DIGITAL PEDAGOGY AND ITS TOOLS

Aziza Tolibovna Kurbanova
Head of the Department of Information Technologies,
Uzbek State Institute of Arts and Culture, PhD, Associate Professor
e-mail: caro-8787@mail.ru
tel: +998946421688

Abstract

This article explores the concept of digital pedagogy, its core principles, and its significance in the modern educational environment. The paper highlights the role of digital technologies in transforming teaching methods, enhancing learner engagement, and developing digital competencies among students. Particular attention is given to the use of interactive tools, multimedia resources, online platforms, and artificial intelligence in organizing flexible, personalized, and student-centered learning. The author analyzes the pedagogical dimensions of digital didactics and the dynamics of teacher-learner interaction in a digital educational space. The article concludes that the effective integration of digital tools can lead to higher-quality education and more adaptive learning environments.

Keywords: Digital pedagogy, educational technologies, digital teaching tools, interactive learning, multimedia resources, digital didactics, personalized learning, digital competencies, artificial intelligence in education

RAQAMLI PEDAGOGIKA VA UNING VOSITALARI

Annotatsiya

Mazkur maqolada raqamli pedagogika tushunchasining mazmun-mohiyati, uning ta'lim jarayonidagi ahamiyati va o'rni yoritib berilgan. Unda zamonaviy raqamli texnologiyalar asosida ta'limni tashkil etishning metodik yondashuvlari, o'quvchilar va talabalarning raqamli kompetensiyalarini shakllantirishdagi imkoniyatlar ko'rib chiqiladi. Shuningdek, raqamli pedagogikada qo'llaniladigan

_____

interaktiv vositalar, multimediya resurslari, onlayn platformalar, sun'iy intellekt va tahliliy tizimlar haqida tahliliy ma'lumotlar keltirilgan. Muallif raqamli didaktikaning asosiy tamoyillarini, o'qituvchi va o'quvchi o'rtasidagi raqamli muhitdagi munosabatlarni pedagogik nuqtayi nazardan tahlil qiladi. Maqolada raqamli vositalarning ta'lim jarayoniga integratsiyasi orqali sifatli, moslashuvchan va shaxsga yo'naltirilgan o'qitish imkoniyatlari asoslab berilgan.

Kalit so'zlar: raqamli pedagogika, raqamli ta'lim vositalari, raqamli didaktika, ta'lim texnologiyalari, interaktiv metodlar, multimediya resurslari, sun'iy intellect

Implementation of Digital Technologies in Education: Digital Pedagogy and Its Principles in the Context of Cinematic Arts

Today, the integration of digital technologies into the field of education has become a globally relevant issue. The process of digitalization is fundamentally transforming not only the forms of education but also the content, methods, tools, and management systems of the educational process. This transformation enables the development of individualized learning trajectories, the use of interactive resources, and the expansion of distance and blended learning formats. Particularly, the application of artificial intelligence, cloud technologies, multimedia, and mobile applications offers new opportunities to enhance the quality and effectiveness of education. Therefore, the digitalization of education is now considered one of the strategic directions of modern educational systems.

Digital pedagogy represents a contemporary stage of pedagogical practice. It is a scientific-methodological system that improves the content, methodology, tools, and forms of education through the integration of digital technologies and ensures interactive, flexible, and student-centered learning. Digital pedagogy is a pedagogical approach aimed at designing, organizing, managing, and analyzing the learning process through digital means. It facilitates the efficient organization of interactive communication between educators and students in a digital environment. Its tools include components such as **digital didactics** and **digital learning resources.**

_____

Numerous scholars have studied the concept of digital didactics and contributed to its interpretation and theoretical framework.

German scholar **Christoph Thyssen** defines digital didactics as the integration of educational technologies into the teaching process. He emphasizes the use of digital tools to enhance student engagement, support individualized approaches, and leverage multimodal learning resources [1].

Kerstin Mayrberger, a researcher at the University of Hamburg, views digital didactics as a branch of digital pedagogy and defines it as "an approach aimed at improving the effectiveness of education through the use of digital tools" [2].

Researcher **Bernd Zinn** considers digital didactics to be a new model of teaching based on interactive, adaptive, and mobile technologies [3].

