatr. 2022 Jul 6;41:e2020504. doi: 10.1590/1984-0462/2023/41/2020504. PMID: 35830157; PMCID: PMC9273128.

Uyen Nguyen Thuc (2023). *The Benefits of Technology in Education* . TedxTalks. *YouTube*.

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5.4: Planning for Technology Integration

Section Learning Objectives

- Discuss strategies for planning and incorporating technology into curriculum design.
- Identify factors such as available resources, infrastructure, and professional development needs.

Planning for Technology Integration

In this section, we will dig deeper into important aspects of planning for technology integration in teaching and learning. Planning for technology integration is important to you, whether you are an educator, a curriculum designer, or simply someone interested in understanding how technology can be effectively integrated into education. In this section, we will look at four topics to consider: Aligning with learning objectives, identifying a pedagogical approach, a focus on student centered learning, and accessibility (Schmidt, et. al, 2023).



Align with Learning Objectives

When planning a lesson or unit, it's crucial to start by clearly outlining the specific learning objectives, knowledge, and skills you aim for your students to develop. These should align with academic standards and course goals, identifying key concepts, processes, and abilities. An essential next step is considering how the integration of classroom technology can support these learning objectives, enhancing the overall learning experience.

For instance, let's consider a science unit on plant growth. The primary goal is for students to understand the key stages of the plant life cycle. Here, technology integration can be transformative. Time-lapse video clips can visually illustrate the growth process, while interactive diagrams and simulations bring abstract concepts to life. Digital field trips offer a virtual hands-on experience, and a digital journaling app enables students to document and reflect on plant growth firsthand. In this scenario, technology isn't just an add-on; it's a vital tool that enriches the curriculum goal.

Pedagogical Approach

What do we mean by pedagogical approach? A pedagogical approach is a method and practice of teaching that includes the strategies and techniques used by educators to facilitate learning. When integrating any technological tool, the primary focus should be on how it offers meaningful improvements over traditional instruction. This includes evaluating its capacity for better visualization, immersion, customized feedback, applied practice, or greater accessibility. Here are some examples in how to address those issues in your pedagogical approach.

Consider 4th graders learning about early European exploration of North America. Using digital mapping software, they can interactively explore key geographical concepts. This approach is not only more engaging than a traditional textbook lesson but also helps students visualize historical routes and landscapes, making the learning experience more concrete and memorable.

In a high school or college accounting course, the integration of technology can transform abstract concepts into tangible skills. For example, students can analyze real company financial statements imported into spreadsheet software. This method offers an authentic data analysis experience that goes beyond the capabilities of textbook examples, providing a practical application of theoretical knowledge.

Student-Centered Learning

What is meant by student-centered learning? It is a teaching method where the focus is on the students' needs and interests, encouraging them to actively participate and collaborate in their own learning. To encourage active participation and collaboration among students, there are many technology tools that can be used. Online discussion forums, collaborative document editing, and virtual group projects are not just innovative tools; they are ways to help foster deeper student engagement and peer-to-peer learning.

For instance, online discussion forums can be a platform for students to explore and debate course topics outside the traditional classroom setting. This not only provides opportunities for critical thinking but also allows quieter students to express their ideas more comfortably. In a science class, students could collaboratively edit a document to compile research findings, encouraging teamwork and the synthesis of collective knowledge. Virtual group projects, especially in a globalized classroom, can bring diverse perspectives together, teaching students valuable lessons in cross-cultural communication and cooperation. These projects can culminate in virtual presentations, allowing students to develop not only their understanding of the subject matter but also their digital communication skills.

Accessibility

When selecting technology for educational purposes, it's essential to ensure that it is accessible to all students, including those with disabilities. This might mean choosing software with built-in accessibility features or providing alternative resources to accommodate diverse learning needs. A key resource in this process is the [Voluntary Product Accessibility Template \(VPAT\)](#).

A VPAT is a tool used to assess how a product aligns with accessibility standards like the Americans with Disabilities Act (ADA) or the Web Content Accessibility Guidelines (WCAG). It provides detailed information about a product's accessibility, outlining how it supports assistive technologies such as screen readers, keyboard navigation, and other tools vital for individuals with disabilities to access digital content. Think of a VPAT as a report card that grades a technology product on its accessibility features. It's a straightforward way for schools and organizations to gauge whether a technology product meets the diverse needs of their students, including those with disabilities.

Accessibility should be a primary consideration in technology selection in education. The VPAT is a valuable tool in this process, helping to identify technologies that are not just powerful and innovative but also inclusive and accessible to all students. By emphasizing the importance of accessibility and utilizing resources like the VPAT, educational institutions can make informed decisions that benefit every student.

References

Schmitz, M.-L., Antonietti, C., Consoli, T., Cattaneo, A., Gonon, P., & Petko, D. (2023). [Transformational Leadership for Technology Integration in schools: Empowering teachers to use technology in a more demanding way](#). *Computers & Education*, 204, 104880.

[Voluntary Product Accessibility Template](#). US Government, General Services Administration.

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5.4.1: Planning for Technology Integration, cont.

Resources and Infrastructure

Now that we've looked at some strategies, let's discuss the factors that need to be considered during the planning process:

Available Resources: Evaluate the technology resources at your disposal. Take an inventory of the technology resources readily available, such as computer lab spaces, laptops or tablets on carts, software licenses, classroom projection equipment, craft and design materials, and even support staff. Consider if adding new tools is feasible. This helps determine what technology integrations are realistic for lessons and what may not. For instance, if you have limited access to devices, you may need to schedule technology-based activities to ensure equitable access for all students.

Infrastructure: Assess the technological infrastructure of your educational institution. Is the network robust enough to support simultaneous online activities for all students? Are there any technical limitations that might affect your plans? Understanding your infrastructure will help you make informed decisions about the type and scale of technology integration.

Professional Development Needs

It is important to recognize that both educators and students may require training to effectively use technology. Successfully integrating technology relies heavily on educators having sufficient training and professional development. Teachers need time and support to learn new tools and design lessons integrating them appropriately, so this needs to be built into integration plans. The idea is to anticipate and adequately provide the required training and support for those using the technology to be able to use and integrate it effectively.

How do you do this? Identify the professional development needs of your teaching staff, and plan accordingly. For instance, a preschool adopting new educational tablets and apps may need to provide teachers with hands-on workshops on the developmentally appropriate use of these tools. Preschool teachers would need guidance on setting up activities, co-playing apps with students, modeling safe device handling, and using the technology to reinforce early literacy, math, and social-emotional skills. Observations and coaching would help ensure they can properly facilitate the new tech activities. Or maybe a college faculty may need workshops on effectively incorporating active learning platforms and apps into large lecture courses to meet pedagogical goals.

In this TedTalk, Deborah Nas discusses some of the challenges and issues that we also must consider in our technology integration planning.



Will technology shape our future or will we?. TedTalk. [Video: 13:35. Closed Captioned]

Reference

Nas, D (2023). *Will technology shape our future or will we?* TedxTalks. YouTube.

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5.5: Planning Tools and Instructional Models for Technology Integration

Section Learning Objectives

- Explore planning tools and frameworks for technology integration (e.g., RAT, TPACK, SAMR).
- Explore instructional models and strategies that incorporate technology effectively (e.g., blended learning, flipped classroom).

In this section, we'll explore some essential planning tools and instructional models that can help educators effectively integrate technology into their teaching practices.

Planning Tools for Technology Integration

When it comes to incorporating technology into your teaching, it's essential to have the right planning tools at your disposal. Let's take a closer look at some valuable frameworks:

RAT Model (Replacement, Amplification, Transformation)

In the realm of technology integration, the RAT model provides educators with a valuable framework for evaluating how technology is integrated into their teaching practices. RAT stands for Replacement, Amplification, and Transformation, and each of these stages represents a different level of technology integration.

The RAT model helps you assess how technology is used in your lessons. It offers three levels of integration:

- **Replacement:** Technology substitutes traditional methods without significant change. For example, using a word processor instead of a paper and pencil for writing assignments. In the RAT model's Replacement level, technology simply replaces old methods without changing how teaching and learning happen. For example, students might use word processing software like Microsoft Word instead of writing by hand, which makes writing easier but doesn't change the way they learn.
- **Amplification:** Technology enhances the learning experience but doesn't fundamentally change it. This might involve using educational apps to reinforce math concepts. At the Amplification stage, technology enhances education, making it more efficient. Teachers might use educational apps in their lessons for extra practice or to explain concepts. These apps, like one offering interactive math problems, help students by giving instant feedback and allowing them to learn at their own pace.
- **Transformation:** Technology completely transforms the learning process, enabling new ways of teaching and learning. For instance, virtual reality simulations that immerse students in historical events. At the Transformation level, the highest in the RAT model, technology completely changes teaching and learning. It allows for new, creative ways to teach. For example, in a history class, students might use virtual reality to experience historical events, making history more engaging and memorable. This use of technology is a big shift from traditional teaching methods.

Watch this short video on the RAT Model to learn more.



The RAT Model. [Video: 2:02 minutes. Closed Captioned.]

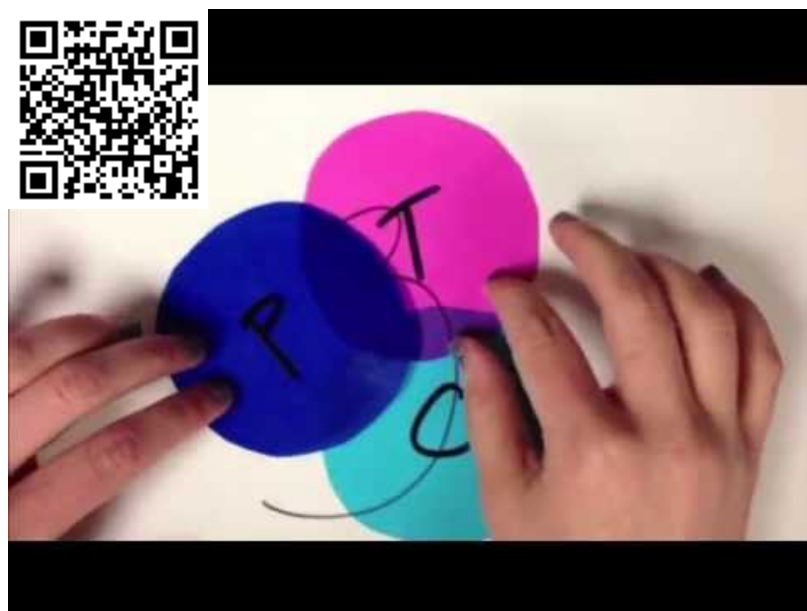
TPACK Framework (Technological Pedagogical Content Knowledge)

The TPACK (Technological Pedagogical Content Knowledge) model is a framework that helps teachers integrate technology into their instruction by considering the intersection of three types of knowledge: content knowledge, pedagogical knowledge, and technological knowledge. The TPACK model encourages teachers to think about how technology can be used to enhance their teaching and improve student learning. The TPACK framework helps educators find the sweet spot where these three knowledge domains overlap, leading to effective technology integration.

TPACK considers the intersection of three crucial types of knowledge:

- **Technological Knowledge:** Understanding how to use technology effectively.
- **Pedagogical Knowledge:** Knowing how to teach in a way that engages students.
- **Content Knowledge:** Mastery of the subject matter you're teaching.

Watch this 2 minute video on TPACK:



TPACK in 2 minutes. [Video: 1:58 minutes. Closed Captioned.]

- **Technological Knowledge:** This involves understanding and effectively using technology. It includes proficiency in digital tools and adapting to new technologies. In TPACK, educators need to be comfortable with software and hardware relevant to their field. For example, a biology teacher might need to use data analysis software for environmental studies.
- **Pedagogical Knowledge:** This is about effective teaching methods, including educational theories, teaching strategies, and classroom management. In TPACK, it's about using these methods alongside technology to meet learning objectives. For instance, a history teacher might use online forums for engaging students in historical debates.
- **Content Knowledge:** This is about having a deep understanding of the subject matter. In the TPACK framework, educators need extensive knowledge in their subject to effectively integrate technology into teaching. An example is an art teacher using digital resources to complement their curriculum.

For more information on the TPACK model, visit: [TPACK: Using the technological pedagogical content knowledge framework in classrooms.](#)

[SAMR Model \(Substitution, Augmentation, Modification, Redefinition\)](#)

The SAMR (Substitution, Augmentation, Modification, Redefinition) model is a framework that helps educators assess and evaluate the technology they use in their classroom. The model encourages teachers to move beyond simply substituting technology for traditional teaching methods and instead focus on how technology can transform learning experiences. The SAMR model classifies technology integration into four levels:

- Substitution: Technology is used as a direct substitute for traditional methods.
- Augmentation: Technology offers some improvements to traditional methods.
- Modification: Technology allows for significant redesign of tasks, leading to more active learning.
- Redefinition: Technology enables entirely new tasks and learning experiences that were previously inconceivable.

Watch this 2 minute video on SAMR for more information.



The SAMR Model. [Video: 2:11 minutes. Closed Captioned.]

For more information on the SAMR model, visit [The SAMR Model Explained.](#)

References

- Best, J. (2022, September 21). [The SAMR model explained \(with 15 practical examples\)](#). 3P Learning.
- Geoffrey, J. (2107). [The RAT Model](#). Youtube.

Pappas, C. (2023, May 2). [TPACK: Using the technological pedagogical content knowledge framework in classrooms](#). eLearning Industry.

Read, M. (2022). [RAT](#). *EdTechnica*.

Spencer, J. (2015). [The SAMR Model](#). Youtube.

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5.5.1: Instructional Models

Instructional Models for Effective Technology Integration

Now, let's explore instructional models and strategies that can incorporate technology effectively.

- **Blended Learning:** Blended learning combines traditional face-to-face instruction with online learning components. For example, a science teacher might use in-class lectures alongside online simulations and discussion forums to enhance the learning experience.
- **Flipped Classroom:** In a flipped classroom, students review lecture content at home through videos or online resources, freeing up classroom time for interactive discussions, activities, and problem-solving. For instance, math teachers might assign video lessons for homework and then use class time for solving math problems collaboratively.
- **Hybrid Classrooms:** A hybrid classroom combines in-person and online instruction but allows for more flexibility. Students can choose whether to attend in person or participate online, accommodating various learning preferences and schedules. (Typically, a learner will choose one modality at the beginning of the term and stay with that same modality throughout the course.) The classroom has technology which enables the class to be taught in both face to face and online at the same time.
- **Hyflex Model:** The hyflex model takes flexibility to the next level, allowing students to choose their mode of instruction daily. In this module, learners can attend in person, participate online, or switch between the two based on their needs. The classroom has technology which enables the class to be taught in both face to face and online at the same time.



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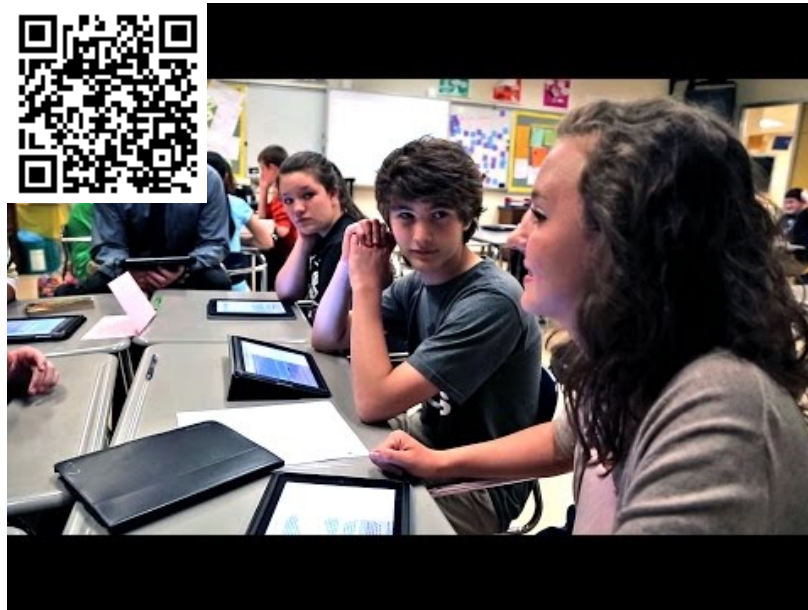
- **Online Collaborative Projects:** Online collaborative projects encourage students to work together on assignments, even when they are physically separated. Tools like Google Docs, shared whiteboards, or project management platforms facilitate collaboration. For instance, students from different locations can collectively research and create presentations on global environmental issues, promoting teamwork and digital literacy.
- **Gamification:** Gamification involves incorporating game elements, such as points, badges, and leaderboards, into the learning process to motivate and engage students. Educational games and platforms can make learning more interactive and enjoyable. For instance, a history teacher might use a historical role-playing game to immerse students in historical events, making learning both fun and informative.
- **Personalized Learning Pathways:** Personalized learning pathways use technology to tailor instruction to individual student needs. Adaptive learning platforms analyze student performance and adjust content and activities accordingly. For example, an English teacher might use adaptive software to provide custom-tailored reading recommendations and assignments based on each student's reading level and interests.
- **Synchronous and Asynchronous Learning:** Synchronous learning occurs in real-time, with students and instructors interacting simultaneously, often through video conferencing. Asynchronous learning allows students to access materials and complete assignments at their own pace. Combining both approaches provides flexibility and engagement. For instance, a language teacher might conduct live speaking practice sessions via video conferencing while providing recorded grammar lessons for students to review at their convenience.
- **Project-Based Learning with Technology:** Project-based learning integrates technology to guide students through in-depth, real-world projects. Students can conduct research, collaborate, and present their findings using digital tools. For example, in a

biology class, students might use online databases and data visualization software to investigate local environmental issues and propose solutions.

