THE IMPACT OF MODERN INFORMATION AND COMMUNICATION TECHNOLOGY ON THE EDUCATION PROCESS: DIGITAL VIDEOS AS A MODEL



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Abstract:

This article investigates the transformative impact of modern information and communication technologies (ICTs) on the educational process, with a particular focus on digital educational videos as a case study. These videos provide flexible and interactive learning experiences that enhance students' comprehension, engagement, and motivation. They also allow educators to diversify instructional approaches and foster more effective interaction with learners. While digital videos offer significant benefits, including accessibility and interactivity, they also present challenges such as high production costs, technical constraints, and the need for specialized teacher training. The study underscores the importance of integrating these technologies into curricula and professional development programs to optimize learning outcomes in the digital era.

Keywords:

Information, Communication, Technology, Digital Videos, Educational Process.

Introduction

The Internet is one of the most significant technological innovations of the modern era. It represents the largest information network and serves as a fundamental global resource that shapes people's lives and daily activities. Its applications span numerous fields, including education, where it has become a primary driver of contemporary trends. The Internet has placed the learner at the center of the educational process, initiating a qualitative shift in educational strategies. Education has evolved from

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limited traditional approaches to advanced, diverse models that incorporate the latest technologies and pedagogical methods, introducing unique dimensions, effects, and programs that enhance learners' experiences and their ability to understand and assimilate knowledge.

These modern methods demand minimal effort from both teachers and learners, enabling learners to achieve educational objectives directly through engagement with the course material. This approach fosters learners' self-directed activity and active participation, particularly through educational digital videos, which have become one of the most prominent and widely adopted methods in contemporary education. Digital videos serve as an effective educational tool, presenting a wide range of topics interactively in ways that static images or texts cannot match. Their flexibility and accessibility allow learners to view them anytime and anywhere, making them more versatile than traditional teaching methods.

Given the influence of modern information and communication technologies—especially digital videos—on the educational process, this article seeks to address several key questions: How do digital videos affect learners' comprehension compared to traditional methods? What role do they play in enhancing teacher-student interaction? How do they contribute to fostering self-directed and interactive learning? Additionally, the article discusses challenges that teachers and learners may encounter when using digital videos and explores strategies to overcome these challenges to maximize the educational benefits of this technology.

First: The concept of the educational process:

The educational process encompasses all activities and procedures carried out by the teacher within the classroom to achieve educational objectives by presenting the content in an organized and sequential manner. As Johnson defines it, the educational process is "a set of elements organized in a way that motivates students to learn and encourages them to do so. Education involves the organization of the educational environment, including classrooms, learners, curricula, materials, resources, and educational competencies, ultimately leading learners to acquire theoretical knowledge, practical skills, or positive attitudes." (حريشي عبد الحافيظ، عمر فازي،.2014.ص85-86)

Second: Media used in the educational process:

2.1 The concept of educational media:

The definition of educational media varies according to different schools of thought regarding technology. They are sometimes referred to

as illustrative media, visual media, audio media, instructional media, or educational technology. Generally, educational media are defined as "the various tools or resources used by teachers in the educational process to clarify complex lesson topics and facilitate learners' understanding and learning efficiently. These media engage the five senses, with particular emphasis on sight and hearing."(أحمد عيسى داود.2014.ص65)

2.1 Types of Educational Media:

1- These media are called visual because they primarily engage the sense of sight as the main source of learning. Early educational scholars emphasized the effectiveness of presenting objects directly to learners so that they can observe and learn concretely, rather than through abstract explanations. Visual educational media include models and specimens, exhibitions and museums, charts, paintings and flashcards, maps, as well as animated and still films."(محمد داود الربيعي.2012.ص327)

2- Audio Educational Media: Audio educational media rely on providing knowledge to learners by engaging and utilizing their sense of hearing. Among the most important audio media are:

✓ **Radio**: Radio is considered one of the most effective tools for enriching learners' knowledge, as it offers continuous daily coverage of numerous curriculum topics and presents current events. Its unique advantage lies in its ability to transcend the limitations of time and space.

✓ **Audio Recordings**: Audio recording involves the preservation and storage of sounds using various devices to capture lectures and create recorded educational materials. Modern devices allow learners to revisit educational content at any time, enhance comprehension through repetition, and support the creation of personalized learning materials. Common devices used include:

a) . **Portable Digital Voice Recorders**:

1- Sony ICD-PX470: A small, portable device for recording lectures or meetings.

Zoom H1n: A professional recorder providing high-quality audio for lectures or interviews.

2. Smartphones: Most modern smartphones feature advanced voice recording applications, such as Otter.ai (automatic transcription and recording), Voice Memos (iPhone), and Google Recorder (Android).