K. Aranovskiy highlights the importance of effective resource allocation and innovative approaches when applying digital technologies in education. He stresses the need to improve the preparedness of educators and to integrate digital platforms into the educational process [4].

Researcher **A. Qodirov** has developed methodological foundations for digital education. He defines digital didactics as a modern educational process organized with the help of digital tools [5].

Based on the views of the above-mentioned scholars, we can define digital didactics as a field that studies the methodology and practice of planning, organizing, teaching, and assessing the educational process through digital technologies. It aims to establish a learning environment adapted to modern educational contexts, the needs of students, and the capabilities of digital tools.

Digital didactics is guided by a set of **scientific-methodological principles** that ensure the effectiveness of the digital learning process. These principles serve as the main criteria for selecting the content, format, methods, and tools of teaching [6].

Main Principles of Digital Didactics

1.   **Personalization Principle** Using digital resources tailored to each student's needs, level, and interests. Creating personalized learning trajectories through digital technologies.

_____

2.   **Interactivity Principle** Active interaction between the learner and the learning environment (e.g., quizzes, simulations, feedback systems). Real-time communication between teacher and student, and among peers.

3.   **Visualization and Multimodality Principle** Presenting content through multiple channels (text, graphics, video, audio, animation) to improve memory retention, comprehension, and engagement.

4.   **Adaptability (Flexibility) Principle** The digital environment adapts to the learner's activity (e.g., AI adjusts test difficulty). Learning becomes mobile, remote, and asynchronous.

5.   **Collaboration and Socialization Principle** Developing social learning through collaborative projects, forums, blogs, and chats. Applying a peer-to-peer learning approach.

6.   **Self-assessment and Evaluation Principle** Allowing students to evaluate their knowledge through diagnostics and analytics. Enhancing formative (process-based) assessment.

7.   **Learner Agency and Engagement Principle** The student is not passive but an active participant in the digital environment. Promoting freedom of choice, creativity, and initiative.

8.   **Technological Convenience and Ergonomics Principle** Digital platforms must be user-friendly, intuitive, and accessible. Technologies should support the learning process rather than hinder it.

Technologies should not be seen as obstacles in the educational process, but rather as supportive tools. The role of digital didactics in cinema education holds significant importance within the evolution of modern educational technologies. This approach is particularly effective for students studying in visual, practical, and interactive fields such as cinematic arts.

_____

Figure 1. Fundamental Principles of Digital Didactics

In international practice, digital didactic approaches are recognized as essential tools. Based on the sources studied, the following key didactic approaches are identified:

- Cognitive Theory (Bruner, Mayer) – Teaching through visual information (videos, graphics) activates multi-channel processing. According to Mayer's Multimedia Learning Theory, digital tools help learners acquire knowledge more effectively [7].

_____

- Constructionism (Papert) – The student acts as a creative subject (for example, by creating their own film or script). Project-based digital learning reinforces this approach [8].
- TPACK Model (Mishra & Koehler) – In cinema education, the teacher integrates knowledge of Technology (T), Pedagogy (P), and Content (C) to teach more effectively [9].

The integration of these digital didactic approaches with the aforementioned didactic principles requires digital resources. This is because digital resources are the primary means for developing digital competencies.

Uzbekistan's transition to a digital economy presents serious challenges to higher education, particularly in fostering student autonomy and self-directed learning. Electronic educational resources play a vital role in increasing the effectiveness of teaching and in preparing students to meet the demands of the digital labor market.

Uzbekistan's education system is undergoing a process of digital transformation, which includes the development of ICT skills and the modernization of the ICT infrastructure [10].

Digital educational resources are characterized by various criteria such as the type of information technology used, pedagogical objectives, and content structure. However, such classifications are often insufficient because modern DERs are multifunctional and capable of serving multiple instructional purposes simultaneously, making it difficult to assign them to a single category. Therefore, attention is increasingly paid to the structural, content-related, methodological, and functional components of DERs within emerging digital learning environments [11].

Definition: Digital Educational Resources (DERs) are electronically available materials designed to support teaching, learning, and research. These resources aim to make the learning process more effective, accessible, and engaging for students, educators, and researchers.

Types of Digital Educational Resources

1. **Electronic textbooks and books** – Educational content in PDF, EPUB, or interactive formats.