- **Peer Feedback and Assessment Tools:** Technology can facilitate peer feedback and assessment. Online platforms enable students to review and provide constructive feedback on each other's work. For instance, in a creative writing class, students can use a peer assessment tool to evaluate and offer suggestions on their classmates' stories, improving both writing skills and critical thinking.

These teaching methods and strategies show the many ways technology can improve and change school for the better. Teachers can pick the right approach for what they want students to learn. Then they can use it to make an interesting classroom that gets all students involved. Students today are different and learn in their own ways. The right technology approach helps teach so they all understand and keep up. This lets teachers customize how they guide students by what works best for different needs. The end goal is to have an active classroom where students learn well with technology's help.

Watch this video on some instructional strategies shared by instructional coaches in a school setting. Even though it is a few years old, the content and tips are relevant today.



Instructional Coaching: Driving Meaningful Tech Integration. [Video: 5:26 minutes. Closed Captioned]

References

Edutopia. (2015) [Instructional Coaching: Driving Meaningful Tech Integration](#). (2015). Youtube.

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5.6: Chapter Summary and Knowledge Check

Chapter 5 Wrap Up



In this chapter, we explored essential ideas about curriculum standards, benchmarks, and integrating technology into education. We began by understanding curriculum standards, which are guidelines that outline what students should learn at each grade level. We then looked at benchmarks, which break down these standards into smaller steps to track progress. The chapter also focused on using technology in education, showing how it can make learning more engaging and personalized. Real-life examples demonstrated how technology brings abstract concepts to life. We also discussed challenges, such as the need for teacher training and ensuring fair access to technology. The chapter ended by highlighting key points for planning effective technology use in education, stressing alignment with learning goals and the importance of considering students' needs.

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Check Yourself

Review the following questions to self-check your knowledge on the content in this chapter. The answers can be found at the bottom of this page.

Question 1: What are curriculum standards? A) Guidelines for designing school buildings B) Instructions for creating lesson plans C) Guidelines for what students should know and be able to do at each grade level D) Rules for teacher conduct

Question 2: True or False. Learning benchmarks provide detailed, incremental steps that students should achieve on their way to meeting broader curriculum standards by the end of the school year.

Question 3: What is technology integration (curriculum integration)? A) Designing fashion accessories using digital tools B) Incorporating the use of technology tools and applications as part of classroom teaching and learning activities C) Creating a new social media platform for education D) Implementing traditional teaching methods without any technological assistance

Question 4: True or False: One of the benefits of technology integration in education is that it will always enhance student focus and understanding, regardless of the number of apps or tools introduced.

Question 5: How can technology enhance student engagement and motivation in learning? A) By decreasing the time students spend on educational apps B) By making learning less interactive and hands-on C) Through the appeal of interactive digital learning tools and novel high-tech experiences D) By avoiding the use of multimedia creation activities

Question 6: Which of the following is a benefit of using technology in the classroom? A) Decreasing student test scores B) Impairing comprehension and retention C) Catering to only one learning style D) Providing students with opportunities to build vital skills for the modern world and future careers

Question 7: (Select all that apply) Select the correct aspects to consider when planning for technology integration in teaching and learning: A) Ignore learning objectives and focus solely on technology features B) Align with learning objectives and academic standards C) Consider traditional instruction methods alongside technology enhancements D) Discourage participation and collaboration E) Ensure technology meets accessibility standards

Answers: 1: C, 2: True, 3: B, 4: False, 5: C, 6: D, 7: B, C, E

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CHAPTER OVERVIEW

6: Trends and Best Practices in Educational Technology

Chapter Learning Outcomes

- Identify instructional strategies for differentiated online learning experiences.
- Explore the trends in online learning and virtual environments.
- Identify the skills and strategies you need to know as an online teacher.
- Explore how online technologies and practices are changing the ways we teach and learn.



In this chapter, you will dive into the trends shaping virtual environments and explore how online technologies are transforming the landscape of education. You will discover how these technologies are changing the way we teach and learn, and gain insights into the skills and strategies essential for successful online teaching. You will also learn about instructional strategies designed for differentiated online learning experiences, helping you adapt content, instruction, and assessment to meet diverse learner needs.

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[6.1: Trends and Technologies in Online Education](#)

[6.1.1: Technological Trends in Education, cont.](#)

[6.2: The Revolutionary Shift to Online Teaching and Personalized Learning](#)

[6.2.1: The Revolutionary Shift to Online Teaching and Personalized Learning, Cont.](#)

[6.3: Core Skills and Innovative Strategies for Online Educators](#)

[6.4: Crafting Differentiated Learning Experiences in Online Education](#)

[6.5: Chapter Summary and Knowledge Check](#)

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SECTION OVERVIEW

6.1: Trends and Technologies in Online Education

Section Learning Objectives

- Explore trends in virtual environments, including online courses, blended learning, and remote education.
- Explore emerging technologies and their impact on online learning experiences.

The Evolving Landscape of Online Learning

Education has been undergoing a significant transformation with the advent of online learning. As technology continues to advance, the landscape of how we learn, teach, and interact in an educational context is being reshaped. On this and the next page, you will explore the current trends, the role of technology, and the impact these factors have on the learning experience.



Trends in Virtual Learning Environments

Let's begin with some overall trends, and then dig a bit deeper into what some of these topics look like (White, 2023):

Growth of Online Education: Online education saw a significant rise, particularly post-2020, with 59% of U.S. college students enrolling in at least one online course.

Demographic Shifts in Online Learning: There's a notable trend towards gender parity in online education. The age of online learners is decreasing, with a growing number of younger students opting for online courses.

Changing Student Categorization: Universities are moving away from traditional demographic segmentation to focus on students' motivations and life stages.

- **Technological Evolution in Online Learning:** Advancements in VR, gamification, and AI are revolutionizing online education, enhancing student engagement and learning experiences.
- **Acceptance and Perception of Online Degrees:** Online degrees are increasingly being recognized as equivalent to in-person degrees by employers and students alike.

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Online Courses

Online courses refer to structured educational programs delivered over the internet that can either be part of a degree program or taken independently for personal or professional development. These courses often provide a more traditional learning experience with a defined start and end date, a set curriculum, and sometimes the requirement for real-time participation in lectures and discussions.

For example, many universities now offer online degree programs, allowing students to complete a bachelor's or master's degree remotely. Platforms such as LinkedIn Learning and Udemy provide a plethora of courses aimed at professional development and skill acquisition, from learning programming languages like Python to mastering graphic design with Adobe Creative Suite. These courses are designed to be flexible, allowing learners to progress at their own pace, with assessments and certifications to validate their learning.

Massive Open Online Courses (MOOCs)

MOOCs, on the other hand, are designed to be accessible to a large number of participants simultaneously. They are typically free, with the option to pay for a certificate of completion. MOOCs are less formal than traditional online courses and often do not count

towards college credit. They are ideal for lifelong learners who are interested in expanding their knowledge without the commitment to a full degree program or the constraints of a scheduled class.

Some of the current trends in MOOCs include (Industry Research Company, 2023) :

1. **Market Growth:** The global MOOCs market is expected to experience significant growth, with the market size projected to reach multimillion USD by 2029 and expand to USD 39.71 billion by 2030
2. **Certifications and Specializations:** Many MOOC providers have started offering certifications for a minimal fee, and there is a growing emphasis on specialized courses in technology, business, management, arts, humanities, and science subjects.
3. **Adaptation to Regulatory Changes:** There is a focus on understanding and adapting to regulatory and policy changes that could impact the MOOCs market, as well as emerging trends and market disruptors that are likely to shape the industry.
4. **Technology Integration:** The integration of technology trends such as artificial intelligence (AI) is reshaping the MOOCs landscape, with the development of virtual assistants and personalized learning experiences for students of all ages.
5. **Global Accessibility and Equality of Education:** MOOCs are seen as a means to provide equal access to education, with the potential to reach students in remote or isolated areas, as well as an increasing focus on preparing high school students for diverse career paths.

Demographic Shifts in Online Education

The gap between male and female students in online programs is narrowing, reflecting trends seen in traditional campus programs. Secondly, the age demographic of online learners is shifting. Younger students, previously more inclined towards traditional on-campus education, are increasingly opting for online courses. This indicates a shift in online education's appeal, reaching beyond working professionals to include conventional students right out of high school (White, 2023).

Blended Learning Models and Remote Education

Blended learning combines traditional face-to-face classroom methods with online activities, providing a balanced approach that can cater to different learning styles. For instance, a high school in California may use a flipped classroom model where students watch lectures online at home and engage in hands-on activities in class. This method not only facilitates self-paced learning but also enriches the classroom experience with more interactive and collaborative tasks.

Remote (synchronous) education has become more prominent due to circumstances such as the COVID-19 pandemic, which forced many institutions to shift to remote teaching. This mode of education relies on live video conferencing tools like Zoom and Google Meet, allowing real-time interaction between instructors and students. A case in point is the rise of virtual labs in science courses, where students can perform experiments virtually, ensuring learning continuity despite physical distance.

Both of these models further support the trend of focusing on more flexible modalities to meet student needs.

References

Industry Research Company. (2023, September 7). *MOOCs market analysis 2023-2030: Technology trends and future developments*. LinkedIn.

White, S. (2023). *2023 Trends in Online Education*. Study.com

6.1.1: Technological Trends in Education, cont.

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SECTION OVERVIEW

6.1.1: Technological Trends in Education, cont.

Emerging Technologies in Online Learning

Artificial Intelligence (AI) in Education

Artificial Intelligence (AI) is rapidly becoming a cornerstone of educational technology, offering unprecedented opportunities for enhancing teaching methodologies and learning outcomes. AI systems are adept at processing large amounts of data, which enables them to automate tasks like grading, give insights into student performance, and even identify areas where students may need additional help.

For example, AI-driven chatbots can provide 24/7 assistance to students, answering questions and guiding them through complex topics. Carnegie Learning's MATHia software uses AI to give real-time feedback and hints to students as they work through math problems, effectively providing a personalized tutor for each student. Moreover, AI can be used to monitor class participation and engagement, flagging educators when a student may be struggling (US Dept of Education, 2023).

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Personalized Learning Environments

Personalized learning is an instructional approach that tailors educational experiences to meet the individual needs, skills, and interests of each student. Personalized learning environments often rely on technology to help facilitate this customization. With the integration of learning analytics and adaptive learning technologies, these environments are becoming increasingly sophisticated.

A prominent example of personalized learning is the use of platforms like DreamBox Learning, which adjusts math problems and activities to fit the student's learning pace and understanding, effectively creating a custom learning path for each student. Similarly, platforms like Knewton provide resources and assignments that are dynamically adjusted based on real-time student data, ensuring that each student can work at an appropriate challenge level.



Both AI and personalized learning are not just limited to academic subjects but extend to other areas like music and arts. AIVA, an AI composer, for instance, helps music students create compositions by learning from their style and suggesting harmonies and melodies. This not only helps students learn composition techniques but also encourages creativity by allowing them to experiment with AI-suggested variations they might not have considered otherwise.

AI in education is focusing on automation, analytics, and assistance, whereas personalized learning is about adapting educational content and paths to the learner's pace and style. Both are transformative aspects of the online educational landscape, deeply interconnected yet distinct in their applications and implications (FulleStop, 2023).

Virtual Reality (VR) and Augmented Reality (AR)

VR and AR technologies are revolutionizing the online learning experience by offering immersive environments. Medical students, for instance, use VR to perform virtual surgeries, providing a risk-free and scalable alternative to traditional training. Similarly, AR apps can overlay historical facts on real-world locations, enhancing the learning experience for students in subjects like history or geography.

Communication and Collaboration Tools

Digital tools for communication and collaboration are critical in an online learning environment. Slack and Microsoft Teams help support class discussions and group work, mirroring the collaborative nature of a physical classroom. Online assessment tools also provide teachers with insights into students' understanding, allowing for timely feedback and support.

The evolution of online learning is a testament to the transformative power of technology in education. With the integration of emerging technologies and innovative instructional strategies, the online learning experience is becoming increasingly sophisticated and accessible. As we continue to explore and understand the potential of these developments, the future of education looks promising, with endless possibilities for learners around the globe.

References

- Çetinkaya, M. (2016). [Design of personalized blended learning environments based on web-assisted modelling in science education](#). *International Journal of Evaluation and Research in Education*, 5(4), 323–330.
- FulleStop. (2023, November 21). [Personalized Learning: How AI Is Shaping the Future of Education](#). *eLearning*.
- US Department of Education. (2023). [Artificial Intelligence](#). Office of Educational Technology. US Department of Education.

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SECTION OVERVIEW

6.2: The Revolutionary Shift to Online Teaching and Personalized Learning

Section Learning Objectives

- Explore how online technologies and practices have revolutionized traditional teaching and learning methods.
- Explore the advantages and challenges of online learning environments.
- Discuss the shift towards student-centered learning and personalized instruction in online settings.

Redefining Education: The Revolutionary Shift to Online Teaching and Personalized Learning

As we have stated earlier in this chapter, the world of education is undergoing a significant transformation, thanks to the advent of online technologies, and more recently the more general access to AI and Large Language Models (LLM) tools. On this and the next page, you will explore how these changes are reshaping the way we teach and learn. With digital platforms, educational content has become more accessible, interactive, and adaptable to different learning styles, marking a departure from traditional teaching methodologies.

The Impact of Digital Tools on Traditional Learning

The integration of digital tools into education has significantly redefined the roles of teachers and the dynamics of the classroom, leading to a more interactive and collaborative learning environment. The following are some impacts of digital tools and technological advancements on education (AR Research Staff, 2023).

Shift in Teaching Roles

- **Facilitators of Learning:** In the past, teachers were primarily seen as the main source of knowledge in a classroom. However, with the integration of digital tools, their role has shifted to that of facilitators or guides. For instance, in a science class, a teacher might use an online simulation from a website like PhET Interactive Simulations to demonstrate a complex physics concept, guiding students through the exploration and helping them draw conclusions.
- **Curators of Digital Content:** Teachers now curate a mix of digital resources, such as videos, podcasts, and interactive tutorials, to enhance the learning experience. For example, a history teacher might use primary source documents available online or interactive timelines to bring historical events to life.
- **Adapting to New Technologies:** Teachers are continually learning and adapting to new technologies. They might use tools like Google Classroom to assign and grade work, or employ educational apps like Kahoot! for interactive quizzes, which not only makes the learning process more engaging but also helps in tracking student progress (STEMScopes, 2023).



Empowerment of Students

Access to a Wealth of Information: The digital age has provided students with access to a vast array of information sources. Platforms like Khan Academy, Coursera, and even YouTube allow students to explore additional materials beyond the classroom, leading to a more in-depth understanding of subjects.

Active Learning and Critical Thinking: With ready access to information, students are encouraged to be more active in their learning process. They can conduct research, engage in online forums, or take part in virtual experiments, which fosters critical thinking and independent learning.

Personalized Learning Paths: Digital tools enable students to learn at their own pace. For example, a student struggling with algebra can watch tutorial videos on YouTube or use apps like Photomath to understand concepts at a comfortable pace.

- **Collaboration and Communication:** Technology has also enhanced the ability of students to collaborate. Tools like Microsoft Teams or Google Docs allow for real-time collaboration on projects, breaking down geographical barriers and encouraging teamwork and communication. *Image generated using DALL·E 3 (CC BY)*

The impact of digital tools on traditional learning has been profound and multifaceted. By shifting the role of teachers to facilitators and empowering students with greater access to information and personalized learning tools, education has become more dynamic, interactive, and tailored to the needs of the digital generation. This transformation, while challenging, offers exciting possibilities for the future of education (ALI Research, 2023).

Let's continue our exploration with a more in-depth look at advantages and challenges in online learning.

Advantages and Challenges of Online Learning

Advantages of Online Learning Environments (Jain, 2023).

