



PayamNoor University

# **Educational Technology Textbook in English**

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امروز کتابخوانی و علم‌آموزی نه تنها یک وظیفه‌ی ملی، که یک واجب دینی است!

### مقام معظم رهبری

در عصر حاضر یکی از شاخصه‌های ارزیابی رشد، توسعه و پیشرفت فرهنگی هر کشوری میزان تولید کتاب، مطالعه و کتاب‌خوانی مردم آن مرز و بوم است. ایران اسلامی نیز از دیرباز تاکنون با داشتن تمدنی چندهزارساله و مراکز متعدد علمی، فرهنگی، کتابخانه‌های معتبر، علما و دانشمندان بزرگ با آثار ارزشمند تاریخی، سرآمد دولت‌ها و ملت‌های دیگر بوده و در عرصه فرهنگ و تمدن جهانی به‌سان خورشیدی تابناک همچنان می‌درخشد و با فرزندان نیک‌نهاد خویش هنرنمایی می‌کند. چه کسی است که در دنیا با دانشمندان فرزانه و نام‌آور ایرانی همچون ابوعلی سینا، ابوریحان بیرونی، فارابی، خوارزمی و ... همچنین شاعران برجسته‌ای نظیر فردوسی، سعدی، مولوی، حافظ و ... آشنا نباشد و در مقابل عظمت آنها سر تعظیم فرود نیاورد. تمامی این افتخارات ارزشمند، برگرفته از میزان عشق و علاقه فراوان ملت ما به فراگیری علم و دانش از طریق خواندن و مطالعه منابع و کتاب‌های گوناگون است. به شکرانه الهی، تاریخ و گذشته ما، همیشه درخشان و پر بار است. ولی اکنون در این زمینه در چه جایگاهی قرار داریم؟ آمار و ارقام ارائه‌شده از سوی مجامع و سازمان‌های فرهنگی در مورد سرانه مطالعه هر ایرانی، برایمان چندان امیدوارکننده نمی‌باشد.

کتاب، دروازه‌ای به سوی گستره دانش و معرفت است و کتاب خوب، یکی از بهترین ابزارهای کمال بشری است. همه دستاوردهای بشر در سراسر عمر جهان، تا آنجا که قابل کتابت بوده است، در میان دست‌نوشته‌هایی است که انسان‌ها پدید آورده و می‌آورند. در این مجموعه بی‌نظیر، تعالیم الهی، درس‌های پیامبران به بشر، و همچنین علوم مختلفی است که سعادت بشر بدون آگاهی از آنها امکان‌پذیر نیست. کسی که با دنیای زیبا و زندگی‌بخش کتاب ارتباط ندارد بی‌شک از مهم‌ترین دستاورد انسانی و نیز از بیشترین معارف الهی و بشری محروم است. با این دیدگاه، به‌روشنی می‌توان ارزش و مفهوم رمزی عمیق در این حقیقت تاریخی را دریافت که اولین خطاب خداوند متعال به پیامبر گرامی اسلام (ص) این است که «بخوان!» و در اولین سوره‌ای که بر آن فرستاده عظیم‌الشان خداوند، فرود آمده، نام «قلم» به تجلیل یاد

شده است: «إِقْرَأْ وَرَبُّكَ الْأَكْرَمُ. الَّذِي عَلَّمَ بِالْقَلَمِ» در اهمیت عنصر کتاب برای تکامل جامعه انسانی، همین بس که تمامی ادیان آسمانی و رجال بزرگ تاریخ بشری، از طریق کتاب جاودانه مانده‌اند.

دانشگاه پیام‌نور با گستره جغرافیایی ایران شمول خود با هدف آموزش برای همه، همه‌جا و همه‌وقت، به‌عنوان دانشگاهی کتاب‌محور در نظام آموزش عالی کشورمان، افتخار دارد جایگاه اندیشه‌سازی و خردورزی بخش عظیمی از جوانان جویای علم این مرز و بوم باشد. تلاش فراوانی در ایام طولانی فعالیت این دانشگاه انجام پذیرفته تا با بهره‌گیری از تجربه‌های گرانقدر استادان و صاحب‌نظران برجسته کشورمان، کتاب‌ها و منابع آموزشی درسی شاخص و خودآموز تولید شود. در آینده هم، این مهم با هدف ارتقای سطح علمی، روزآمدی و توجه بیشتر به نیازهای مخاطبان دانشگاه پیام‌نور با جدیت ادامه خواهد داشت. به‌طور قطع استفاده از نظرات استادان، صاحب‌نظران و دانشجویان محترم، ما را در انجام این وظیفه مهم و خطیر یاری‌رسان خواهد بود. پیشاپیش از تمامی عزیزانی که با نقد، تصحیح و پیشنهادهای خود ما را در انجام این وظیفه خطیر یاری می‌رسانند، سپاسگزاری می‌نماییم. لازم است از تمامی اندیشمندانی که تاکنون دانشگاه پیام‌نور را منزلگه اندیشه‌سازی خود دانسته و ما را در تولید کتاب و محتوای آموزشی درسی یاری نموده‌اند، صمیمانه قدردانی گردد. موفقیت و بهروزی تمامی دانشجویان و دانش‌پژوهان عزیز آرزوی همیشگی ما است.