3. Wireless Microphones Connected to Recording Devices: These are used with computers or mobile devices, such as the Blue Yeti (USB), a professional microphone for recording educational audio and podcasts,

and the Rode Wireless GO, ideal for capturing educational videos with clear audio quality.

b) Built-in Audio Recorders in Other Devices:

Laptops and Tablets: Equipped with software such as Audacity or GarageBand for recording and editing audio.

Digital Cameras with Audio Recorders: Used to record educational videos with clear audio, for example, Canon or Sony cameras with external microphones.

a) Collaborative Audio Recording Systems

b) Conference call devices such as the Zoom H6 or Tascam DR-40 allow recording of study groups, discussion panels, workshops, or student group discussions.

c) Recording Devices Integrated into Distance Learning Systems

d) Platforms such as Microsoft Teams, Zoom, and Google Meet provide tools for high-quality lecture recording, enabling virtual lectures to be recorded and shared with students.

✓ **Audio-visual teaching aids**: Audio-visual aids combine sound and image to enhance learning and motivate learners. They create interactive and rich educational environments that facilitate better absorption of information. Television is among the most significant tools for teachers in conveying and presenting content. Its educational role has been reinforced by advances in communication technologies, including satellite communication, computer-based organization and display of information, and video equipment for storing audio-visual content.

Television is used in education through specifically designed, systematic programs aimed at achieving educational goals across various levels. Educational films help present live scenarios or practical experiments, such as science or history documentaries. Additionally, interactive videos—containing embedded questions—enable the integration of multiple educational media within a single video program. These tools allow teachers to control the pace of content delivery, including advancing, pausing, or slowing down the display of images to enhance the learning experience.

Third: Educational digital videos

3.1 The Concept of Digital Educational Videos:

Digital educational video, also known as interactive video, is a technology and tool that provides active, engaging, and interactive educational content. It allows learners to control the presentation of information and respond to stimuli and interaction tools displayed on the

video screen, enabling them to achieve educational objectives in the manner, style, and pace that best suit their needs. Interactive video presents educational content electronically, accompanied by synchronized audio and video, and provides additional tools that allow students to interact with the video, including controlling the display and navigating to any location within the interactive environment (https//: www.new-educ.com.12/02/2024)

Digital educational video combines computer technology and video media, whether on tape or disc, enabling learners to interact with the program in ways that allow them to learn concepts and gain new experiences in educational contexts. The interactive video system typically includes the following devices: a computer, a video device, a display screen, and a device to connect the video to the computer. Interactive video, in its current form, is an effective and vital tool, especially for individualized learning, as it accounts for learners' differences in knowledge levels and the pace at which information is presented.

The interactive video system requires learners to know only how to use a keyboard to interact with the information displayed in the program. Digital educational video is considered one of the innovations in the field of e-learning, providing audio-visual information tailored to learners' responses and abilities. The sound and images are displayed on a screen representing a part of a learning unit. The system often relies on a multi-screen setup to present the various elements of the lesson efficiently (جدي يونس هشام.2017.ص51)

3.2 Characteristics of Educational Digital Videos:

Educational digital videos possess numerous characteristics that distinguish them from other educational tools. Therefore, teachers should be aware of these features to effectively achieve their educational objectives. Key characteristics include:

1- Control over Video Playback: Learners can stop, pause, speed up, or slow down the video. This feature allows learners to interact with the video at their own pace and level of concentration, while also providing flexibility in managing other learning methods during the instructional process.

2- Use of Annotations and Interactive Elements: Learners can add links, clickable questions, and answers within the video, which must be addressed while watching. Additionally, playlists and hyperlinks can be

used to present video clips in a predetermined sequence, enhancing the organization of content.

3- Flexible Synchronization of Audio and Video: This feature enables the structured organization and sequencing of educational content, ensuring clarity and coherence. Video also facilitates the retention and long-term storage of information by tracking learner responses and assessing the achievement of learning objectives.

4- Integration of Video and Computer-Assisted Learning: Interactive video combines the advantages of both video and computer-assisted learning, integrating the strengths of each medium while mitigating the weaknesses of alternative methods.

5- nteractivity: Learners actively engage with the content through responses during the learning process, which promotes sustained participation and positive involvement. The program is designed to accommodate diverse learning styles and response patterns, enhancing learner engagement and effectiveness. فلسطين محمد أحمد) الكسجي.2012.ص107-108)

3.3 Advantages and Disadvantages of Educational Digital Videos:

1- **Advantages of Digital Educational Videos :**

The key advantages of digital educational videos can be summarized as follows:

a) Real-world experiences: They provide learners with practical, real-world experiences, helping them grasp and understand concepts by presenting educational content in an engaging and interactive manner.

b) Motivation and self-learning: Digital videos are a powerful and motivating educational tool that promotes self-directed learning. They allow learners to explore knowledge independently, using videos not as an end but as a means to achieve educational goals.