Flexibility and Accessibility

- **Learning at One's Own Pace:** Online learning breaks away from the traditional classroom schedule, allowing students to access materials and complete assignments at times that work best for them. This is particularly advantageous for adult learners who may be balancing education with work and family commitments.
- **Accessibility for Diverse Learners:** Online platforms can be a boon for students with disabilities or those who live in remote areas. For example, video lectures with subtitles help hearing-impaired students, while those in rural areas can access the same quality of education as their urban counterparts.

Global Connectivity

- **Cross-Cultural Exchange:** Online platforms enable students from different cultural backgrounds to collaborate and learn from each other. For instance, in a MOOC about environmental science, a student in Brazil might gain insights from a peer in Norway, broadening their understanding of global environmental issues.
- **Expertise from Around the World:** Students have the opportunity to learn from international experts and guest lecturers who may not be available in a traditional classroom setting.

Scalability

- **Reaching More Students:** Online courses can accommodate thousands of students at once, something impossible in a physical classroom. This scalability makes higher education more accessible to a larger population.
- **Resource Efficiency:** Digital resources like e-books and online journals reduce the need for physical materials, making education more sustainable and cost-effective.

Challenges in Online Education (Sharma, 2023)

Digital Divide

- **Inequality in Access:** Not all students have reliable internet access or the necessary devices to participate in online learning, leading to unequal educational opportunities. This is a significant issue in less affluent communities and developing countries.
- **Efforts to Bridge the Gap:** Initiatives like providing low-cost or free internet access, and loaning devices to students, are essential to address this divide. *Image generated using DALL·E 3 (CC BY)*



Self-Discipline Requirements

- **Need for Strong Self-Motivation:** Online learning requires a high level of self-discipline and time management skills. Without the structure of a physical classroom, some students might struggle to keep up with their studies.
- **Developing Self-Regulation Skills:** Programs that include training in time management and self-regulation can help students adapt to the demands of online learning.

Quality Concerns

- **Maintaining Academic Rigor:** Some individuals and organizations express concerns that online courses might not offer the same depth of learning as traditional classes. Ensuring that online courses meet rigorous academic standards is crucial.

- **Effective Assessment Methods:** Developing robust and fair assessment methods for online learning is essential to ensure that the integrity of educational qualifications is maintained.

References

Jain, J. (2023, May 3). [Top 10 benefits of online learning apps development in 2023](#). Educational Technology.

Sharma, N. (2023, November 24). [5 key challenges to online education in 2023 - Hurix](#). Hurix Digital.

ALI Research. (2023, July 21). [Digital vs traditional: How digital education is changing the Educational Landscape](#). STEMscopes.

6.2.1: The Revolutionary Shift to Online Teaching and Personalized Learning, Cont.

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SECTION OVERVIEW

6.2.1: The Revolutionary Shift to Online Teaching and Personalized Learning, Cont.

Exploring Student-Centered Learning

In recent years, there's been a significant shift in educational paradigms from traditional teacher-centered approaches to student-centered learning. This approach prioritizes the needs, abilities, interests, and learning styles of the individual student, placing them at the heart of the educational experience. In online settings, this shift is particularly prominent, enabled by a range of digital tools and platforms.

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Key Aspects of Student-Centered Learning

Active Learning and Engagement



Especially within online platforms, active learning and engagement have become important concepts. Active learning is a teaching method that involves engaging students directly in the learning process, rather than having them passively receive information (Brame, 2016). It's about making learning an active, dynamic experience where students are participants, not just spectators. This approach is designed to enhance understanding, retention, and application of knowledge.

In online education, active learning is particularly significant. Unlike the traditional classroom setup where listening passively to lectures is common, online platforms are designed to foster more interaction and involvement. This is achieved through various interactive elements such as quizzes, discussion forums, and collaborative projects. For instance, educational platforms like Edmodo or Google Classroom offer environments where students can actively participate in discussions, work together on group projects, and get immediate feedback on their work. These tools transform the learning experience into something more engaging and participatory, making it not only more enjoyable but also more effective in helping students grasp and retain information.

Flexibility in Learning Paths



Flexibility in learning paths and the ability to learn at a personalized pace stand out as key concepts in student-centered learning. Flexibility in learning paths refers to the ability of educational programs to adapt to the varied needs and preferences of different learners, rather than following a rigid, one-size-fits-all approach. This includes offering various types of content, different methods of instruction, and allowing learners to choose what they learn and when they learn it. Personalized pace, on the other hand, is an aspect of this flexibility that specifically allows students to progress through educational materials at a speed that suits them best. It

acknowledges that everyone learns differently - some grasp concepts quickly, while others may need more time to understand.

In the context of online learning, this flexibility and personalization are particularly impactful. Platforms like Khan Academy exemplify this approach by providing a wealth of practice exercises and instructional videos. Students can use these resources as needed, moving quickly through topics they find easy and spending more time on those they find challenging. This model not only caters to individual learning speeds but also empowers students to take charge of their learning process, leading to a more effective and satisfying educational experience.

Diverse Learning Materials



The use of diverse learning materials plays a crucial role in catering to the varied needs of learners. Diverse learning materials refer to a wide range of educational resources designed to suit different learning styles and preferences (Gronseth, 2018). These materials go beyond traditional textbooks, encompassing digital libraries, educational apps, multimedia content, and interactive tools. They are tailored to engage different types of learners, whether they process information best through visual, auditory, or kinesthetic (hands-on) methods.

For instance, digital libraries offer a vast array of reading materials for those who learn best through text. Educational apps can provide interactive and gamified learning experiences, ideal for kinesthetic learners. And for visual learners, multimedia content

such as videos plays a significant role. Platforms like YouTube host channels like CrashCourse, which use engaging visuals and animations to break down complex subjects into digestible, visually appealing segments. This diversity in educational materials ensures that learning is not only more inclusive but also more engaging and effective, as it aligns with the individual learner's natural way of processing information.

Personalized Instruction in Online Settings



Personalized instruction and adaptive learning technologies are transforming how individuals learn in online settings. Personalized instruction refers to tailoring the educational experience to meet the unique needs, abilities, and learning styles of each student. This approach moves away from the traditional 'one-size-fits-all' model, instead focusing on delivering content that is most relevant and effective for each learner.

Adaptive learning technologies are at the forefront of this personalized approach. These are sophisticated, AI-driven systems that use data analytics to continually assess a student's performance and adjust the learning content accordingly. This means that the educational material can dynamically change to suit the learner's current level of understanding and proficiency. For example, DreamBox Learning, an online math platform, exemplifies this technology. It responds in real-time to a student's inputs, adjusting the complexity and nature of math problems to suit their individual learning pace. This ensures that the challenges presented are just right—neither too easy that they become boring, nor too hard that they become discouraging. Such technologies make learning more engaging, efficient, and tailored to each student's unique learning journey.

Feedback and Assessment



Feedback and assessment play a pivotal role in shaping a student's educational journey. A key component of this process is the provision of immediate and personalized feedback (Albashir, et. al, 2016). This type of feedback refers to the swift and customized responses that students receive on their assignments, quizzes, and other learning activities. Unlike traditional settings where feedback can take days or weeks, many online systems are equipped to provide instant evaluations, helping students understand their performance in real-time. This immediacy not only keeps students engaged but also allows them to quickly identify and work on their strengths and areas for improvement.

For example, digital tools such as Turnitin, Grammarly, and the Editor function in Microsoft Word are revolutionizing the way feedback is provided. These tools do more than just check for grammatical errors or plagiarism; they offer detailed, constructive feedback on writing styles, clarity, and other critical aspects of writing. This helps students refine their skills and improve their work continuously. Immediate and personalized feedback in online learning environments, therefore, is not just about providing quick responses; it's about offering tailored guidance that enhances the learning process, making it more effective and responsive to individual needs.

Collaboration and Peer Learning



Collaboration and peer learning have emerged as fundamental elements, drastically enhancing the learning experience. Collaboration and peer learning refer to the process of students working together, sharing knowledge, and learning from each other, rather than relying solely on teacher-led instruction. This approach taps into the diverse perspectives and strengths of each student, enriching the learning process (McCarthy, 2015).

Online education uniquely facilitates peer interaction by breaking down geographical barriers. Students from various parts of the world, each with their own unique backgrounds and cultures, can come together in a virtual environment to share ideas, solve problems, and learn collaboratively. For example, tools like Zoom, Google Meet, and Microsoft Teams have features like virtual breakout rooms, where students can split into smaller groups to discuss topics, work on projects, or study together. These virtual spaces mimic the group collaboration found in traditional classrooms, fostering a sense of community and collective learning. This aspect of online education not only enhances understanding of the subject matter but also develops important social and communication skills, preparing students for the collaborative nature of the modern workplace.

Important Note: As always, keep in mind these key considerations for educators: ensuring that all students have access to the necessary technology, providing adequate support for those struggling with self-directed learning, and maintaining active engagement in a virtual environment.

References

- Al-Bashir, M., Kabir, R., & Rahman, I. (2016). *The value and effectiveness of feedback in improving students' learning ...* Journal of Education and Practice .
- Brame, C. (2016). *Active learning*. Vanderbilt Center for Teaching.
- Gronseth, S. L., Michela, E., & Ugwu, L. O. (2018). *Designing for diverse learners*. Designing for Learning.
- McCarthy, J. (2015, September 9). *Student-centered learning: It starts with the teacher*. Edutopia.
- U.S. Department of Education, Office of Vocational and Adult Education,. (n.d.). *Teal center fact sheet no. 6: Student-centered learning*. TEAL: Teaching Excellence in Adult Literacy.

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SECTION OVERVIEW

6.3: Core Skills and Innovative Strategies for Online Educators

Section Learning Objectives

- Identify key competencies required for effective online teaching.
- Discuss pedagogical approaches and instructional strategies specific to online learning environments.
- Explore the use of digital tools for communication, engagement, and assessment in online teaching.

Digital pedagogy emerges as the art and science of teaching and learning through technology. On this page, we will explore some of the key competencies and skills essential for effective online teaching and online course/curriculum design.

What is Digital Pedagogy?

Digital pedagogy is the convergence of education and technology, where the teaching methods and the learning experience are enhanced through digital tools and platforms. It is about leveraging the power of digital technology to create effective, engaging, and inclusive learning experiences.

Watch this short introduction to digital pedagogy.



Effective digital pedagogy: New ways of engaging students. [Video: 2:45. Closed Captioned].

Skills and Competencies for Effective Online Educators

In the digital classroom, certain core competencies stand out as critical for educators to master. These include virtual engagement, which breathes life into the online space, innovative instructional strategies that re-imagine traditional learning activities for the digital frontier, and pedagogical adaptability, the educator's ability to flex and mold their teaching approach to the dynamic online environment. There is no magic and immediate way to obtain these skills. They take time, research and practice, but doing so will make you a much better online instructor! Below, we'll define these key skills and share some practical strategies for educators to develop and enhance these crucial competencies to help support your online (and designing) teaching success.

Virtual Engagement

Virtual engagement is the ability to create a dynamic and interactive online learning environment where students are not passive recipients but active participants. Some strategies to learn and/or improve your skills in this area include:

- **Professional Development:** Attend webinars and work interactive online engagement sessions and discussion boards.
- **Peer Observation:** Collaborate with peers to observe and learn from their virtual engagement methods.

Innovative Instructional Strategies

What is meant by innovative instructional strategy skills? It is the use of creative and effective teaching methods that are specifically designed for the online learning environment. Here are some suggestions and strategies to learn or improve your skills in this area:

- **Experimentation:** Try out different strategies like storytelling, gamification, and problem-based learning to see what resonates with your students. There are many, many online tools that you can explore to help you learn and implement this strategy.
- **Continuing Education:** Take courses in educational technology to stay abreast of the latest tools and trends.
- **Feedback Loop:** Regularly solicit feedback from other instructors on what works for them, and from students on which strategies are helping them learn effectively.

Pedagogical Adaptability

Pedagogical adaptability is the capacity to adjust teaching methods and styles to accommodate the varying needs and preferences of students in the online setting. Like all of the skills, this is important, and requires practice to be able to identify needs, as well as employ proper strategies to help your learners. Some ways to help improve or develop your skills might include:

- **Reflective Practice:** Continuously reflect on your teaching practices and be willing to make necessary adjustments.
- **Resource Utilization:** Make use of various educational resources available for online teaching to diversify your teaching methods. This will require some practice and understanding of different tools, and how each will support specific learning needs.
- **Mentorship:** Seek guidance from experienced online educators who can provide insights into adaptable teaching practices. Perhaps you can join a community of practice. A community of practice (CoP) refers to a group of people who share a common interest or a profession and come together to fulfill both individual and group goals. They engage in collective learning by interacting regularly, sharing information and experiences, and working collaboratively to improve their skills and knowledge in a specific domain. Communities of practice can exist within an organization, across various sectors, or online, and are characterized by mutual interests and shared resources. Do a quick internet search for local, regional or national CoP to find one of interest, or even develop one in your own organization.

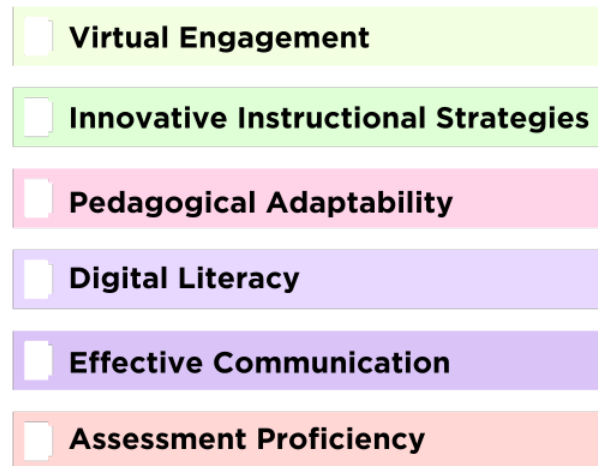


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Digital Literacy

Digital literacy is not just about knowing how to use a computer. For educators, it's a crucial skill that includes the ability to use a range of digital tools and platforms effectively, supporting and enhancing the teaching and learning experience. This literacy is pivotal in today's educational landscape, where technology is an integral part of our classrooms (and elsewhere!). Here are some strategies to help you learn or improve your digital literacy.

- **Tech Training:** Engage in training sessions to learn about new educational technologies.
- **Self-learning:** Dedicate time to independently explore and familiarize yourself with different digital tools.
- **Networking:** Join online communities of educators to exchange knowledge about digital resources and tools.

Effective Communication

Effective communication is the cornerstone of any successful online educational experience. It involves the clear and impactful exchange of ideas and information between the educator and students, ensuring that learning objectives are understood and met. In a virtual environment, where face-to-face cues are absent, the importance of articulating messages clearly and fostering an open dialogue cannot be overstated. It's about making sure that every student feels heard and engaged, and that the learning material is

conveyed in a manner that can be easily grasped, irrespective of the digital medium used. This skill is pivotal for educators to master, as it directly influences the quality of education and the strength of the learning community they build online. Here are a few strategies to help support effective communication skills (focused in an online environment):

- **Active Listening:** Practice active listening during student interactions to improve responsiveness. This listening could be during virtual sessions or written "listening." You can connect with another to practice, or do a quick internet search to find online virtual listening practice tools.
- **Clear Writing:** Enhance your written communication skills, as much of online interaction is text-based. Connecting with someone in your organization, a colleague, or a friend who is a writing expert for some assistance or feedback. Or again, if you do a quick internet search (for example, "online tools to improve my writing skills"), you will find a plethora of resources.
- **Empathy Training, Cultural Awareness Training, Equity Training:** Develop empathy to better understand and respond to student communications. These skills will all help support better understanding and communication with your learners.

Assessment Proficiency

Assessment proficiency is about crafting and executing evaluations that accurately reflect each student's understanding and mastery of the subject matter in a virtual setting. Effective assessments are vital—they not only gauge learning progress but also guide educators in tailoring instruction to meet diverse learning needs. Recognizing the unique challenges that online environments pose, such as ensuring academic integrity and providing meaningful feedback, additional training may be necessary. By enhancing their assessment proficiency, educators can ensure that their assessments are not just a formality, but a powerful tool for enhancing and directing the learning journey of their students. Some ideas to get started or to further improve your assessment development skills:

- **Assessment Design Workshops:** Participate in workshops to learn how to create effective online assessments.
- **Collaboration:** Work with other educators to develop assessments that are meaningful and relevant.
- **Research:** Stay informed about best practices in online assessment through current educational literature.

Reference

OpenLearn. (2022). *Effective digital pedagogy: new ways of engaging students*. Youtube. The Open University.

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SECTION OVERVIEW

6.4: Crafting Differentiated Learning Experiences in Online Education

Section Learning Objectives

- Discuss the importance of differentiation in online learning.
- Explore instructional strategies and technologies that support personalized learning.
- Identify methods for adapting content, instruction, and assessment to meet diverse learner needs in online environments.

In the previous section, we explored the skills and competencies that effective online instructors and designers need. In this section, we are going to dig deeper into using those skills to develop differentiated learning experiences for our online learners.