_____

2.   **Online courses and platforms** – Platforms such as Coursera, Udemy, Khan Academy, edX, Open edX, Moodle, Google Classroom.

3.   **Video lessons and webinars** – Tools like YouTube, Zoom, Microsoft Teams, TED-Ed.

4.   **Interactive apps and software** – Applications like Duolingo (language learning), Photomath (math), Quizlet (flashcards).

5.   **Virtual and Augmented Reality (VR/AR)** – Examples include Labster (virtual labs) and Google Expeditions (virtual field trips).

6.   **Gamified learning platforms** – Such as Kahoot!, Quizizz, ClassDojo.

7.   **Open Educational Resources (OER)** – Free access to content from MIT OpenCourseWare, OpenStax, etc.

8.   **Cloud services and collaboration tools** – Google Drive, Notion, Trello, Miro.

9.   **AI-based learning assistants** – Tools like ChatGPT, DeepSeek, Socratic (by Google), Grammarly.

Evaluation and Expert Review of DERs

Recently, expert psychological-pedagogical evaluation methods have been introduced to assess the effectiveness of digital educational resources. Unlike psychological diagnostics based on experimental learning data, expert evaluations are based on predefined criteria and depend largely on the methodology of evaluation and the qualifications of the experts involved.

A digital educational resource typically includes a structured topic map, content, metadata, and is designed to meet specific goals within a digital learning environment. Its structure, methodology, tools, and application practices are closely linked to the purpose and context of use.

Didactic Functions of Digital Educational Resources

Digital resources serve the following core didactic functions:

•   **Knowledge delivery and concept formation** – Presenting content clearly and interactively to aid in understanding and knowledge acquisition.

•   **Skill and competency development** – Supporting logical thinking, creativity, and analytical skills through simulations, practice tasks, and tests.

_____

- **Personalized learning** – Offering adaptive resources tailored to each learner's pace and ability (e.g., AI-powered platforms).
- **Motivation and engagement** – Enhancing interest through gamification, multimedia content, and interactive elements.
- **Self-assessment and progress monitoring** – Enabling learners to test their knowledge through diagnostics, auto-graded assessments, and feedback.
- **Encouraging distance collaboration** – Supporting communication and collaborative projects in virtual learning environments.
- **Content updating and relevance –** Incorporating new scientific insights and pedagogical innovations into educational content on a regular basis.

References

1. Thyssen, C. (2020). Digitale Didaktik: Grundlagen, Praxisbeispiele und Perspektiven. Beltz Verlag.
2. Mayrberger, K. (2018). Digitalisierung in der Hochschullehre. In: Handbuch Hochschullehre Digital. Springer VS.
3. Zinn, B. (2016). Didaktik im digitalen Wandel. In: Beiträge zur Lehrerbildung.
4. Qodirov A. (2021). Raqamli pedagogika asoslari. Darslik. Toshkent: O'zMU nashriyoti.
5. Kurbanova A.T. CONTENTS OF THE DEVELOPMENT OF DIGITAL COMPETENCIES OF STUDENTS USING ART PEDAGOGY. Manuscripts on the Artificial Intelligence and Digital Research 1 (Vol,1)
6. AT Kurbanova, AV Tolmachev, EV Patsyuk, VS Ustenko. Digital Inclusiveness for Sustainable Development. Digital Inclusiveness: Bridging the Divide in the Digital Economy, 111-123
7. Mayer, R. E. (2001). Multimedia Learning. Cambridge University Press.Papert, S. (1980). Mindstorms: Children, Computers, and Powerful Ideas. Basic Books.
8. Mishra, P., & Koehler, M. J. (2006). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge. Teachers College Record, 108(6), 1017–1054.

_____

9. Shadibekova, D., Abdurahmanovna. (2022). 10. Digital Transformation of University Education in Uzbekistan. doi: 10.54216/ijSIet.010204

10. V.I. Blinov, M.V. Dulinov, E.Yu. Yesenina, I.S. Sergeev, Draft didactic concept for digital vocational education and trSIning, 6 (Moscow, 2019)

11. Puentedura R. "Learning technology and the SAMR model: Goals, process, andprectise" Society for Information Technology & Teacher Education International Conference, Mar 05, 2017, 2.