c) Multisensory engagement: Digital videos address multiple senses simultaneously and cater to different learning styles. They serve as multimedia tools combining diverse and accessible audio-visual content.

d) Flexible production tools: The production of educational videos utilizes a variety of multimedia tools, including cameras, mobile devices, websites, animations, and software applications.

e) Widespread accessibility: The increasing availability of digital video production technology and editing software has made video content widely accessible. Platforms like YouTube host millions of digital

educational videos online.-117ص.2017.مديحة حسن محمد، عبد الرحمن عبد الجواد وآخرون)
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f) Control and review: Digital video players allow teachers and learners to pause, slow down, speed up, and rewind content for careful review and analysis.

g) Rich multimedia content: Educational digital videos often combine still images, narration, music, maps, documents, audio clips, animations (e.g., Flash movies), and screen recordings, creating a rich, engaging learning experience. (Lynn Bell ,Glen L.bull.2010.p02)

2. Disadvantages of Digital Educational Videos:

Despite their many advantages, digital educational videos also have limitations, summarized as follows:

a) High equipment cost: The cost of digital video production and playback equipment, including computers, cameras, and VCRs, can be significant.

b) Technical malfunctions: Frequent technical problems can disrupt the learning process, wasting time and reducing effectiveness.

c) Requirement of expertise: Designing and producing effective digital videos requires technical skills and experience, which some teachers may lack due to reluctance or limited training.

d) Maintaining learner attention: When videos are delivered remotely, it may be difficult for teachers to sustain learners' concentration.

e) Content reliability: Educational videos may sometimes contain inaccurate information, leading to potential misconceptions.

f) Poor visual quality: Low-quality visuals, such as unclear handwriting or poorly scanned documents, can hinder learners' understanding.

g) Bandwidth limitations: Insufficient network bandwidth can result in blurry images, ghosting, or audio interference, disrupting the learning environment..(عادل أحمد الورافي.2017.ص117-118)

Fourth: The Functions of Digital Videos in Developing the Educational Process

Digital videos serve multiple functions that significantly enhance teaching and learning. These functions can be summarized as follows:

4.1 Organizing the Teaching and Learning Process:

Video programs contribute to the technical and professional organization of lessons. Teachers can plan the educational process, define objectives, design activities, and determine evaluation methods. Learners are encouraged to watch the video content, with pauses after each unit for

formative assessment. At the conclusion of the program, overall learning outcomes and the degree of goal achievement are evaluated. In some cases, learners may engage in performance-based tasks, presenting the material to peers and demonstrating their understanding.

4.2 Enhancing Clarity of Information:

Digital videos act as semi-tangible tools that make complex concepts more understandable. They improve learners' comprehension and retention by presenting information in a clear, structured, and visually engaging manner.

4.3 Motivating Learners:

Videos stimulate and motivate learners, fostering positive attitudes toward the subject matter. This encouragement enhances creativity, innovation, and active participation in the learning process.

4.4 Supporting Effective Learning

Digital videos provide diverse stimuli that facilitate effective learning. They allow learners to respond, reflect, and receive feedback, promoting a deeper understanding of the material.

4.5 Linking Theory with Practice:

One essential function of educational videos is their ability to connect theoretical concepts with practical applications. Videos allow learners to observe and analyze applied processes, bridging the gap between abstract knowledge and real-world experience.

4.6 Providing New Knowledge and Consolidating Skills :

Video programs are an important source of new information. They also help reinforce previously acquired knowledge, skills, and attitudes, ensuring that learners can effectively apply what they have learned in practical contexts.

4.7 Promoting the Democratization of Education :

By making educational videos widely available, all learners gain equitable access to high-quality educational resources. This supports the principle of educational democratization, allowing learners from diverse backgrounds to benefit equally from the curriculum.

Fifth: Educational Benefits of Digital Educational Videos

5.1 Benefits for Learners :

1- Enhanced Connectivity: Videos help learners maintain attention and place them at the center of the educational process by boosting motivation, experience, and communication skills.

2- Exploration: Interactive videos allow learners to explore educational content independently, fostering curiosity and deeper engagement.
3- Encouragement Self-Confidence: By providing opportunities for learners to study according to their own abilities and pace, digital videos help increase self-confidence.
4- Flexible Learning: Learners can access video content anytime and from any location, supporting personalized learning schedules.
5- Increased Opportunities for Self-Learning: With the vast resources available online, learners can independently expand their knowledge and skills.

5.2 Benefits for Teachers:

Teachers also gain significant advantages from using digital videos in education:
1- Improved Teaching Efficiency: Videos equip teachers with enhanced teaching skills, especially when integrated into structured training programs.
2- Opportunities for Self-Development: Teachers can explore new teaching methods and refine their instructional practices.
3- of Innovation: Videos foster creative and innovative teaching approaches.