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## **Study guide**

In today's rapidly evolving educational landscape, the integration of educational technology and instructional design has become essential to improving teaching and learning experiences. This book aims to provide a comprehensive understanding of how technology can be effectively used in education and how instructional design models can enhance learning outcomes. By combining theory with practical applications, this book offers a valuable resource for educators, instructional designers, and anyone interested in creating engaging and effective learning environments.

## **Goals of the Book**

The primary goal of this book is to introduce the foundational concepts and principles of educational technology and instructional design. It strives to provide readers with the necessary tools to design, implement, and assess effective educational programs that cater to diverse learning needs. By exploring various instructional design models and how they intersect with technology, this book prepares readers to create impactful learning experiences that engage and motivate students.

The book also emphasizes the importance of maintaining learner motivation throughout the educational process, offering tools like Keller's ARCS model to keep students engaged, especially in digital or online learning environments. By integrating technology into instructional design, this book aims to foster deeper learning, active participation, and better overall performance.

## **Exercises and Activities**

Throughout the book, readers will find a variety of exercises and activities designed to help reinforce the concepts covered in each lesson. These exercises include discussion questions, case studies, multiple-choice questions, hands-on activities, and reflective practice tasks that encourage readers to apply what they have learned to real-world teaching scenarios.

Each lesson concludes with activities designed to assess understanding and apply theoretical knowledge in practice. These include individual and group activities, allowing readers to engage deeply with the material and gain practical experience in educational design and technology integration.

## **Conclusion**

This book is designed as a practical guide for educators, instructional designers, and technology specialists who wish to improve their understanding of how to effectively integrate technology into teaching. It provides a clear, structured approach to instructional design, with numerous examples and activities to support learning. Whether you're a beginner in instructional design or a seasoned educator looking to refresh your skills, this book will equip you with the knowledge and tools to create meaningful, engaging, and effective educational experiences.

# Lesson 1

## Educational Technology

### General Aims of the Lesson

This lesson introduces the concept of educational technology, its applications in teaching, and the role of tools like examples and non-examples in enhancing learning. It discusses the interdisciplinary nature of educational technology and its connection to cognitive psychology. Furthermore, the lesson explores how digital tools, such as interactive technologies and collaborative projects, enhance learning experiences and critical thinking skills.

### Behavioral Objectives

After completing this lesson, students will be able to:

1. Define key vocabulary words related to educational technology such as "cognitive," "dynamic," and "interdisciplinary."
2. Identify examples of tools used in educational technology and describe how they enhance learning.
3. Explain the importance of using examples and non-examples in teaching to clarify concepts and foster critical thinking.
4. Discuss how the interdisciplinary nature of educational technology influences teaching methods.
5. Analyze the cognitive aspects of educational technology and its role in improving learning outcomes.
6. Recognize the importance of utilizing a variety of methods and tools to tackle challenges in educational technology.

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7. Translate a passage about learning innovations and educational technology into smooth Persian to reinforce comprehension and vocabulary.
8. Discuss how digital learning environments foster student engagement and collaboration.

### Vocabulary

**Approach** /ə'prəʊtʃ/ A way of doing something or dealing with a problem.

**Crucial** /'kru:ʃəl/ Extremely important or necessary for success.

**Enhance** /ɪn'hæns.ɪŋ/ Improving or increasing the quality, value, or performance of something.

**Holistic** /hoʊ'li:stɪk/ Considering everything as a whole, not just individual parts.

**Integral** /'ɪn.tɪ.grəl/ Being an essential or necessary part of something.

**Intersection** /'ɪn.tɪ.sɛk.ʃən/ A point where two or more things meet or overlap.

**Nutrition** /nu:'tri:ʃ.ən/ The study of food and how it affects health and growth.

**Perspective** /pɪ'spek.tɪvz/ Different ways of looking at or thinking about something.

**Reveal** /rɪ'vi:lz/ Makes something known or visible that was hidden or unknown.

**Tutorial** /'tu:tɔ:r.i.əlz/ Guides or lessons that help you learn a skill or subject.

### Pre reading exercise

Discuss your answer to the following questions in the classroom.