Differentiated Learning Experiences in Online Education

It's vital to embrace effective and research-based teaching strategies that address the diverse needs of learners. This approach, known as differentiated instruction, involves designing and delivering content and assessments in ways that are tailored to individual learning preferences, abilities, and interests. Let's explore the essentials of differentiated online learning and the strategies that can enhance an instructor's ability to create a personalized learning environment.

Understanding the Importance of Differentiation in Online Learning

Differentiated instruction in an online setting acknowledges that students have varied backgrounds, learning styles, and capabilities. It is crucial for fostering an inclusive learning environment that engages all students and enhances learning outcomes. For instance, while some students may excel through text-based materials, others might find video content or interactive simulations more effective.

Differentiation in online learning is not just a beneficial strategy; it's a necessary one to accommodate the rich tapestry of student backgrounds, abilities, and interests in your virtual classroom. Embracing differentiation means recognizing that each student has a unique way of learning and varying levels of prior knowledge. Here are some strategies for instructors (and designers) to help integrate differentiation into online learner experiences.

Differentiation Strategies and Examples in Online Learning (Pappas, 2021).

Strategies	Examples
Learner Analysis	• Conducting Surveys: Implement surveys at the beginning of your course to gather information about students' learning styles, preferences, and prior knowledge. • Ongoing Assessments: Use formative assessments regularly to track progress and adjust instruction accordingly. • Student Feedback: Encourage feedback on the course materials and pace, allowing you to fine-tune your approach to meet the group's needs.
Multiple Content Formats	• Diverse Media: Integrate text, audio, and video content to cater to different sensory preferences. For instance, while presenting a concept, provide a written explanation, an audio recording, and a visual representation. • Interactive Tools: Use tools like interactive whiteboards or mind-mapping software to engage visual and kinesthetic learners. • Content Re-purposing: Convert existing content into different formats. For example, transcribe video lectures for those who prefer reading or create infographics to summarize key points.
Expanding Your Approach	• Cultural Relevance: Ensure materials are culturally inclusive and relevant, reflecting the diversity of the student body. • Learning Pathways: Create alternative pathways for students to explore a topic, allowing them to choose the method that suits them best. • Accessibility: Make sure all content is accessible, including captions for videos and screen-reader-friendly materials.
Building Your Differentiation Toolkit	• Professional Development Courses: Take advantage of courses focused on inclusive teaching and learning diversity. • Collaborative Learning Communities: Join or form communities of practice with other educators to share resources and strategies for differentiation. • Technology Workshops: Stay updated on the latest educational technologies that support differentiated learning through workshops or webinars.

Instructional Strategies and Technologies that Support Personalized Learning

As we have mentioned throughout this chapter, a one-size-fits-all approach isn't sufficient in effective online learning experiences. Personalized learning is increasingly important. (A quick reminder, personalized learning is where instruction is tailored to the individual needs, skills, and interests of each student.) Fortunately, a variety of technologies and strategies are available to support this personalized approach and can be seamlessly integrated into online courses. These tools allow educators to differentiate instruction, ensuring that each student encounters the right level of challenge and support tailored to their learning profile. For example, adaptive learning software can adjust the difficulty of exercises based on student responses, while data analytics can help teachers track progress and identify areas where individual students may need extra help. Following are some instructional and technology strategies that you can explore to support personalized learning:

Instructional Strategies

- **Flexible Pacing:** Allow students to progress through the course at their own pace, providing more time for complex topics as needed.
- **Group Work:** Encourage collaborative learning by grouping students with diverse strengths and skills.

- **Varied Assessment Types:** Use a combination of formative and summative assessments to evaluate a wide range of skills and knowledge.
- **Feedback Methods:** Provide personalized feedback through digital tools to help students understand their progress and areas for growth. Use a variety of tools including text, audio, and video.
- **Student Choice:** Offer choices in assignments to allow students to engage with the material in a way that aligns with their interests and strengths.

Supporting Technologies

- **Adaptive Learning Platforms:** Use platforms that adjust the difficulty of tasks based on individual student performance.
- **Learning Management Systems (LMS):** Leverage features within your LMS, like D2L, Blackboard, Canvas, or other platforms that may be used, to create personalized learning paths.
- **Interactive Elements:** Incorporate quizzes and interactive activities that allow students to apply their knowledge in various ways.

References

Pappas, C. (2021, May 12). *Differentiated instruction in elearning: What elearning professionals should know*. eLearning Industry.

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SECTION OVERVIEW

6.5: Chapter Summary and Knowledge Check

Chapter 6 Summary



This chapter has provided a comprehensive overview of essential strategies and skills for educators navigating the digital classroom, emphasizing the importance of digital pedagogy, personalized learning, and effective communication. As the educational landscape transforms, online technologies are redefining how we approach teaching and learning, signaling a shift towards personalized and student-centered experiences. This evolution necessitates mastering digital pedagogy and embracing innovative strategies, including differentiated instruction, to meet the diverse needs of learners in virtual settings. Educators are now exploring and integrating emerging technologies, adapting to trends like blended learning and remote education, and developing key competencies to ensure that online learning environments are both advantageous and accessible.

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Check Yourself

Review the following questions to self-check your knowledge on the content in this chapter. The answers can be found at the bottom of this page.

Question 1: What is digital pedagogy? A) The study of digital game design. B) The integration of digital technologies in teaching and learning. C) Learning how to use digital tools. D) The history of digital technology.

Question 2: Which strategy can help educators improve their virtual engagement skills? A) Limiting screen time for students. B) Conducting all lessons asynchronously. C) Using live polls during webinars. D) Avoiding the use of multimedia.

Question 3: What does 'pedagogical adaptability' refer to in an online learning context? A) The use of adaptive learning software only. B) The ability to change teaching styles to suit the online format. C) Keeping the same teaching methods as in traditional classrooms. D) Using only one type of learning resource.

Question 4: Why is effective communication crucial in online education? A) It ensures that all students are equally disciplined. B) It involves using the most sophisticated vocabulary. C) It helps in conveying information clearly and maintaining dialogue with students. D) It is only necessary for recording lectures.

Question 5: What is the significance of assessment proficiency in online teaching? A) It ensures that educators spend less time grading. B) It is about creating assessments that accurately measure online learning. C) It is only focused on multiple-choice questions. D) It refers to using assessments from textbooks without modifications.

Question 6: Which of the following is a method for adapting content in online learning? A) Using only textbooks as learning materials. B) Providing resources aligned with individual learning goals. C) Delivering content through lectures exclusively. D) Avoiding the use of any digital tools.

Question 7: How can online educators cater to different learning styles? A) By offering content exclusively in text form. B) By conducting all classes in real-time. C) By using one standardized test for all students. D) By providing learning materials in various formats like videos, podcasts, and PDFs.

Question 8: What is the role of adaptive learning platforms in personalized learning? A) They discourage students from using digital tools. B) They provide the same level of difficulty to all students. C) They adjust the content based on individual student performance. D) They eliminate the need for educators in the learning process.

Question 9: Which of the following is a benefit of learner analysis in differentiated online instruction? A) It helps understand the diverse needs of students. B) It standardizes the learning experience for all students. C) It reduces the need for assessments. D) It ensures that students do not interact with each other.

Question 10: Why should online educators engage in professional development courses? A) To limit their use of technology in teaching. B) To learn new strategies for in-person teaching only. C) To stay current with educational technologies and strategies for differentiation.

Answers: 1:B, 2:C, 3:B, 4:C, 5:B, 6:B, 7:D, 8:C, 9:A, 10:C

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CHAPTER OVERVIEW

7: Evaluating Educational Technology

Chapter Learning Outcomes

- Identify sources of information for evaluating educational technology and digital media.
- Describe and explain the key criteria used to evaluate Web resources.
- Describe the tools for evaluating the effectiveness of technology.
- Identify and compare possible sources of funding for classroom technology.

In this chapter, you will explore best practices in evaluating educational technology and digital media, some tips on integrating them into your teaching and learning, and finally some ideas for funding the technology.

There are more and more digital tools and media for education these days. How do you decide if it is right for your teaching and learning needs? Instructors and those in education making technology decisions need to be able to determine if the technology will actually help students learn. There are many reputable sources of information and rules to follow to help gather and research information about technology. There are also standards just for evaluating technology and media that offer guidelines that can help determine how a digital resource impacts learning, ethics, and other key areas. Ease of use matters too. You want to look at how user-friendly it is, what tech skills are needed, if good support is available. You also will want to develop a plan for adding it to your specific curriculum and instructional practices. Finally, how will you fund it? Will you have funding to sustain it short term or long term? These are all important considerations as you evaluate technology for your classroom.

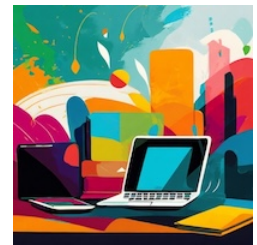


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[7.1: Sources of Information for Evaluating Educational Technology](#)

[7.2: Criteria for Evaluating Web Resources in Education](#)

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7.1: Sources of Information for Evaluating Educational Technology

Section Learning Objectives

- Identify sources of information for evaluating educational technology and digital media.

Finding Reputable Sources

When looking for new educational apps, software, or websites, it's important to evaluate carefully before choosing. There are many sources for evaluation information - but which ones are reliable? Following are some ways that you can gather information to help you in your evaluation.

Expert Reviews

Reviews from experts in education and technology can be helpful. When reading reviews, it is essential to read expert reviews from reputable sources with a focus on education technology expertise. Consider the credibility of the reviewer, review criteria, and the date of the review. Look for specific use cases, and assess potential bias. Explore multiple reviews for a broad understanding and examine user feedback for real-world insights. As you organize your information, summarize key points, be sure to evaluate alignment with educational goals, and compare reviews from different sources. Sites like EdSurge and Common Sense Education have pros/cons evaluations written by expert that can help you organize and weigh the information.

Teacher Communities

When evaluating educational technology and digital media, teacher reviews can play a pivotal role in providing real-world insights into the practical implementation of these tools. It is crucial to explore reputable platforms where teachers share their experiences, considering the quantity of reviews, and looking for specific use cases in classroom settings. Evaluating the diversity of perspectives and the overall tone of reviews helps gauge the technology's adaptability across different teaching contexts. Teachers often highlight practical tips for successful implementation, the learning curve associated with the technology, and its impact on student engagement. Teacher forums on Reddit, Edmodo, blogs, etc. often provide platforms for the sharing of authentic classroom experiences.

Professional Organizations

When assessing educational technology and digital media, examining the perspectives of professional organizations is another valuable area of information. Start by exploring position statements, research publications, and best practice guidelines from reputable organizations in the field of education. Participation in webinars and conferences organized by these entities provides access to discussions on the latest trends and research findings in educational technology. Additionally, evaluating policy recommendations and advocacy efforts from professional organizations can offer insights into the broader landscape of technology integration in education. Groups like ISTE (International Society for Technology in Education) and AECT (Association for Educational Communications and Technology) have research-based evaluation tips and offer standards and advice for selecting the best tech tools.

Product Websites

Official websites can explain product features. But they want you to buy, so view claims critically. Focus on facts like features, not exaggerated promises. Start by exploring official documentation, including user manuals and technical specifications, to understand the product's features. Examining case studies and success stories on the website offers practical insights into real-world implementations. Reading customer testimonials provides perspectives on user satisfaction, and video demonstrations help visualize the user interface and potential use cases. Additionally, analyzing pricing, licensing information, and product release notes aids in understanding the cost structure, scalability, and commitment to continuous improvement.



Figure 7.1.1: Sources of Information by Renee Albrecht. Licensed under CC BY.

Hands-on Trials

Many products offer free trials. Testing yourself gives the best sense of quality and fit. Begin by accessing trial versions or free trial periods offered by the technology providers. Establish clear objectives for the trial, involving key stakeholders such as teachers, administrators, and IT personnel to gather diverse perspectives. During the trial, assess the user interface, compatibility with existing systems, and the learning curve. Gather user feedback to understand practical implications, test the responsiveness of technical support, and explore customization options. Consider scalability, data security, and reporting capabilities to ensure the technology aligns with the institution's needs. After the trial period, analyze results, evaluating alignment with objectives, user satisfaction, integration ease, and scalability.

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7.2: Criteria for Evaluating Web Resources in Education

Section Learning Objectives

- Explore key criteria for evaluation of educational technology: accuracy, authority, objectivity, currency, relevance, equity, and accessibility.
- Consider the specific needs of students and instructional goals when assessing web resources.

Evaluating Online Instructional Resources

When selecting online educational technology and resources to use for instruction, you should thoroughly evaluate potential materials to ensure they meet key criteria. Some criteria to consider include accuracy, authority, objectivity, currency, relevance, equity, and accessibility. As we have discussed earlier, ease of use and visual interest are also very important, and while somewhat subjective, must be part of your evaluation. Before we continue our exploration of each of these criterion, watch the following TedxTalk from Dr. Shirin Shafiei Ebrahimi, who shares her research in the use of technology in education.

Use Of Technology In Education. [Video 12:02. Closed Captioned]



Accuracy

Evaluating accuracy means ensuring that the information in the resource is factual and error-free, by verifying equations, formulas, dates, and event details in math, science, and history materials. With the wealth of online educational resources available, evaluating accuracy takes on increased importance. Follow these guidelines when analyzing instructional tech for accuracy (*Young, n.d.*):

- Check facts, data, definitions against authoritative academic sources. Many websites post information without oversight. Verify accuracy through cross-reference.
- For instructional videos, independently confirm the creator's credentials and expertise. Evaluate claims and instructional methodology against accepted best practices.
- Scrutinize math and science tutorials closely. Check equations, formulas, sample problems, theorems, and laws of nature match established facts. Evaluate logical validity.
- With simulations and virtual environments, check that details match real-world evidence. Analyze if modeling of processes and systems is scientifically/historically accurate.
- For quiz/practice sites, verify question banks reflect updated facts and current consensus. Ensure scoring algorithms are free of errors.

- Review accuracy of translations for English learners. Check reading passages, audio narrations, captioning matches source content meaning.
- With AI tutors, continually evaluate responses against changing knowledge. Audit for outdated or inaccurate information periodically.

Authority

Evaluating authority means assessing the expertise of the author or creator to determine if they are knowledgeable in the subject matter. With online resources, authority is determined largely by the creator's credentials and reputation. Use these tips when evaluating authority (*Building Technology Infrastructure for Learning*, 2023):

- Authority stems from relevant expertise and providing quality, trustworthy information. Favor instructional technology designed purposefully by credentialed professionals grounded in education research.
- Research the author, organization, and publisher behind the technology. Look for bios, qualifications, mission statements.
- Give more weight to resources created by educational institutions, government agencies, and established educational companies.
- Be wary of anonymous or crowd-sourced material with no clear owning authority. Analyze who curated and filtered content.
- Examine evidence of credibility like citations, references, testimonials. Note awards, endorsements, or reviews by education experts.
- For apps and games, research developer credentials. Prioritize education specialists from academia or industry.
- For user-generated content like online worksheets, favor those with oversight mechanisms like ratings or expert verification.

Objectivity

Evaluating objectivity means assessing the balance and potential bias in the presentation of information. With endless resources available online, evaluating objectivity helps avoid biased or skewed information. Consider the following when reviewing the objectivity of instructional technology tools (*Online Equity Rubric*).

- Watch for imbalanced coverage of controversial issues. Resources should present multiple perspectives without obvious bias.
- Scrutinize language used. Favor neutral vocabulary over emotional or one-sided rhetoric.
- Check that statistics, facts, and images aren't cherry-picked to support one viewpoint over balanced presentation.
- For surveys and polls, analyze the sampling methodology. Determine if questions are neutral versus leading.
- With AI conversational agents, analyze if responses reveal bias through word choices, framing, or omissions.
- For simulations, examine if potential variables and complexities are sufficiently modeled. Or is a simplified narrative presented?
- With educational games and apps, assess if certain identities, roles, or professions are portrayed in stereotypical ways.

Currency

Evaluating currency means considering the publication date of resources to ensure they are up-to-date, especially in fields like science and technology. Publication date and version are especially important when evaluating educational technology tools. While some content is relatively static, topics like science, technology, and current events require up-to-date resources (*Building Technology Infrastructure for Learning*, 2023).

- Review dates on apps, sites, and platforms. Prioritize most recent versions and frequently updated content.
- In fast-changing fields like computer science, newer resources are crucial. However, older materials may represent “classics” with enduring relevance.
- For practice sites or apps with static question banks, check that content aligns to current standards, facts, terminology, and methods.
- With AI-based tools, assess if the knowledge model reflects current information.
- For STEM simulations, analyze if models represent established scientific consensus and current data.
- For topics like policies, events, and social issues, ensure resources use latest facts, statistics, and developments for contextual relevance.