4-Enhanced Interaction: Digital videos create new forms of interaction between learners, and between learners and educational content.

5.3 Benefits for the Learning Environment:

Digital educational videos contribute to a richer and more dynamic learning environment:
1- Visual Analysis: Videos enable learners to slow down or speed up motion, pause at specific moments, and observe processes according to their individual needs. Computers facilitate this principle to maximize educational outcomes.
2- Utilization of Information and Energy: Digital videos help generate new knowledge and potential by linking information with interactive learning experiences.
3- Auditory and Multisensory Learning: Videos strengthen auditory comprehension by linking sound and movement, allowing repetition as needed for better retention.
4- Lesson Diversification: Videos allow branching from a single topic to related lessons, reinforcing skill acquisition while accommodating individual learning differences.

5- Teacher Time Optimization:Videos free teachers to focus on guidance, counseling, lesson planning, and program production.
6- Promoting Student Participation: Digital videos facilitate active, positive, and effective learner engagement.
7- Physiological Engagement: By stimulating multiple senses, videos help learners grasp content more quickly and retain it more effectively.
8- Visual Appeal: The visual impact of videos makes learning more attractive and engaging for students.
9- Addressing Educational Challenges: Videos can help overcome issues such as teacher shortages and reduce time, effort, and costs associated with traditional teaching.(سلمان سالم سالم المالكي.2013.ص20)

Sixth: Challenges and Strategies in Using Digital Educational Videos

Despite the numerous advantages of digital educational videos, several challenges must be addressed:

6.1 Digital Divide: Some students lack access to the internet or the necessary devices, creating inequalities in learning opportunities:

1 - Digital Divide: Some students lack access to the internet or the necessary devices, creating inequalities in learning opportunities.

2 - Distraction: If not carefully managed, technology can divert students' attention away from educational content.

3 - Teacher Training Needs: Effective use of digital tools requires substantial training and professional development for teachers, which may not always be available.

6.2 Strategies to Overcome Challenges Educational Content Design:

1 - Educational Content Design:

a) Prepare short, focused videos that introduce concepts gradually.

b) Use animation and illustration techniques to simplify complex topics.

c) Provide subtitles to enhance comprehension and accessibility.

2 - Integrating Videos into Curricula :

a) Identify topics that can be reinforced using videos.

b) Plan lessons to include time for video viewing and discussion.

c) Use videos as supplementary material alongside the core curriculum.

3 - Encouraging Interaction and Collaborative Learning :

a) Include interactive questions or tasks to accompany video content.

b) Organize group discussions after video sessions.

c) Encourage students to create their own educational videos to reinforce learning.

4 - Supporting Self-Learning :

a) Make videos available on digital platforms for anytime access.

b) Assign video viewing as part of homework or independent study.

c) Offer diverse content that accommodates individual differences and learning paces.

5 -Teacher Training and Professional Development :

a) Conduct workshops to develop teachers' video production and integration skills.

b) Provide clear guidelines for the effective use of videos in education.

c) Showcase successful examples of video application in teaching to inspire and guide teachers.

Seventh: The Evolution of Information and Communication Technology (ICT) in Education

The rapid advancement of information and communication technology has introduced innovative tools and methods that significantly enhance the educational process. Key developments include:

7.1 Educational Applications

These applications allow students to acquire new skills in engaging, interactive, and innovative ways, making learning both effective and enjoyable.

7.2 Online Educational Platforms

Platforms such as Coursera provide widespread access to educational resources, enabling learners worldwide to access high-quality materials and courses.

7.3 Live Interactive Courses

Live online courses enable teachers to present content visually and interactively, fostering real- time engagement and discussion between instructors and learners.

Conclusion:

Modern information and communication technology, particularly digital videos, has fundamentally transformed the educational process and

teaching methods. Digital videos have demonstrated a significant ability to enhance the quality of education by presenting content in an interactive and engaging manner, improving learners' comprehension, concentration, and retention.

Digital videos also facilitate multiple forms of interaction between teachers and learners, promoting effective communication and active participation in lessons. They support self-directed learning, allowing learners to access content anytime and anywhere, review lessons as needed, and develop independence in learning. Additionally, digital videos contribute to diversifying teaching methods, making education more flexible and adaptable to the varied needs of learners.

Despite these advantages, challenges exist, including the need for teacher training, technical limitations such as internet connectivity, and access to suitable devices. With appropriate planning, infrastructure, and support, these challenges can be overcome, enabling the full potential of digital videos to be realized.

Given the global trend toward e-learning and distance education, integrating digital videos into teaching strategies is essential for creating an innovative learning environment. This integration enhances learners' interaction with course material, supports their academic and intellectual development, and transforms educational practices to meet the demands of contemporary technological advancements. Therefore, the use of digital videos represents a critical step in improving education quality and aligning teaching methods with modern technological capabilities.

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