1. What is the role of examples and non-examples in teaching concepts, and how do they help deepen understanding?
2. How does educational technology combine principles from education and technology to improve learning and performance?
3. Why is a systematic and interdisciplinary approach important in solving problems within educational technology?

## Passage

### Educational Technology

Educational technology is an integral part of modern education, enhancing learning through the strategic use of various technologies. A common teaching method involves using examples, defining rules, and discussing non-examples to clarify concepts. For instance, to teach the concept of "fruit," a teacher might present a banana, an orange, and an apple, and ask questions like "Where are the seeds in a banana?" This approach fosters critical thinking and deepens understanding, as emphasized by Dewey (1907, 1916). By engaging students in analyzing examples, educators encourage them to explore the underlying principles of a concept, moving beyond rote memorization to meaningful comprehension.

Non-examples, such as nuts and potatoes, can further broaden the lesson to cover multiple concepts, including fruits, vegetables, and nutrition. This technique not only clarifies the boundaries of a concept but also helps students make connections across different topics. Mastering the language of educational technology is essential for professionals in the field, as it enables them to effectively communicate and implement innovative teaching strategies. The learning technique of using examples, non-examples, categorizing rules, and practice reveals various tools in educational technology, such as computer tutorials, interactive whiteboards, online discussion forums, graphing software, and historical databases. These tools provide diverse ways to engage students and enhance their learning experiences.

Exploring non-examples can significantly enrich classroom learning, but effective concept acquisition requires more than just presenting examples and rules. Practice and timely feedback are crucial to ensure that students internalize the concepts correctly. Without these elements, merely stating rules may lead to misconceptions, as highlighted by Gagné (1985) and Gagné & Merrill (1990). Educational technology plays a vital role in providing opportunities for practice and feedback, enabling students to refine their understanding and apply their knowledge in various contexts. This iterative process of learning, practicing, and receiving feedback is essential for deep and lasting comprehension.

Educational technology can be defined as the intersection of education and technology, where the disciplined application of knowledge is used to improve learning, instruction, and performance. A clear definition by Spector (2014a, 2014b) states that educational technology reflects the engineering principles that guide educational technologists. This

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interdisciplinary field emphasizes understanding problems before seeking solutions, rooted in cognitive psychology. A systematic approach is crucial, considering the long-term view, holistic view, and dynamic view of the problem space, as noted by van Merriënboer (1997). By adopting a structured and thoughtful approach, educational technologists can develop effective solutions that address the complexities of learning and instruction.

Educational technology encompasses a wide range of disciplines, activities, people, tools, and opportunities for meaningful change. Principles from diverse areas, such as psychology, computer science, and instructional design, guide educational technologists in their work. Numerous tools have been developed to support their efforts, including learning management systems, virtual reality platforms, and adaptive learning technologies. These tools enable educators to create personalized and engaging learning experiences that cater to the unique needs of each student. The field of educational technology is constantly evolving, driven by advancements in technology and a deeper understanding of how people learn.

A conceptual model of educational technology illustrates its components, focusing on the knowledge within the field rather than the practitioners or methods of knowledge application. This model highlights the importance of integrating theory and practice, ensuring that technological solutions are grounded in sound educational principles. Educational technologists approach their work from multiple disciplines and perspectives, recognizing that enhancing learning and performance through technology is not a formulaic process. Instead, it requires creativity, adaptability, and a willingness to experiment with new ideas and tools.

Diverse methods and tools are available to tackle the complex challenges faced in the field of educational technology. From gamification and simulations to data analytics and artificial intelligence, these innovations offer exciting possibilities for transforming education. However, the successful implementation of these tools depends on a deep understanding of the educational context and the needs of learners. Educational technologists must continuously evaluate the effectiveness of their solutions and make adjustments as needed to ensure that they are meeting their goals.

In conclusion, educational technology is a dynamic and interdisciplinary field that plays a crucial role in enhancing learning and instruction. By leveraging examples, non-examples, and systematic approaches, educators can create engaging and effective learning experiences. The integration of technology into education offers numerous opportunities for innovation, but it also requires careful planning and a commitment to understanding the complexities of learning. As the field continues to evolve, educational technologists will play a vital role in shaping the future of education,

ensuring that students are equipped with the knowledge and skills they need to succeed in an increasingly digital world.