Relevance

Evaluating the relevance means ensuring that resources directly align with specific curriculum goals, unit objectives, and student needs. Evaluating relevance ensures purposeful resource integration, not just flashy bells and whistles. Well-aligned resources enhance curriculum to help support student growth (*Young, n.d.*).

- Align tools tightly to required learning standards and skills that will be assessed. Resources should directly support mastering objectives.



Figure 7.2.1: Evaluation Criteria by Renee Albrecht. Licensed under CC BY.

- Consider student prior knowledge, skills, and interests. Will the resource engage students at an appropriate level without boring or confusing them?
- For struggling students, favor adaptive, scaffolded resources that provide remediation and differentiated instruction.
- When evaluating apps and games, analyze if activities and problem formats match instructional goals, not just entertainment value.
- With simulations, determine if models effectively demonstrate the scientific principles or skills being taught.
- For AI tutors, assess whether dialogue, feedback, and activities scaffold student learning paths in a meaningful sequence.
- Examine whether assessments match classroom-based tests and high-stakes exams. Do question formats align?

Accessibility

Evaluating for accessibility requires some knowledge of accessibility requirements. If this is an area that you are not familiar with, it would be a good time to brush up on the information, or collaborate with someone who can help you in this area. Educational technology presents new opportunities to increase accessibility, but only if consciously designed. Prioritizing accessibility reduces barriers to participation and creates more inclusive learning environments. Consider the following when evaluating accessibility (*Advancing Digital Equity for All*, 2022):

- Review compliance with web content accessibility guidelines. Check for captions, alt text, keyboard navigation, color contrast.
- For video and audio, ensure accurate closed captioning and transcripts are available.
- Assess the reading level of content. Offer options to adjust text complexity, font sizes, and background colors.
- Evaluate visual design. Icons and buttons should include descriptive labels. Information should not rely on color alone.
- For voice interfaces, consider providing alternatives like chatbots and text input.
- Check for availability of resources in languages spoken by English learners. Offer machine translation if full translations are not feasible.
- Support learning disabilities through tools like text-to-speech, dictation, digital manipulatives.

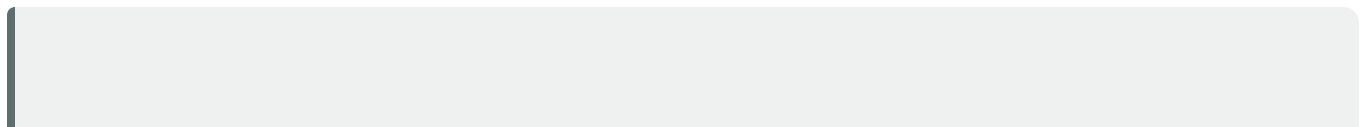
Equity

Equity is the principle of ensuring fairness, justice, and impartiality in the distribution of resources, opportunities, and benefits, with a focus on addressing and mitigating systemic disparities to provide equal access and outcomes for all individuals, regardless of their background or circumstances. It seeks to eliminate discrimination, promote inclusivity, and empower marginalized groups, creating a level playing field for everyone (*Advancing Digital Equity for All*, 2022):

Equity should be a major consideration when selecting instructional resources. Selecting equitable instructional materials demonstrates valuing diversity, fosters positive identity development and creates a more just and inclusive classroom climate. Instructors should evaluate materials through an equity lens asking:

- Are various cultural and identity groups represented? Resources should reflect diversity including race, ethnicity, gender, disability, etc. Students should be able to see themselves represented.
- Are groups portrayed in fair, accurate, non-stereotypical ways? Look for balanced depictions that avoid tokenism. Authors and perspectives from non-dominant groups should be included.
- Analyze representation of diverse identities in content and imagery. Avoid stereotypes and provide positive portrayals.
- Does content promote inclusion, empowerment and equal access? Resources should use inclusive language and examples. Historical materials should depict the roles and contributions of marginalized groups.
- Are multiple perspectives present on issues of inequality and discrimination? Avoid single narratives around oppression or privilege. Include counter-narratives from marginalized voices.
- When evaluating relevance, also consider economic equity of access. Prioritize free or low-cost tools to avoid excluded students without means from benefiting. Technologies requiring purchase may seem cutting-edge but undermine equitable participation. Favor options allowing full access regardless of family income.

On the next page, you will explore another tool, focused on equity, that you can use in your teaching and learning practice.



References

Young, J. (n.d.). [Identifying and evaluating instructional materials](#). Online Course Development Basics. CC NC SA 4.0

Peralta Community College District. (n.d.). [Online Equity Rubric](#). Peralta Community College District.

Shafiei Ebrahimi, Dr. S. (2018, July 2). [Use of Technology in Education](#). YouTube.

US Department of Education. (2022, December 22). [Advancing Digital Equity for all](#). Office of Educational Technology.

US Department of Education. (2023, August 7). [Building Technology Infrastructure for Learning](#). Office of Educational Technology.

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7.2.1: The Peralta Rubric

Section Learning Objectives

- Explore the Peralta Equity Rubric

In the last section, we discussed the importance of Equity in your analysis and decision-making when it comes to educational technology and technology resources. In this section, we will take some time to explore a tool that you can use in both your instructional and technology-related educational activities by learning about the Peralta Equity Rubric.

The Peralta Rubric, often referred to as the Peralta Equity Rubric, is a framework for evaluating educational programs, courses, or initiatives, particularly in the context of higher education, with a strong emphasis on equity and social justice. The rubric was developed by the Peralta Community College District in California, and it serves as a comprehensive tool for assessing the quality of instructional materials, pedagogy, and institutional practices in a way that ensures equitable educational experiences for all students.

The Peralta Rubric typically includes several key dimensions or categories, each with specific criteria for evaluation. These dimensions may cover a wide range of aspects related to equity in education, including curriculum design, teaching practices, student support services, and institutional policies. While the entire rubric may not apply to educational and instructional technology evaluation, there are parts of it that can be very helpful:

- **Technology:** Course structure & activities mitigate digital divide & technology access issues (a) by clarifying how required technologies support learning, and (b) by providing alternative pathways to complete course activities if students face barriers
- **Student Resources and Support:** Course highlights the ways that student services support student wellness and success.
- **Universal Design for Learning (UDL):** Course content and activities are aligned with core principles of UDL-- i.e., multiple means of representation, action & expression, and/or engagement.
- **Diversity and Inclusion:** Communications and activities demonstrate that students' diverse identities, backgrounds, and cultures are valued.
- **Image and Representation:** Images and representations in the course reflect broad diversity; exceptions are explained and discussed.
- **Human Bias:** Human biases are identified in course content and activities.
- **Content Meaning:** Communications and activities draw connections among course content, students' lives, and students' futures.
- **Connection and Belonging:** Communications and activities foster care and connection among students, and with the instructor.

It's important to note that the specific criteria and dimensions of the Peralta Rubric may vary between institutions or contexts. The rubric is a flexible tool that can be adapted to fit the specific needs and goals of the evaluating institution. Overall, the Peralta Rubric is designed to guide institutions in self-assessment and improvement efforts, helping them identify areas in which they can enhance their commitment to equity and social justice in education, thereby creating a more inclusive and supportive learning environment for all students. You can learn more about the process at [Peralta Online Equity Rubric](#).

If you wish, download the [Peralta-Online-Equity-Rubric-3.0-Oct-2020.pdf](#) to review or use.

References

Peralta Community College District. (n.d.). [Online Equity Rubric](#). Peralta Community College District.

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SECTION OVERVIEW

7.3: Applying Evaluation Criteria- Rubrics, Surveys, Data Analytics, and Feedback

Section Learning Objectives

- Identify tools for evaluating technology effectiveness
- Explore assessment rubrics, surveys, data analytics, and feedback mechanisms

Tools for Evaluating Technology Effectiveness

When assessing the effectiveness of educational technology, several tools can provide valuable insights. These tools help educators and administrators measure how well a technology enhances student engagement, contributes to learning outcomes, and satisfies user needs. Here are some user-friendly tools and approaches suitable for evaluating technology in the classroom.

Assessment Rubrics

Assessment rubrics are structured guidelines that help educators evaluate various aspects of technology use, such as content relevance, ease of use, and impact on learning objectives. For example a rubric may assess an educational app based on criteria like alignment with curriculum standards, user-friendliness, and the degree of interactivity. Here is an example Creative Commons rubric that you can review for your own use: [TechIntegrationAssessmentRubric.pdf](#) (Harris, et.al).

Surveys

Surveys collect feedback from teachers, students, and administrators about their experiences with a particular technology. They provide valuable qualitative data on user perceptions and preferences. A survey might ask teachers about the ease of integrating a new learning platform into their lessons or inquire about students' satisfaction with a specific educational app.

Data Analytics

Data analytics means looking at and making sense of numbers and data produced when people use technology. By doing this, you can spot trends, patterns, and connections. There are many places to access existing data on how well technology works for teaching and learning overall. To make a fair comparison, you should also collect data on how technology is directly affecting teaching and effectiveness in your own situation. Some examples of using for data analysis:

- **Students Use in Online Modules:** A science course has different online modules that teach different topics. Teachers can use data to see which modules students access the most and spend the most time on. By seeing the most popular modules, teachers learn which topics connect with students the best. This helps teachers reinforce concepts students like and improve modules that are less engaging.
- **Time Spent on Online Tasks:** A math app gives students practice exercises like word problems, quizzes, and interactive simulations. Data can show how much time students spend on each task. Teachers can see which tasks hold student attention longer. This helps teachers plan lessons, emphasize engaging activities, and make sure tasks support learning goals.
- **Tracking Student Progress:** Some online platforms adjust lesson difficulty to each student's ability. Data can track every student's progress, strengths, and needed improvements. Teachers can personalize teaching using this data to help struggling students with concepts they find difficult. It also helps reward student achievements.
- **Collaboration:** Online platforms allow students to collaborate on group projects. Data can detect patterns about which groups work well together on tasks. Noticing successful collaboration helps teachers encourage effective teamwork. It also shows individual contributions within groups, building a supportive learning environment.
- **Trends in Test Performance:** Data can track patterns in test scores over time - whether they improve, decline, or stay the same. Seeing performance trends helps teachers identify curriculum strengths and weaknesses. This guides teaching adjustments and interventions tailored to learning needs.

Feedback Mechanisms

Feedback mechanisms allow users to provide real-time input on their experiences with a technology. This immediate feedback helps identify areas for improvement. For example, an online learning platform may include a feature that allows students to rate the usefulness of instructional videos or provide comments on specific assignments.

References

Harris, J., Grandgenett, Ne., & Hofer, M. (n.d.). Technology Integration Assessment Rubric. CC NC ND 3.0.

7.3.1: Evidence-Based Approaches in Evaluation of Educational Technology

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7.3.1: Evidence-Based Approaches in Evaluation of Educational Technology

Section Learning Objectives

- Apply evidence-based approaches to measure student engagement, learning outcomes, and user satisfaction.

Applying Evidence-Based Approaches

On the prior page, you read about some specific strategies to alloy evaluation criteria, including using rubrics, gathering information via surveys, performing data analysis, and gathering other feedback. In this section, we want to look at taking that data and using it to make decisions, using evidence based approaches. If you Google Evidence Based Practices, you will find many different models, some have 4, 5, 6, or 7 steps. Here, we simplify the process to focus on applying the basic steps to specifically evaluating the integration of educational technology in teaching and learning.

After you read through the steps, it should feel like a "common-sense" process: Figure out the why, what, and how of your measurement process, integrate the technology, and then measure the results against where you started. Based on the data (and feedback), make improvements.

Steps to Evaluate Educational Technology Effectively

The following steps were adapted from the 7 Steps to Effective Decision Making from UMass-Dartmouth (n.d.):

1. Know Your Goals and Identify what to Measure

Understand **why** you're using educational tech. Establishing clear objectives provides a foundation for selecting appropriate metrics and ensures alignment with educational goals. Then, identify the things you want to keep track of. Some examples might be measuring student engagement indicators, learning outcome assessments, or user satisfaction survey results. Choosing measurable metrics supports accurate data collection.

2. Use Technology Tools to Gather Data

Use technology to your advantage! **How** will you collect data? Be sure the technology you're using can keep track of the things you want to measure. You may wish to integrate things like data analytics dashboards, assessment modules, and survey instruments. These tools help collect accurate information while supporting the integrity of the user experience.

3. Identify Benchmarks

In step 1, you identified **what** you were going to measure. In this step, be sure you know what level you are starting. To know if the changes you implement are effective, you need those baseline measurements for identified metrics **prior** to the introduction of modifications.

4. Implement Changes Slowly, Continuous Monitoring and Data Collection

If you want to make things better, do it bit by bit. Don't change everything at once. Making small changes helps you figure out what's really helping, and it's not confusing. Keep an eye on how things are going. Look at the quizzes, surveys, or anything else you're using to measure. See if things are getting better or staying the same. Monitoring the results helps you know if the changes are effective.

5. Data: Analysis and Comparative Analysis

Thoroughly analyze the data that you have collected to identify **trends** or **patterns**. Maybe you spend more time on a certain part or do better on quizzes. Finding what's different helps you know if the changes are making a real difference.

Conduct a **comparative** analysis against established baseline measurements (your benchmarks). Determine if the data indicates positive or negative results or trends in what you identified to be measured (i.e. student engagement, learning outcomes, and/or user



satisfaction, etc.).

Figure 7.3.1 Technology Evaluation by Renee Albrecht (CC BY).

6. Seek Feedback

Conduct interviews, focus groups, or open-ended survey questions to gather insight into your identified user (i.e. teacher, student, administrator, parents, etc.) experiences. This qualitative feedback adds context to quantitative data, offering a better understanding of the user perspective.

7. Implement Changes

If you find things that need fixing, make the changes. Implement further improvements or adjustments to address identified areas of concern or even strengthen those areas that are successful.

You aren't done yet!

A truly iterative process will continue to monitor results and make changes to improve the process. By effectively integrating the technology tools to collect data (dashboards, assessment methods, surveys, etc.), you can more easily continue the steps of Monitoring, Collecting Data, Performing Analysis, Feedback, and Implementing Changes for improvement.

Reference

UMass - Dartmouth. (n.d). 7 [Steps to Effective Decision Making](#).

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SECTION OVERVIEW

7.4: Integrating Technology into Specific Curriculum Subject Areas



Section Learning Objectives

- Identify effective ways to integrate technology in different areas (STEM, Art, Technology, Other)

This section shares some ideas for integrating technology into some different educational areas. Although the information is presented in some specific disciplines, you can likely identify strategies that you can use in your own discipline. These are just ideas to get you thinking!

STEM (Science, Technology, Engineering, and Mathematics): [\[add links\]](#)

- **Virtual Labs and Simulations:** Utilize virtual labs and simulations to provide hands-on experiences in science and engineering. Platforms like PhET Interactive Simulations or Labster offer virtual experiments, fostering experimentation without physical constraints.
- **Coding and Robotics:** Introduce coding and robotics to enhance mathematical and logical thinking. Platforms like Scratch or educational robotics kits enable students to apply STEM concepts in a creative and interactive manner.
- **Data Analysis Tools:** Incorporate data analysis tools for scientific investigations. Applications like Google Sheets or specialized tools like Vernier Logger Pro enable students to collect, analyze, and visualize scientific data.

Art

- **Digital Art Creation:** Integrate digital tools for art creation, such as Adobe Firefly, DALL E 3, Adobe Express, Canva, Midjourney, or Procreate. These platforms offer a range of tools for digital painting, graphic design, and multimedia art projects.
- **Augmented Reality (AR) and Virtual Reality (VR):** Explore AR and VR applications to provide immersive art experiences. Apps like Google Tilt Brush or Quiver allow students to create and interact with art in three-dimensional space.
- **Digital Storytelling:** Encourage digital storytelling through multimedia projects. Platforms like Adobe Spark or iMovie enable students to combine visual elements, audio, and narration to express their artistic ideas.

Technology (General):

- **Collaborative Platforms:** Utilize collaborative platforms like Google Workspace or Microsoft 365 for project-based learning. These platforms facilitate real-time collaboration and document sharing among students.
- **Gamification:** Integrate gamification elements to enhance engagement. Platforms like Kahoot! or Classcraft introduce game-based learning, making lessons more interactive and fostering healthy competition.
- **Flipped Classroom Approach:** Implement a flipped classroom approach using tools like Flipgrid, Padlet, or Edpuzzle. Students can access instructional content at their own pace, allowing in-class time for discussions, problem-solving, and hands-on activities.

Humanities, Social Sciences, Languages:

- **Podcasting:** Introduce podcasting for language arts or social sciences. Students can create podcasts to discuss literature, historical events, or cultural topics, enhancing communication and research skills.
- **Virtual Field Trips:** Take virtual field trips to historical sites or cultural landmarks. Platforms like Google Expeditions or VirtualFieldTrips.org provide immersive experiences, expanding students' understanding of different subjects.
- **Online Debates and Discussions:** Facilitate online debates and discussions using platforms like Flipgrid or Padlet. This encourages critical thinking and communication skills in subjects like social sciences or philosophy.

