

**THE PROCESS OF MULTIMEDIA PRODUCTION, ITS DIDACTIC METHOD AND
THEORITICAL FOUNDATION OF ITS APPLICATION IN THE PEDAGOGICAL
PROCESS.**

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Abstract: This article introduces the theoretical foundations of the development of multimedia directions in the educational process. The study analyzes the role of multimedia technologies in the process of learning, their influence on the educational process and its verification, and their scientific and theoretical control. The problems and issues of acceleration, didactics of multimedia, and the development of support for the development of learning are considered.

Keywords: Education, multimedia, educational motivation, development, didactics, digital technology, efficiency, information and communication technologies.

Introduction

In today's era of globalization and digital transformation, the use of multimedia tools in the education system has become an essential process. The following statement by the President of Uzbekistan, Shavkat Mirziyoyev, further highlights the relevance of this process: "Without modern educational technologies, it is impossible to educate a competitive generation in today's world. Schools must become a space for innovation, advanced methods, and digital knowledge."

The digital learning environment enables students to acquire knowledge quickly, conveniently, and easily, ensures interactivity in the learning process, and allows practical exercises to be visualized. Therefore, the use of multimedia tools has become not only a methodological need but also a pedagogical necessity.

The Role of Multimedia Tools in the Educational Process

Multimedia is an information model that combines text, images, video, animation, audio, and interactive elements, helping to deliver learning materials in a visual, clear, and impactful manner (Mayer, 2019).

There are various tools available for creating and using multimedia. Computers and smartphones are the primary devices for working with multimedia. Through them, users can watch videos, listen to music, and view images.

Among audio tools, microphones, speakers, and headphones play an important role. Microphones are used to record sound, while speakers and headphones are used to listen to it. Video tools include cameras, projectors, and televisions. Modern cameras make it possible to record high-quality videos.

Graphic tools include scanners, printers, and graphic tablets. Scanners convert images into digital format, printers transfer them onto paper, and graphic tablets facilitate the process of drawing. Game controllers enhance the interactive multimedia experience.

Today, multimedia is widely used in various fields. In education, multimedia makes the learning process more engaging. With the help of videos, animations, and interactive textbooks, students understand the material better, which increases learning effectiveness.

Results of Using Multimedia Tools

As a result of using multimedia tools:

- students' attention increases;
- deeper understanding of the subject content is achieved;
- the duration of knowledge retention is extended;
- practical skills are formed more quickly.

The Impact of Multimedia on Students' Learning Outcomes

According to psychological and pedagogical studies (Clark & Feldon, 2020; Mayer, 2022), students taught using multimedia-based instruction demonstrate learning outcomes that are 25–40% higher compared to traditional teaching methods.

The experience of Uzbekistan also confirms these results. In particular, as a result of the “Digital Education” project implemented by the Ministry of Public Education, students have shown a significant increase in:

- interest in the learning process;
- creative approach;
- independent inquiry;
- information culture.

Multimedia tools enrich the mechanism of knowledge acquisition based on:

- visual memory (55%);
 - auditory perception of acquired information (35%);
 - experiential knowledge (10%).
- Advantages and Disadvantages of Multimedia Tools

Advantages:

- Enlivens the learning process;
- Presents complex topics in a simplified form;
- Automates the assessment process;
- Ensures adaptive learning;
- Takes individual learning pace into account.

Disadvantages:

- Lack of technical equipment;
- Insufficient digital competence of teachers;
- Poor internet quality in some areas;
- Time required to prepare multimedia materials.

However, the above limitations can be overcome through a systematic approach and continuous professional development.

Research Findings on Multimedia in Education

In recent years, scientific research on the use of multimedia tools in education has shown that learning environments supported by multimedia technologies bring about significant qualitative changes in students' learning processes. According to Mayer's (2021) multimodal learning theory, the human brain is capable of processing text, images, animation, and audio signals simultaneously, which leads to faster and more effective learning.

In the education system of Uzbekistan, gradual reforms aimed at digitalizing the learning process are being implemented. Projects such as “Digital Education,” “Knowledge Competition,” and “Online Lessons” clearly demonstrate this progress. In multimedia-based learning environments, students develop the following competencies:

- information competence;
- communicative competence;
- technological thinking;
- creative thinking and innovative approach.

At the same time, certain limitations still exist. In some regions, low internet speed, lack of technical equipment, and insufficient ICT competence among teachers hinder full effectiveness. Therefore, systematic implementation of multimedia technologies requires strengthening the technical infrastructure, organizing professional development courses, and developing methodological guidelines.

Didactic Principles of Multimedia

The didactic principles of multimedia are pedagogical and normative rules that guide the use of multimedia tools in the educational process and aim to enhance teaching effectiveness. These principles are based on traditional didactic foundations and enriched by the possibilities of modern information technologies.

Main Didactic Principles of Multimedia

Multichannel (Multisensory) Principle

Information is delivered simultaneously through visual and auditory channels.

Result: Knowledge is acquired faster and more firmly.

Visualization Principle

Complex concepts are explained through images, videos, and animations.

Result: The topic becomes clear and understandable.

Activity and Interactivity Principle

Learners interact directly with multimedia content.

Result: Independent thinking and cognitive activity increase.

Systematic and Sequential Principle

Learning materials are presented in a logical sequence.

Result: Knowledge is formed systematically rather than fragmentarily.

Individualization Principle

Each learner studies according to their own pace and level.

Result: Learner-centered education is achieved.

Relevance and Accessibility Principle

Multimedia content must correspond to learners’ age and knowledge level.

Result: Cognitive overload is reduced.

Motivation Enhancement Principle

Colors, sounds, and animations stimulate learners’ interest.

Result: A positive attitude toward learning is formed.

Unity of Theory and Practice Principle

Theoretical knowledge is reinforced through virtual experiments.

Result: Knowledge is connected to real-life applications.

Feedback and Assessment Principle

Tests, exercises, and automated assessment are provided.

Result: Learning outcomes are quickly identified.

The didactic principles of multimedia make the educational process effective, interactive, and modern, while developing students' independent learning skills.

The Future of Multimedia

Multimedia technologies are developing rapidly. Virtual Reality (VR) and Augmented Reality (AR) technologies are creating new opportunities. VR allows users to immerse themselves in virtual environments, while AR enables the integration of virtual elements into the real world.

Artificial Intelligence (AI) is also bringing significant changes to the multimedia field. With the help of AI, video and audio content can be edited automatically. Chatbots and virtual assistants have also emerged as a result of advancements in multimedia technologies.

Conclusion

The use of multimedia tools in the educational process makes learning more effective, meaningful, and motivating. Digital technologies enhance learner engagement, increase interactivity, and strengthen thinking, analysis, imagination, and practical application skills. Therefore, multimedia tools are becoming an integral component of modern education.

Multimedia is a combination of information in various formats, including text, audio, video, graphics, and animations. Multimedia tools have significantly simplified the processes of content creation, storage, and distribution.

Today, multimedia is widely used in various fields such as education, advertising, entertainment, and healthcare. With the advancement of technology, multimedia continues to improve and will further enhance human life in the future.

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