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## Post reading exercises

**A: Recalling information. Decide if the following sentences are true or false.**

1. Educational technology only focuses on the use of computers and software.
2. Using non-examples in teaching can help broaden students' understanding of concepts.
3. Educational technology is defined as the intersection of education and technology.
4. A systematic approach in educational technology is unnecessary for solving complex problems.

**B: Answer the following questions.**

1. What is the role of examples and non-examples in teaching concepts?
2. How does educational technology improve learning and performance?
3. Why is a systematic approach important in educational technology?
4. Name two tools used in educational technology and briefly explain their purpose.

**C: Multiple Choice Questions**

Read each question carefully and choose the best answer from the provided options (a, b, c, or d).

- 1. What is the primary goal of educational technology?**
  - a) To replace teachers with technology
  - b) To improve learning, instruction, and performance
  - c) To focus solely on computer programming
  - d) To eliminate traditional teaching methods
- 2. Which of the following is a key component of educational technology?**
  - a) Memorizing rules without practice
  - b) Using interdisciplinary principles and tools
  - c) Avoiding the use of examples and non-examples
  - d) Focusing only on theoretical knowledge
- 3. What does a systematic approach in educational technology emphasize?**
  - a) Ignoring long-term solutions
  - b) Focusing only on immediate results
  - c) Considering long-term, holistic, and dynamic views
  - d) Avoiding interdisciplinary methods
- 4. Which of the following is an example of a tool used in educational technology?**
  - a) A traditional chalkboard
  - b) An interactive whiteboard
  - c) A printed textbook
  - d) A handwritten notebook

## Vocabulary practice

**A: Match the words with their definitions.**

WORDS	DEFINITIONS
<b>1. Acquisition</b>	a) A detailed lesson or guide designed to teach a specific skill or topic.
<b>2. Crucial</b>	b) The process of obtaining or gaining something, such as knowledge or assets.
<b>3. Enhance</b>	c) The point where two or more things meet or overlap.
<b>4. Holistic</b>	d) To make something better or improve its quality.
<b>5. Integral</b>	e) A particular way of viewing something, influenced by personal experiences.
<b>6. Intersection</b>	f) Extremely important or necessary for success.
<b>7. Nutrition</b>	g) The process of providing or obtaining the food necessary for health.
<b>8. Perspective</b>	h) To show or make something known that was previously hidden or secret.
<b>9. Reveal</b>	i) Considering the whole system or person, rather than just individual parts.
<b>10. Tutorial</b>	j) Being an essential part of something; necessary to complete the whole.

**B: Put these words in the sentences (one extra word).**

**perspective – enhance – crucial – guide -holistic – intersection – tutorial – nutrition – reveal – acquisition – integral**

1. A balanced diet rich in \_\_\_\_\_ is essential for maintaining energy levels and overall health.
2. The new café is located at the \_\_\_\_\_ of Main Street and 5th Avenue, making it a popular spot for locals.
3. The scientist's research aims to \_\_\_\_\_ the hidden effects of climate change on marine life.
4. The doctor recommended a \_\_\_\_\_ approach to health, focusing on both physical and mental well-being.

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5. Before starting the project, I watched a \_\_\_\_\_ on how to use the new design software.
6. Teamwork is \_\_\_\_\_ to the success of any group project, as it encourages collaboration and shared responsibility.
7. The company announced the \_\_\_\_\_ of a smaller tech startup to expand its market reach and improve its product offerings.
8. Traveling to different countries can give you a new \_\_\_\_\_ on life and help you appreciate cultural diversity.
9. Adding fresh herbs to the dish can \_\_\_\_\_ its flavor and make it more enjoyable.
10. Time management is \_\_\_\_\_ for students who want to balance their studies and extracurricular activities.

**C: Parts of speech. Fill in the blank with the appropriate forms of the words given below.**

Word	Noun	Verb	Adjective	Adverb
<b>Integral</b>	integration	integrate	Integral	integrally
<b>Clarify</b>	clarification	clarify	Clear	clearly
<b>Multiple</b>	multiplicity	multiply	multiple	multiply
<b>Interactive</b>	interaction	interact	interactive	interactively
<b>Application</b>	application	apply	applicable	applicably
<b>Solution</b>	solution	solve	solvable	-

### **Integral**

1. The new software is an \_\_\_\_\_ part of the company's digital transformation strategy.
2. The team worked hard to \_\_\_\_\_ the new system with the existing infrastructure.
3. The \_\_\_\_\_ of different departments improved overall efficiency.