General Best Practices

- **Professional Development:** Provide ongoing professional development for educators to stay updated on technological advancements and effective integration strategies.

- **Access to Devices:** Ensure equitable access to devices and internet connectivity to avoid disparities in students' technological experiences.
- **Digital Citizenship Education:** Integrate digital citizenship education to teach responsible and ethical technology use across all subjects.
- **Student-Centered Approach:** Foster a student-centered approach, allowing learners to explore and express their understanding through technology in ways that align with their own interests and learning styles.

Effective integration of technology involves thoughtful consideration of specific tools and strategies tailored to each subject area. By embracing a multidisciplinary approach, educators can leverage technology to enhance learning experiences across diverse academic domains.

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SECTION OVERVIEW

7.5: Identifying Possible Sources of Funding

Section Learning Objectives

- Explore internal sources of funding to support integration of technology into education.
- Explore external sources of funding to support integration of technology into education.

Funding of Educational Technology

In the ever-evolving landscape of education, the integration of technology has emerged as a transformative force, reshaping traditional teaching and learning paradigms. This section shares some strategies for both internal and external avenues of funding, recognizing that financial support is pivotal in achieving comprehensive and sustainable technology integration. In this section, we will review some practical strategies for sourcing funds both internally and externally.

Possible Internal Funding Sources

- **School Budget Reallocation:** Schools can consider reallocating portions of their existing budget to prioritize technology integration initiatives. This may involve reviewing current spending patterns and identifying areas where funds can be redirected to support the purchase of devices, software licenses, or professional development for educators.
- **Grant Committees:** Establish internal committees or task forces responsible for identifying and securing grants to support technology integration. These committees can actively seek out grant opportunities, prepare proposals, and manage the application process.
- **Partnerships with Local Businesses:** Forge partnerships with local businesses or corporations willing to contribute financially to educational technology initiatives. These partnerships can involve sponsorships, donations, or collaborative projects that align with the business's corporate social responsibility goals.
- **Parent-Teacher Associations (PTA) Contributions:** Engage with the PTA to seek contributions for technology integration. This can include fundraising events, donation drives, or specific technology-focused campaigns to garner financial support from parents and the local community.
- **Alumni Contributions:** Reach out to alumni networks for financial support. Alumni who have benefited from technology integration during their time at the school may be willing to contribute to sustain and enhance similar opportunities for current students.
- **Community Fundraising Events:** Organize community fundraising events specifically dedicated to supporting technology integration. Events such as technology fairs, auctions, or crowdfunding campaigns can engage the community and generate funds.

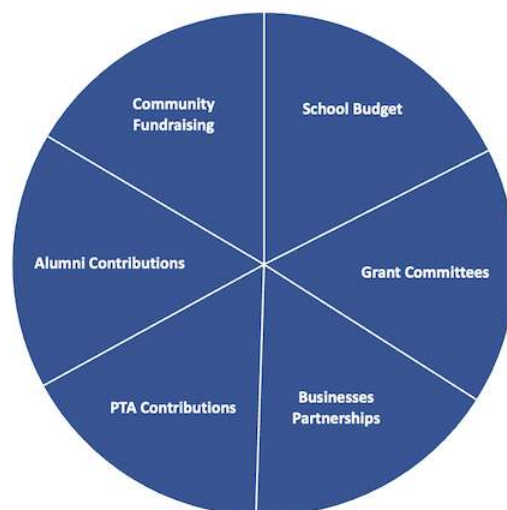


Figure 7.5.1: Tips for Successful Internal Funding by Renee Albrecht. Licensed under CC BY.

This is just an example of some possibilities and opportunities. There are likely many more internal sources to consider.

Possible External Funding Sources

- **Government Grants and Initiatives:** Explore government grants and initiatives that support educational technology integration. Many government bodies offer funding opportunities to schools and educational institutions to enhance technology infrastructure and resources.



- **Nonprofit Organizations:** Connect with nonprofit organizations focused on education and technology. Many nonprofits provide grants, donations, or in-kind support to schools looking to integrate technology into their classrooms.
- **Corporate Sponsorships and Grants:** Seek sponsorship or grant opportunities from technology companies and corporations. Many businesses have corporate social responsibility programs that support education, and they may offer financial assistance, technology donations, or in-kind contributions.
- **Foundation Grants:** Research and apply for grants from foundations dedicated to education and technology. Many foundations provide funding to support innovative technology initiatives in schools and educational settings.
- **Educational Technology Competitions:** Participate in educational technology competitions that offer cash prizes, grants, or resources to winners. These competitions often encourage innovative approaches to

technology integration in education.

- **Professional Associations and Organizations:** Explore funding opportunities from professional associations and organizations related to education and technology. These entities may offer grants, scholarships, or resources to support technology-enhanced learning environments.
- **EdTech Industry Partnerships:** Collaborate with educational technology companies and startups for funding or support. Some companies may offer grants, discounts on products, or partnerships to schools interested in piloting or implementing their technologies.

Figure 7.5.2: Tips for Successful External Funding by Renee Albrecht. Licensed under CC BY.

General Tips for Successful Funding

- **Clearly Articulate Needs:** Clearly communicate the specific needs and goals related to technology integration when seeking funding, both internally and externally.
- **Align with Educational Priorities:** Ensure that technology integration plans align with the broader educational priorities and goals of the institution, making it more compelling for funders.
- **Build Strategic Partnerships:** Develop partnerships with local businesses, nonprofit organizations, and government entities to create a network of support for technology initiatives.
- **Demonstrate Impact:** Clearly demonstrate (and share!) the potential impact of technology integration on student learning outcomes, teacher professional development, and overall educational quality.

By strategically leveraging internal and external funding sources, you and your educational institution can work to create a robust financial foundation that can support the successful integration of technology into your teaching and learning environment.

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7.6: Chapter Summary and Knowledge Check

Chapter 7 Wrap Up



In this chapter, we explored essential practices for evaluating educational technology and digital media, offering valuable insights for instructors and educational decision-makers navigating the ever-expanding landscape of digital tools. The chapter moved through the process of determining the suitability of technology for specific teaching and learning needs, emphasizing the importance of assessing its impact on student learning, ethics, and usability. It provided practical tips on sourcing information from reputable channels, following established rules, and adhering to standards designed for evaluating technology and media.

Additionally, the chapter addressed crucial considerations such as user-friendliness, required tech skills, and the availability of support. The chapter wrapped up with a discussion and some strategies for funding your technology integration.

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Check Yourself

Review the following questions to self-check your knowledge on the content in this chapter. The answers can be found at the bottom of this page.

Question 1: When evaluating educational apps, software, or websites, which source is recommended for gathering information on real-world insights into practical implementation and user experiences? A) Expert Reviews B) Professional Organizations C) Product Websites D) Teacher Communities

Question 2: When evaluating online instructional resources, which criteria ensures that the information is factual and error-free, especially in math, science, and history materials? A) Authority B) Objectivity C) Accuracy D) Currency

Question 3: What does evaluating for equity in instructional resources involve? A) Ensuring accurate closed captioning and transcripts B) Checking for captions, alt text, keyboard navigation C) Promoting inclusivity, diversity, and equal access D) Analyzing if resources align with current standards

Question 4: True or False. The Peralta Equity Rubric is primarily focused on evaluating technology and its role in educational programs.

Question 5: Which tool provides structured guidelines for evaluating various aspects of technology use, such as content relevance, ease of use, and impact on learning objectives? A) Surveys B) Data Analytics C) Feedback Mechanisms D) Assessment Rubrics

Question 6: What is the purpose of identifying benchmarks in the process of evaluating educational technology? A) To know if the changes implemented are effective B) To conduct interviews and focus groups C) To establish clear objectives for technology use D) To analyze trends and patterns in data

Question 7: (Select all that apply) Which of the following are considered best practices for effective integration of educational technology? A) Provide ongoing professional development for educators to stay updated on technological advancements and effective integration strategies. B) Ensure equitable access to devices and internet connectivity to avoid disparities in students' technological experiences. C) Get unanimous consent for all purchases from all stakeholders in the process D) Integrate digital citizenship education to teach responsible and ethical technology use across all subjects. E) Foster a student-centered approach, allowing learners to explore and express their understanding through technology in ways that align with their own interests and learning styles.

Answers: 1: D, 2: C, 3: C, 4: False, 5: D, 6: A, 7: A, B, D, E

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CHAPTER OVERVIEW

8: Security Issues and Ethics in Educational Technology

Chapter Learning Outcomes

- Identify digital threats and protection measures for educational technology.
- Explore information privacy and copyright in education issues as it pertains to educational technology.
- Explore the ethical use and wellness in educational technology.

Ensuring Digital Security and Ethical Technology Use in Schools



In an era where digital technology permeates every aspect of our lives, the importance of understanding and safeguarding against computer viruses and malicious software has never been more critical, especially in educational settings. Schools, as centers of learning and information, are increasingly reliant on technology, making them vulnerable to various digital threats. This chapter aims to provide an in-depth understanding of these risks, along with comprehensive strategies for prevention and management. We will explore the intricacies of computer viruses, the significance of network security in schools, and the pressing need for ethical guidelines in technology usage. By the end of this chapter, educators, administrators, and students will be equipped with the knowledge and tools to protect their digital environments and use technology responsibly and effectively.

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[8.1: Safeguarding Computers and Networks](#)

[8.2: Information Privacy and its Impact on Schools](#)

[8.2.1: Information Privacy- Third Party Tools](#)

[8.2.2: Digital Footprints](#)

[8.3: Ethical Issues Related to Internet Usage and AI in Education](#)

[8.3.1: Creating Ethical Digital Citizens](#)

[8.4: Copyright and its Impact on Education](#)

[8.4.1: Copyright and Education, Continued.](#)

[8.5: Safe and Healthy Uses of Technology Resources](#)

[8.6: Chapter Summary and Knowledge Check](#)

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8.1: Safeguarding Computers and Networks

Section Learning Objectives

- Identify risks and associated mitigation strategies for addressing computer virus.
- Identify risks and associated mitigation strategies for data loss and backup.

Understanding and Addressing Cybersecurity Threats in Schools

Educational technology includes all the digital tools and resources used for teaching and learning, like computers, tablets, software, and online platforms. These technologies help improve the learning experience and prepare students for a world driven by technology. However, as schools rely more on technology, they become more vulnerable to cybersecurity threats. Schools need to protect student and staff information and academic records from unauthorized access. Threats like hacking, phishing scams, and malware pose serious risks. It is important for schools to put in place strong security measures. Understanding these threats is the first step toward creating a safe learning environment that uses technology to enrich education while reducing risks. In this chapter, we explain common security issues and suggest strategies to enhance safety.



Schools depend on technology for teaching and learning. But this reliance also creates challenges, especially with computer and network security. Those working in education need to understand basic digital security to ensure a safe learning environment. The goal is to safeguard sensitive information and provide smooth technology access without disruptions from security breaches.

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Computer Viruses and Security

You've probably heard the term "computer virus." Like biological viruses, computer viruses are programs designed to spread from one computer to another and infect systems. This can lead to data loss and corruption. There are other harmful programs too, like ransomware, spyware, and worms. Each works differently to cause problems. For example, ransomware can lock important teaching materials until a payment is made to release them.

Schools need to take proactive steps to combat threats. The information technology (IT) department usually leads security efforts. But it's important for everyone to understand and follow their recommendations. Some strategies include:

- Using antivirus software to detect and stop threats before they cause damage. This acts as a shield.
- Being careful about opening email attachments and links from unknown senders. These often spread viruses.
- Regularly updating software. Updates fix vulnerabilities so malware can't get in as easily.

Ensuring Safety and Continuity in School Networks



Think of network security as your school's digital fortress. Firewalls and secure Wi-Fi work like walls and a moat, keeping out invaders. Physical security measures also help. These include locking server rooms and tethering equipment in place. This stops people from accessing your school's digital assets without permission.

The IT department usually handles network security. But it's good for all users to understand the basics. That way you can help keep the networks safe. Small steps like using strong passwords and not clicking risky links go a long way.

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Importance of Vigilant Security Practices

It's extremely important to protect student records, grades, and other school data. If this information gets out, it could lead to identity theft or cheating. Schools need clear rules on who can access what information. Training staff and students also helps. Phishing simulations teach people to spot and report real phishing emails. This boosts the human side of cybersecurity.

Comprehensive Backup and Recovery Approaches



It's not just about keeping intruders out. Schools also need plans to avoid losing important data and materials. For example, what if a teacher loses all their lesson plans due to a computer crash? Without backups, weeks of work could vanish.

Regular backups help prevent these disasters. Cloud backup services automatically store file copies securely offline. If files go missing, the school can restore the backups. Schools usually have policies for saving and managing data.

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Data Recovery and Backup Strategy Implementation

Developing a backup and recovery strategy is crucial. This involves not only regularly scheduled backups but also regular drills to restore data from backups, ensuring that the process is foolproof. Schools should employ strategies that follow the 3-2-1 backup rule: keep three copies of any important file (one primary and two backups), store the files on two different media types, and keep one copy offsite (Krogh, 2009). Keeping school technology secure takes layers of defense against threats. It also means having plans to get back on track when problems happen. The key is making security part of everyday routines. Teachers and staff should build awareness around current cyber risks for schools.

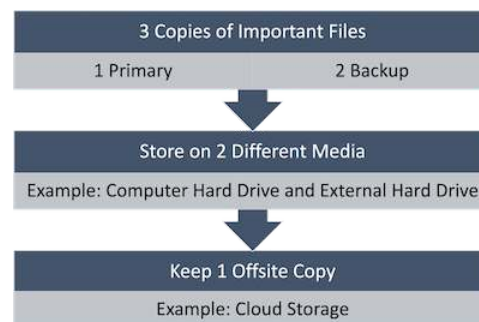


Figure 8.1.1 3-2-1 Backup Rule (Krough, 2009) by Renee Albrecht (CC BY).

Reference

Krogh, P. (2009). *The Dam Book: Digital Asset Management for photographers*. O'Reilly.

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8.2: Information Privacy and its Impact on Schools

Section Learning Objectives

- Define information privacy in educational contexts.
- Identify strategies for ensuring information privacy in educational settings.

Information privacy in education refers to the right and the practice of managing access to, and the use of, personal data held within school systems. This encompasses student information, such as grades, medical records, and personal details, as well as staff records. With the rise of digital record-keeping and online learning tools, ensuring the confidentiality of this data is paramount.

In a school setting, information privacy is not just about ethical respect for individual rights; it's also about legal compliance. Regulations such as the [Family Educational Rights and Privacy Act \(FERPA\)](#) in the United States mandate strict controls over who can see and use student educational records. A breach in information privacy can have profound consequences, ranging from identity theft to legal ramifications for the institution itself.

Ensuring Information Privacy in Schools

Watch this video from the US Department of Education to learn more about safeguarding student data when using technology:



Protecting Student Privacy While Using Online Educational Services. [Video: 9:30. Closed Captioned.]

Strategies for Protecting Digital Information (US Department of Education, 2021)

- **Understanding Legal Requirements:** Instructors must be familiar with laws governing student data privacy and ensure they are followed meticulously in their classrooms. For instance, FERPA requires that schools obtain parental consent before disclosing a student's education records.
- **Data Minimization:** Collect only the information essential for educational purposes. For example, if a student's social security number isn't necessary for a particular academic activity, it shouldn't be collected. This limits exposure in the event of a data breach.
- **Access Control:** Limit access to sensitive information to authorized personnel only. Schools can implement role-based access systems, where, say, a gym teacher would not have access to students' medical records unless necessary for health and safety reasons.
- **Secure Communication Channels:** Use encrypted communication when sharing sensitive data. If an instructor needs to discuss a student's performance with a parent, using a secure portal rather than email can prevent data interception.

- **Training and Awareness:** Conduct regular training sessions on data privacy for all staff members. A teacher, for instance, should know not to leave a laptop with access to student records unattended, and they should be aware of phishing scams that could compromise data.

Strategies for Protecting Physical Information

- **Secure Storage:** Keep physical records, like printed tests or health forms, in locked cabinets or secure areas with limited access.
- **Document Disposal:** Establish protocols for the proper disposal of sensitive documents, such as shredding before recycling.

References

US Department of Education. (2021). *Family Educational Rights and Privacy Act (FERPA)*

US Department of Education. (2015, February 26). *Protecting student privacy while using online educational services*. YouTube.