### **Clarify**

1. The teacher asked the student to \_\_\_\_\_ their answer so everyone could understand.

2. After the meeting, the manager provided a \_\_\_\_\_ of the new policy.
3. Her explanation was very \_\_\_\_\_, and everyone understood the instructions.

### Multiple

1. The problem has \_\_\_\_\_ solutions, so we need to choose the best one.
2. The company decided to \_\_\_\_\_ its production capacity to meet increasing demand.
3. The \_\_\_\_\_ of options made it difficult to decide which product to buy.

### Interactive

1. The museum's \_\_\_\_\_ exhibits allowed visitors to engage with the displays.
2. The students were encouraged to \_\_\_\_\_ with each other during group activities.
3. The \_\_\_\_\_ between the team members led to a successful project outcome.

### Application

1. She submitted her \_\_\_\_\_ for the job last week and is waiting for a response.
2. The new rules \_\_\_\_\_ to all employees, regardless of their position.
3. The software is not \_\_\_\_\_ in this situation because it doesn't meet our needs.

### Solution

1. The scientist worked tirelessly to \_\_\_\_\_ the complex equation.
2. The \_\_\_\_\_ to the problem was simpler than anyone had expected.
3. This issue is \_\_\_\_\_ if we approach it with the right tools and mindset.

### Elaborated practice

#### A: Translate the following text into smooth Persian.

Technology has become an integral part of modern education, transforming how students learn and teachers instruct. One effective teaching strategy is the use of interactive tools, such as virtual simulations and online quizzes, which engage students and make learning more dynamic. For example, to teach the concept of "ecosystems," a teacher might use a digital simulation to show how plants, animals, and the environment interact.

This method not only clarifies complex ideas but also encourages students to think critically and explore concepts independently. In addition to examples, the use of non-examples can help students distinguish between related ideas. For instance, when teaching "renewable energy," a teacher might contrast solar power (renewable) with coal (non-renewable).

This approach broadens students' understanding and helps them grasp multiple aspects of a topic. However, simply presenting information is not enough; students need opportunities to apply their knowledge through practice and receive timely feedback to avoid misconceptions. Educational technology is not limited to tools like computers and software; it also involves the application of research-based strategies to improve learning outcomes.

#### B: fill in the blank with the following words.

**enhances - multiple - purpose -systematic – revolutionized- crucial - preferences -illustrate- historical - application – interactive- reinforces**

Technology has ..... the way students engage with learning materials, making education more ..... and accessible. For instance, tools like virtual reality (VR) allow students to explore ..... sites or scientific phenomena without leaving the classroom. This hands-on approach not only ..... understanding but also sparks curiosity and creativity.

Teachers can use ..... resources, such as videos, podcasts, and online quizzes, to cater to different learning styles. For example, a video might ..... a complex concept like photosynthesis, while an interactive quiz ..... the material. This variety ensures that all students, regardless of their ....., can benefit from the lesson.

However, the ..... of technology must be thoughtful. Simply using gadgets without a clear ..... can distract students rather than

help them learn. A ..... approach, where technology is integrated with clear learning objectives, is ..... for success.

**C: Put the following paragraphs in the right order to form a text. Write the corresponding letters in the boxes provided.**

**A:** In addition to improving engagement, technology also supports teachers in delivering more effective lessons. Tools like interactive whiteboards and digital textbooks make it easier to present complex ideas in a clear and engaging way. For instance, a biology teacher can use 3D models to illustrate the structure of a cell, making it easier for students to visualize and understand. Online discussion forums allow students to share ideas and ask questions outside of class, promoting a deeper understanding of the material. By integrating these tools, educators can create a more dynamic and inclusive learning environment.

**B:** Despite its many benefits, the use of technology in education also presents challenges. Not all students have equal access to devices and the internet, which can create disparities in learning opportunities. Additionally, the rapid pace of technological change requires teachers to continuously update their skills and adapt their methods. A systematic approach to integrating technology, with a focus on long-term goals, is essential for maximizing its potential. By addressing these challenges, we can ensure that technology serves as a powerful solution for improving education.

**C:** Technology is reshaping the future of education, offering new ways to make learning more interactive and personalized. For example, artificial intelligence (AI) can analyze student data to identify learning gaps and provide customized resources. This approach not only enhances understanding but also allows students to learn at their own pace. Virtual classrooms and online platforms enable students from different parts of the world to collaborate on projects, fostering a global perspective. However, the application of these tools must be carefully planned to ensure they align with educational objectives.

<b>1</b>	<b>2</b>	<b>3</b>