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SECTION OVERVIEW

8.2.1: Information Privacy- Third Party Tools

Privacy and Third Party Tools and Technologies

Throughout this textbook, we have been discussing different tools to use in your teaching and learning. As we research and use those tools, we need to address student and data privacy. When using third-party tools, instructors face the challenge of maintaining information privacy while leveraging these resources for enhanced learning experiences. Here are some strategies for instructors to ensure privacy when integrating third-party tools into their teaching (US Department of Education, 2014):

Privacy Strategies for Third Party Tools

Strategy and Definition	Ideas for Implementation
Vet Third-Party Tools Thoroughly: Vetting third-party tools thoroughly means carefully examining their features, especially how they handle user data, before bringing them into the classroom. It's about ensuring these tools meet the standards for privacy and security that protect students' information. For example, before using a new online grading platform, an instructor should check that it encrypts student grades and complies with educational data privacy laws.	• Conduct Research: Before adopting any tool, research its privacy policies to ensure they align with educational standards and legal requirements. • Check Compliance: Verify that the tool complies with relevant privacy laws such as FERPA, COPPA (Children's Online Privacy Protection Act), and GDPR (General Data Protection Regulation) if applicable.
Gain Informed Consent: Gaining informed consent involves clearly explaining to students and their guardians what data a third-party app collects and how it will be used, then obtaining their explicit permission. This ensures that personal information is not used without the individual's knowledge and agreement. An example is sending home a permission slip that details what an educational app does with student data before students are allowed to use it.	• Inform Parents and Guardians: When using tools that require student information, provide clear information to parents about what data will be used and how it will be protected. • Obtain Permissions: Get written consent from parents or guardians, especially for students under 13, before using any third-party services that collect data.
Limit Data Sharing: Limiting data sharing means only providing the essential information that a third-party service needs to function, and no more. This minimizes the risk of sensitive data being exposed or misused. For instance, a language learning app may only need students' first names and not their full identity details.	• Minimal Necessary Information: Share only the information necessary for the functionality of the tool—avoid providing excessive details that could compromise privacy. • Anonymize Data: Where possible, use anonymous identifiers instead of real names to minimize risks.
Use Secure Access Protocols: Using secure access protocols refers to the methods and technologies that safeguard user data from unauthorized access. This includes measures like complex passwords and two-factor authentication. If a reading app requires a login, for example, ensure it offers and enforces the creation of strong, unique passwords for each user.	• Strong Authentication Measures: Ensure that any third-party platform used has strong authentication protocols, like two-factor authentication. • Unique Credentials: Encourage or enforce the use of unique login credentials for each service to prevent breaches spreading across platforms.
Educate Students and Staff: Educating students and staff is about providing them with the knowledge they need to use technology responsibly and protect their personal information. It's also about teaching them to recognize potential privacy risks. A teacher might hold a session on identifying secure websites, using the example of checking for 'https' in a web address.	• Digital Citizenship: Teach students about the importance of privacy and how to maintain it while using online tools. • Professional Development: Offer training sessions for staff to stay updated on the best practices for data privacy.
Regularly Review Tools and Policies: Regularly reviewing tools and policies means consistently reevaluating the third-party services used and the policies governing them to ensure ongoing protection of data privacy. This could be as simple as reading through the latest update to a math app's privacy policy to check for changes that might affect students.	• Audit Tools: Regularly review the third-party tools for any changes in their service or privacy policies. • Update Agreements: Ensure that any contracts or agreements with third-party vendors include clauses to protect student data and the right to audit their compliance.
Implement Privacy Protection Features: Implementing privacy protection features involves utilizing the available settings and options within apps and tools to enhance data security. For example, turning on end-to-end encryption in a messaging app used for class communications ensures that messages are secure in transit.	• Privacy Settings: Utilize privacy protection settings within each tool to restrict visibility of student information. • Data Encryption: Choose tools that encrypt data both in transit and at rest.
Monitor and Manage Tool Use: Monitoring and managing tool	• Track Access: Keep logs of who accesses student data and

Strategy and Definition	Ideas for Implementation
use means keeping an eye on how third-party services are used and ensuring they remain a safe environment for students. This could involve periodically checking which websites students can access through the school's library computers.	when. • Control Continuously: Monitor the use of third-party tools and ensure they are only used for their intended educational purpose.
Develop a Response Plan: Developing a response plan is about having a strategy in place to deal with potential privacy issues or data breaches. This might include a step-by-step guide for teachers if they discover a data leak in a student information system, outlining who to contact and what actions to take immediately.	• Plan for Breaches: Have a clear plan in place for responding to any data breaches or unauthorized access incidents. • Communicate Quickly: Establish a protocol for communicating any privacy issues to all stakeholders promptly.

References

US Department of Education. (2014, February 1). *Protecting student privacy while using online educational services: Requirements and best practices*. Protecting Student Privacy.

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8.2.2: Digital Footprints

8.2.2.0.1: Digital Footprint and Reputation



Continuing our quest to help our learners stay safe online, we need to understand what a digital footprint is, and how we can help our learners maintain a good digital footprint. The concept of a digital footprint and reputation is increasingly relevant in the interconnected, online world. A digital footprint, by definition, is the trail of data that individuals leave behind as they use the internet. This can include a wide array of information such as social media posts, comments made on various websites, search history, and even the digital records of online purchases. The significance of one's digital footprint is amplified by its long-lasting nature and the ease with which it can be accessed and analyzed by others, including future employers, marketers, and even cyber criminals.

Consider a scenario where a job candidate's social media history is scrutinized by potential employers. Posts, comments, likes, and shares all paint a picture of the candidate's personality, beliefs, and behaviors. Similarly, one's online activities, like search queries and website visits, can be used for targeted advertising, often without the individual's explicit consent.

For educators, addressing the implications of digital footprints and online reputations is crucial in preparing students for a responsible digital presence.

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Here are some strategies that can be employed:

- **Educating About Digital Footprints:** Instructors should educate students about what a digital footprint is and how it is created. This includes discussions about different types of digital footprints - active and passive - and how they can impact one's future (McDermott, 2018).
- **Promoting Thoughtful Online Behavior:** Encouraging students to think critically before posting or sharing anything online is vital. This includes understanding that once something is shared on the internet, it can be difficult or impossible to erase (McDermott, 2018).
- **Teaching Privacy Management:** Educators should guide students on how to manage privacy settings across various platforms to control what they share and with whom (US Dept. of Education, 2023).
- **Encouraging Regular Audits of Digital Footprints:** Students can be taught to conduct regular audits of their online presence, checking social media profiles, and search engine results about themselves to understand what information is publicly available (Higgin, 2022).
- **Addressing Online Reputation Management:** This involves teaching students how to positively build and maintain their online reputation, such as creating content that reflects their professional interests and achievements (Higgin, 2022).
- **Understanding the Consequences:** Educators should discuss real-life scenarios where digital footprints have had significant consequences, such as job loss or public backlash, to underline the importance of a positive digital presence (Higgin, 2022).
- **Highlighting the Role of Digital Citizenship:** Emphasizing the concept of digital citizenship can help students understand their responsibilities in the online world, including respect for others' privacy and reputations (American University, 2022). In the next page, we will discuss some strategies for encouraging digital citizenship.

Reference

American University. (2022, October 26). [Promoting digital citizenship for students](#). School of Education Online.

Higgin, T. (2022, September 16). [Keeping your students \(and yourself\) safe on social media: A checklist](#). Common Sense Education.

McDermott, M. (2018). Digital Footprints: Creation, Implication, and Higher Education. *Distance Learning*, 15(1), 51-54.

US Department of Education (2023). [Protecting Student Privacy](#).

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8.3: Ethical Issues Related to Internet Usage and AI in Education

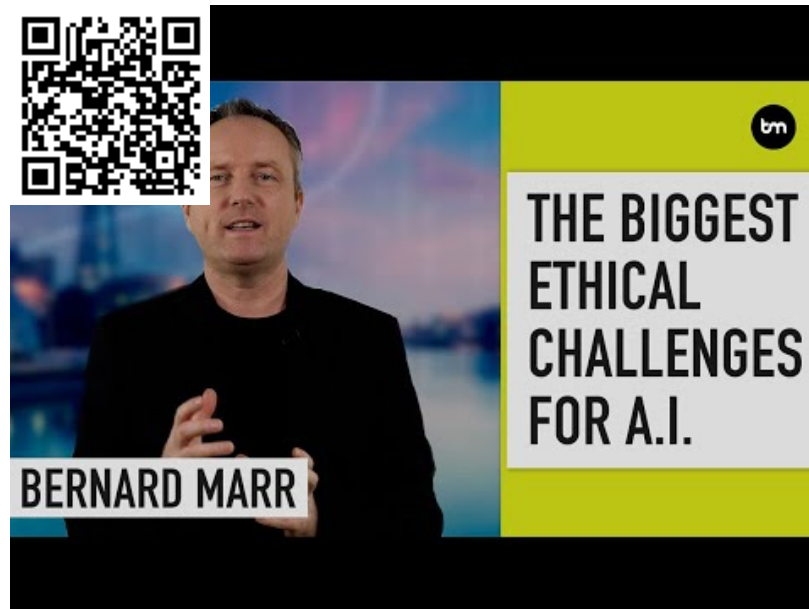
Section Learning Objectives

- Identify ethical issues related to internet and AI usage in educational settings.
- Identify strategies for creating ethical digital citizens in educational settings.

Ethical Considerations

As the world becomes more digital, understanding and following internet ethics is extremely important. Internet ethics is basically the code of responsible behavior for our online interactions and activities. This concept covers a wide range, from how we communicate with others to how we share content and protect personal data. In a time when our online presence matters as much as our physical one, these ethical considerations are key to upholding values like integrity, respect, and security. Grasping the essence of internet ethics is not just about knowing what to do and avoid. It's about creating a safe and respectful digital environment for everyone.

As we have discussed in earlier chapters, AI is a topic that is now becoming integrated in educational technology. As someone who will be or is already working in an educational setting, you will want to be aware of some of the ethical considerations in AI. Although, the following video is a couple of years old, however the concepts are relevant today. Bias, Privacy, Control, Power Balance, Intellectual Property, and Environmental Impact.



The biggest ethical challenges for Artificial Intelligence (2021). [Video: 10:41.]

Privacy and Data Security

As we discussed before, privacy and data security are very important, especially in education. Today's connected world has risks like identity theft, unauthorized data collection, and hacking. We don't want students exposed to these risks in our teaching.

Imagine a student innocently shares personal details online while researching for a class presentation. This could lead to serious privacy breaches. Educators play a key role in addressing these challenges. They can teach students the importance of maintaining digital privacy. For example, they can build lessons on safe online practices into their curriculum.

Strategies like holding workshops on spotting phishing attempts, advising against using unsecured Wi-Fi for sensitive activities, and promoting awareness of long-term digital footprints can be very effective. By empowering students with knowledge and tools to protect their online privacy and data, educators can create a safer digital environment.

Cyber Bullying and Harassment

As educators, one of our goals is to keep students safe online. Students can encounter cyberbullying and harassment. We want to be aware of these issues. Cyberbullying and harassment are a growing problem in the digital world. They involve using electronic communication to intimidate, threaten, or humiliate people. Examples include sending threatening emails, spreading rumors online, or posting harmful content about someone on social media. The effects of cyberbullying can be serious and long-lasting, hurting people's mental health and wellbeing. One common situation is when students are targeted by peers on social media. This could involve posting rude comments, sending abusive messages, or creating fake profiles to damage reputations.

Addressing cyber bullying and harassment requires a multifaceted approach, especially in educational settings. Instructors can play a pivotal role in combating this issue through several strategies (ASPA, 2021):

- **Education and Awareness:** Educators should inform students about what constitutes cyber bullying and the severe impact it can have on individuals. This can be achieved through dedicated sessions, workshops, or integrating the topic into the curriculum.
- **Creating a Supportive Environment:** Schools and educational institutions should foster a culture where students feel safe to report instances of cyber bullying. This involves establishing clear reporting mechanisms and ensuring that reports are taken seriously and handled sensitively.
- **Implementing Policies:** Developing and enforcing a comprehensive anti-bullying policy can serve as a deterrent and provide clear guidelines on the consequences of engaging in such behavior.
- **Encouraging Positive Online Behavior:** Instructors can lead by example and encourage positive interactions online. They can also recognize and highlight instances where students use social media and other digital platforms in a respectful and constructive manner.
- **Empowering Bystanders:** Often, bystanders can play a crucial role in stopping cyber bullying. Educators can train students to recognize cyber bullying and empower them to stand up against it, whether by supporting the victim or reporting the behavior.
- **Providing Support to Cyber Bullying Victims:** It's essential to offer support and share counseling resources to victims of cyber bullying, helping them cope with the emotional stress and trauma it can cause.

References

American University. (2022, October 26). [Promoting digital citizenship for students](#). School of Education Online.

Marr, B. (2021, August 16). *The biggest ethical challenges for Artificial Intelligence*. YouTube.

Assistant Secretary for Public Affairs (ASPA). (2021, November 10). [Prevent cyberbullying](#). StopBullying.gov. US Department of Health and Human Services.

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8.3.1: Creating Ethical Digital Citizens

Fostering Ethical Digital Citizens

Fostering ethical digital citizens within educational settings is a multifaceted endeavor that requires a strategic approach. The following short video is written to a student audience. It provides some good context to helping you fostering ethical digital citizens in your own educational settings.



Digital Citizenship | Things Explained [Video: 4:40 min. Closed Captioned].

Here are some objectives/goals and effective strategies educators can employ to nurture responsible and ethical behavior online

Incorporating Digital Citizenship Curriculum

Our goal is not just to teach students basics of using technology. More importantly, we want to give them a deep understanding of and respect for critical areas like privacy, intellectual property, and appropriate online behavior. Privacy online is complex and extremely important. Students need to learn the value of their personal information and how to protect it.

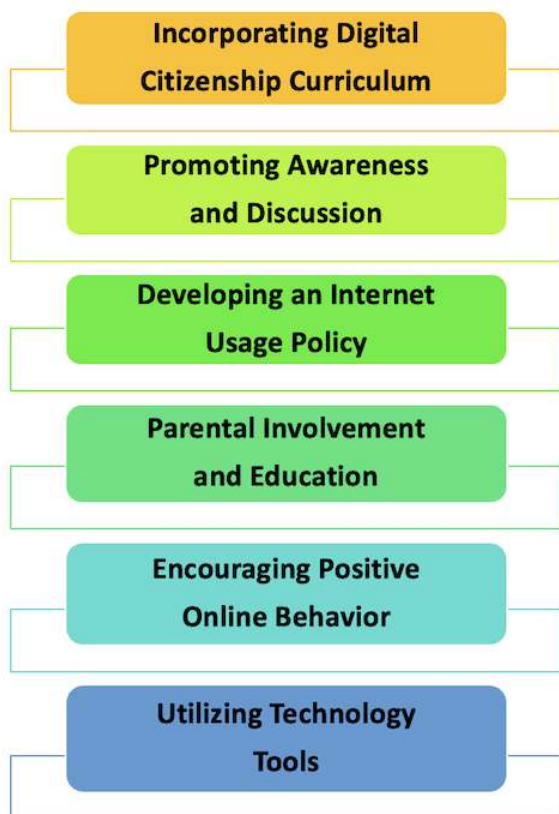
Educating students on these topics requires a multifaceted approach. It's not just theoretical instruction but also real-world application. We need to create a culture of digital literacy and ethical internet use that students carry with them outside the classroom, into everyday life. This education is to safeguard them now and prepare them to be responsible digital citizens as the world becomes even more interconnected.

For example, a social studies class could discuss the societal impact of digital footprints, while a computer class could delve into the technical aspects of internet security and privacy.

Promoting Awareness and Discussion

The goal of raising awareness and discussion here is to stimulate critical thinking. Understanding complex digital ethics is not just about dos and don'ts. It's about seriously considering how our online actions and choices affect things. This approach pushes us to reflect on how we use the internet and interact with others. It helps build a more thoughtful, responsible online community. Whether it's privacy, data security, or complex online communication, opening a dialogue on these topics is key for developing a more ethically-aware online presence.

For example, we can organize discussions, debates, and workshops on relevant topics. Topics might include privacy rights, the impacts of cyberbullying, and understanding disparities in internet access. These types of forums can be very helpful for making students aware of the complexities around digital interactions.



Developing an Internet Usage Policy

The development of a school-wide internet usage policy is a crucial step for educational institutions aiming to foster a safe and responsible digital environment. This initiative is about more than just setting rules; it's about creating a framework that supports ethical online behavior, protects students and staff, and ensures a positive and productive digital experience for all. By establishing and enforcing these guidelines, schools can effectively manage the complexities of internet usage, promoting a culture of respect, safety, and responsibility in their digital interactions.

For example, we can work with teachers, administrators, and students to create a complete internet usage policy. This policy should define the rules for online behavior. It should also spell out what happens if someone breaks the rules. Having a clear, structured policy in place helps make the digital environment more secure.

Figure 8.3.1 Digital Citizenship Strategies by Renee Albrecht CC BY.

Parental Involvement and Education

Getting parents involved in teaching ethical digital citizenship is key. It expands the learning from the classroom into the home. Parents play a big role in reinforcing and complementing the principles taught at school. By including families in this dialogue, educators can take a more comprehensive approach to building responsible digital citizens.

That way, lessons on internet use and ethics are consistently reinforced both at school and home. This community-wide effort creates a stronger foundation for nurturing informed and conscientious digital users.

For example, we can engage parents through meetings and by distributing informational resources. Educating parents about internet safety and ethics reinforces what is taught in school. It promotes a steady approach to digital citizenship between school and home.

Encouraging Positive Online Behavior

Fostering a culture of positive online conduct is important in developing ethical digital citizenship, particularly among students. This initiative aims to promote values of respect, kindness, and constructive interaction within the digital space. By establishing an environment where positive digital interactions are standard, educators and parents play a crucial role in developing a more empathetic and supportive online community. This approach not only combats issues such as cyberbullying and digital misconduct but also advances a comprehensive understanding of responsible digital citizenship, thereby contributing to a healthier and more respectful online environment.

For example, acknowledging and rewarding examples of commendable digital citizenship. This could include recognizing students who use social media to advocate for social causes or those who provide support to peers facing online challenges.

Utilizing Technology Tools

Using technology tools is another strategy to help students use the internet responsibly and ethically. These tools can do things like block content that's not suitable for students or teach them about staying safe and private on the internet. By bringing these kinds of technology into classrooms, teachers can give students real-life examples of how to be smart and ethical while they're online.

For example, implementing software tools for monitoring internet use, filtering inappropriate content, and enhancing digital literacy skills. These tools can provide practical experience in navigating the digital landscape safely and responsibly.

References

GCP Education. (2021, July 30). *Digital Citizenship: Things explained*. YouTube.

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8.4: Copyright and its Impact on Education

Section Learning Objectives

- Identify basic copyright requirements in an educational setting.
- Identify basic copyright compliance solutions in an educational setting.

Introduction to Copyright in Education

Most people have heard the term copyright, and know that it has something to do with not using another's work without permission. It's a bit more complicated than that, but we will keep it pretty high level here. Copyright is a legal concept that grants creators of original works exclusive rights to their works. This includes the right to copy, distribute, display, perform, and create derivative works based on the original. Copyright is intended to protect the intellectual property of creators, such as authors, musicians, photographers, and filmmakers, encouraging the production of a wide variety of creative works (US Copyright Office). As educators, sometimes you can and sometimes you cannot use copyrighted materials in your teaching and learning. The following short educator's introduction to copyright video helps set the stage for this topic.



Creativity, Copyright and Fair Use. [Video: 4:40 minutes. Closed Captioned.]

We won't dig too deep, but there are provisions that will allow educators to use copyrighted material in specific circumstances. These are called "copyright exceptions." That means, that in some very specific circumstances, you may be able to use copyrighted material in your teaching. The following list and brief descriptions are meant to provide you with a basic introduction. As an educator, taking a full course on copyright or another manner of understanding the concepts is important.

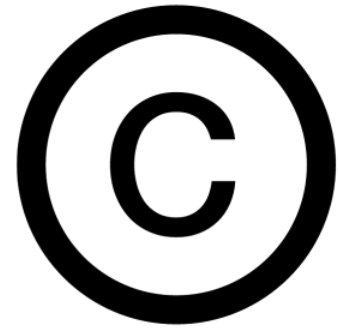
Certainly, educators should be aware of several key copyright exceptions that can apply in educational contexts. These exceptions are designed to balance the rights of copyright holders with the public interest in education and learning. Here's a list of some common exceptions that might be relevant to educators (US Copyright Office, 2022):

- **Fair Use:** This allows limited use of copyrighted material without permission for purposes such as criticism, commentary, news reporting, teaching, scholarship, and research. Factors typically considered include the purpose and character of the use, the nature of the copyrighted work, the amount and substantiality of the portion used, and the effect of the use on the potential market for the copyrighted work. To use the Fair Use exemption, content must be analyzed using identified "four factors" which is beyond the scope of this textbook.
- **Classroom Exemption:** The "classroom exemption," often found in copyright laws, is a specific provision that allows educators to use copyrighted materials in a classroom setting without obtaining permission from the copyright holder. This

exemption is particularly relevant in the context of face-to-face teaching at educational institutions.

- **The TEACH Act:** The TEACH Act, formally known as the "Technology, Education, And Copyright Harmonization Act," was enacted in the United States in 2002 as part of the Copyright Act. Its purpose is to facilitate the use of copyrighted materials in distance education through digital technologies while maintaining the balance between the rights of content owners and the needs of educators and students.

Copyright symbol, US Copyright office, Public Domain



- **Public Domain:** Works that are no longer under copyright protection (because copyright has expired or was never applicable) are in the public domain and can be freely used without permission.
- **Government Works:** Often, works created by government employees as part of their official duties are typically in the public domain and can be used freely. This is not always the case, however, and each document may have specific copyright notices that must be reviewed.
- **Creative Commons Licenses:** Creative Commons licensing refers to a set of public copyright licenses that enable creators to grant permission for others to use their work under specific conditions. These licenses are designed to facilitate the sharing and use of creative works while still providing creators with control over how their works are used.
- **Asking Permission:** Seeking permission from copyright owners is another way to use copyrighted materials responsibly and legally. Most often, this process involves contacting the copyright holder and requesting the right to use their work in a specific way. This typically involves explaining how and where you wish to use the work, and possibly negotiating terms such as duration, payment, or attribution.

This is not an exhaustive list, but provided to share some of the ways that educators can legally use copyrighted materials.

Plagiarism and Copyright

Copyright infringement and plagiarism are related but different. Both involve using someone else's work without permission. But they happen in different contexts and have different results. Copyright infringement violates copyright law. This could be copying, distributing, or remixing creative works without permission. For example, uploading a copyrighted movie online. It is a legal issue with penalties like fines.

Plagiarism is about ethics and academics. It is passing off someone else's work as your own without crediting them properly. This could mean copying parts of a book into an essay without citations. Plagiarism is about integrity. The penalties happen at school or work, like failing an assignment or getting fired.

So copyright infringement is about legal rights and plagiarism is about ethical norms. But both devalue the original creator's hard work and ideas. This shows why properly respecting ownership of creative work matters.

References

Common Sense Education. (2020, September 4). [Creativity, copyright, and fair use](#). YouTube.

U.S. Copyright Office. (2022). [Copyright Law of the United States](#) (Title 17).

US Copyright Office. (n.d.). [What is copyright?](#). What is Copyright? Copyright.gov

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8.4.1: Copyright and Education, Continued.

AI Generated Content and Copyright

In this emerging age of Artificial Intelligence (AI), generating content using AI tools presents unique challenges and opportunities, especially concerning copyright. Educators, content creators, and organizations must navigate these waters carefully. Here are some ways to consider how to address copyright issues when generating content with AI:

- **Understand AI-generated Content Rights:** Firstly, familiarize yourself with the legal standpoint regarding AI-generated content. Generally, AI creates content based on existing data, which might include copyrighted material. The legal framework for AI-generated content is still evolving, so it's crucial to stay informed about the latest developments.
- **Attribute Source Material When Required:** If the AI tool uses source material that requires attribution (like certain Creative Commons licensed works), make sure to provide proper attribution in your generated content. Sometimes you don't know from where the source material came - this can be a challenge when trying to determine copyright considerations.
- **Check for Originality and Infringement:** Before using AI-generated content, especially if it's public-facing or for commercial use, check for potential copyright infringement. Tools like plagiarism checkers can help identify if the AI has reproduced copyrighted material too closely.
- **Develop Policies for AI Use:** Institutions and businesses should develop clear policies for using AI to generate content. These policies should address how to handle copyright issues and ensure compliance with existing laws.
- **Promote Ethical AI Use:** Encourage an ethical approach to AI content generation. This includes respect for intellectual property, transparency about the use of AI-generated content, and consideration of the moral implications of replacing human-created content with AI.
- **Educate and Train:** Ensure that everyone involved in using AI tools for content creation is educated about copyright issues. This includes training on how to use AI responsibly and legally.

And finally, if in doubt, you may want to decide simply not to use the AI generated content.

Proper Citation of Sources: Importance and Guidelines

Let's wrap up this section with a discussion on citing sources and references.

Citing sources in your work is really important for a few reasons, and it's not as complicated as it sounds. First, it's all about giving credit where it's due. Say you use an idea from a book in your project – mentioning the author's name is a way of saying thanks for their hard work. This also keeps you clear of plagiarism, which is when you use someone else's ideas without saying where they came from, and that's not fair or honest. Also, when you back up your points with information from trusted sources, like a well-known study, people are more likely to believe what you're saying. It makes your work look solid and trustworthy. Finally, when you tell people where you got your information, it helps them to find those sources too. This is really helpful for anyone who wants to learn more about the topic or check that the facts are right. So, citing sources is not just a rule – it's a way to show respect, build trust, and help others learn more.

When to Cite Sources

When writing any kind of academic or professional document, or really, any document that others will read, it's important to know when to include citations. Here's a list of some scenarios where you would want to cite your sources:

- **Quoting:** Whenever you directly quote someone else's words, whether it is a sentence or a specific term.
- **Paraphrasing or Summarizing:** When you put someone else's ideas into your own words, a citation is still required because the idea or information originated from another source.
- **Using Data or Research:** When including data, figures, or research findings that are not your own.
- **Referencing a Theory or Model:** When discussing a theory, model, or framework developed by someone else.
- **Images, Videos, Art, and Music:** When using or referring to multimedia elements such as images, videos, or music that were created by others.

In this textbook, we won't be covering how to cite your sources, but encourage you to explore some of the resources at the end of this page for more information.

Practical Tips

- **Use Citation Tools:** Utilize citation generators or bibliographic software like [CitationMachine](#), [Zotero](#), [Grammarly Citation Generator](#), or [Mendeley](#) to help format your citations correctly.
- **Consult Style Guides:** Refer to the specific style guide (APA, MLA, etc.) for detailed instructions, as each style has unique formatting rules.
- **Citation in Drafts:** It's good practice to cite sources even in your drafts to avoid losing track of sources.

Helpful Resources

Some places to review for assistance in creating citations in specific styles:

Citation Guidelines:

- [MLA](#),
 - [Works Cited: A Quick Guide \(MLA\)](#)
- [APA](#)
- [Chicago](#)
- [Turabian](#)

Additional writing resources: [Purdue OWL Writing Lab](#)(opens in new window)

Citation Generators:

- [Citation Machine](#)
- [Zotero](#)
- [Grammarly Citation Generator](#)
- [Mendeley](#)

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8.5: Safe and Healthy Uses of Technology Resources

Section Learning Objectives

- Identify some potential health issues as it relates to the use of technology.
- Identify strategies for promoting the safe and healthy use of technology.

In this section, we will share some general information and strategies for addressing safe and health uses of technology in teaching and learning. While these strategies are written with learners in mind, as a technology user, you should consider the strategies for yourself as well. None of this information should be considered medical or mental health advice; it is informational only. You should always reach out and defer to medical and mental health professionals before developing your teaching and learning strategies as it pertains to health and wellness.

Potential Health Issues Related to Technology Use

The use of technology in educational settings, while beneficial, can also lead to several health concerns if not managed properly. Key health issues include (Johnson, 2023):

- **Eye Strain and Vision Problems:** Prolonged exposure to screens can cause digital eye strain, characterized by dry eyes, blurred vision, and headaches. This is often due to poor lighting, screen glare, and not taking regular breaks from the screen.
- **Musculoskeletal Problems:** Poor ergonomics while using technology can lead to musculoskeletal problems, including back and neck pain. These issues arise from improper seating, screen height, and keyboard placement.
- **Repetitive Strain Injuries (RSI):** Repetitive motions such as typing and using a mouse can lead to RSI, causing pain and discomfort in the hands, wrists, and arms.
- **Hearing Damage:** Using headphones or earbuds at high volumes for extended periods can cause hearing issues, including tinnitus and hearing loss.
- **Mental Health Concerns:** Excessive use of technology can impact mental health, leading to issues like anxiety, depression, and disrupted sleep patterns, particularly due to blue light exposure from screens. Your organization's counselors and mental health professionals can help you to understand these issues better. Reach out to them for more information.

Promoting Safe and Healthy Technology Use

As stated above, you should always reach out and defer to medical and mental health professionals before developing your teaching and learning strategies as it pertains to health and wellness. The following is provided as general information:

- **Ergonomic Awareness:** Ensure ergonomic workstations for technology use. This includes adjustable chairs, proper screen placement, and footrests if necessary (Marcin, 2017).
- **Regular Breaks:** Follow the 20-20-20 rule. Every 20 minutes, look at something 20 feet away for 20 seconds. Encourage students to take short breaks from screen time (Marcin, 2017).
- **Proper Lighting:** Use devices in well-lit areas to reduce eye strain. Avoid glare on screens (Marcin, 2017)..
- **Safe Listening Practices:** Educate about safe headphone volumes. Encourage the use of noise-limiting headphones, especially for younger students (Marcin, 2017)..
- **Encourage Physical Activity:** Integrate physical activities into the learning process to counteract prolonged sitting (Marcin, 2017)..
- **Mental Health Awareness:** Be aware of the signs of technology-related mental health issues. Encourage digital detox periods and promote a balance between technology use and other activities. As stated above, reach out to your organization's counselors and mental health professionals to help you develop strategies (Marcin, 2017).
- **Repetitive Strain Injury (RSI) Prevention:** Teach proper typing techniques and consider using ergonomic keyboards and mouse devices to reduce the risk of RSI (Marcin, 2017).

References

Johnson, J. (2023, April). [Negative effects of technology: Psychological, social, and health](#). Medical News Today.

Marcin, A. (2017b, February 4). [20-20-20 rule: Does it help prevent digital eye strain?](#). Healthline.

Pinola, M. (2020, May 14). [7 things you need for an ergonomically correct workstation](#). The New York Times.

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8.6: Chapter Summary and Knowledge Check

Chapter 8 Summary



In this chapter, you have navigated the critical landscape of digital security in educational settings, recognizing the growing importance of understanding and combating computer viruses and malicious software. As schools become more intertwined with technology, they face heightened vulnerabilities to digital threats. You explored the intricacies of these risks, the crucial role of network security, and the imperative of ethical technology use. This comprehensive examination equips educators, administrators, and students with essential knowledge and tools to safeguard their digital environments. It underscores the responsibility of using technology not just effectively, but also ethically and safely, ensuring that educational institutions can thrive in an increasingly digital world while protecting their digital assets and maintaining the integrity of their educational processes.

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Check Yourself

Review the following questions to self-check your knowledge on the content in this chapter. The answers can be found at the bottom of this page.

Question 1: What is the primary purpose of copyright? a) To limit the creation of new works b) To provide exclusive rights to creators for their works c) To prevent the use of digital media d) To promote government control over artistic works.

Question 2: What is the primary purpose of educational technology in schools? A) To replace traditional teaching methods completely B) To enhance teaching and learning experiences C) To entertain students D) To store student records

Question 3: Which law requires schools to obtain parental consent before disclosing a student's education records? A) The Patriot Act B) The Children's Online Privacy Protection Act (COPPA) C) The General Data Protection Regulation (GDPR) D) The Family Educational Rights and Privacy Act (FERPA)

Question 4: When vetting third-party tools for classroom use, what is a crucial privacy compliance to check for? A) The color scheme compliance with the school's branding B) The tool's alignment with educational standards and legal privacy requirements C) The number of features the tool offers D) The popularity of the tool among students

Question 5: What is a significant risk when educational institutions rely heavily on technology? A) Decreased use of textbooks B) Increased vulnerability to security threats C) Over-reliance on PowerPoint presentations D) Students becoming too familiar with technology

Question 6: In the context of copyright in education, what does "public domain" refer to? A) Materials that are available in public libraries B) Government-owned educational materials C) Works no longer under copyright protection and free to use D) Any content published on the internet

Question 7: What is a significant aspect of Creative Commons licensing? A) It offers a set of public copyright licenses for creators B) It prevents any kind of reproduction of works C) It is only applicable to digital content D) It automatically applies to all new works

Question 8: Which of the following should be included in a response plan for data breaches in schools? A) A clear plan for responding to incidents B) A marketing strategy to promote the school C) A detailed record of all the textbooks in use D) An alternative teaching method without technology

Question 9: Which of the following is a recommended strategy to reduce the risk of digital eye strain? A) Increase the brightness of your screen to the maximum. B) Sit closer to the screen for better visibility. C) Follow the 20-20-20 rule for taking breaks. D) Use the screen continuously without breaks.

Question 10: Which of the following is an effective strategy for managing one's digital footprint? A) Regularly changing your social media profile picture. B) Conducting regular audits of your online presence. C) Posting frequently on all social media

platforms. D) Using the same password for all online accounts.

Answers: 1:B, 2:B, 3:D, 4:B, 5:B, 6:C, 7:A, 8:A, 9:C, 10:B

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