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DIGITAL PEDAGOGY: THE IMPACT OF PROGRAMMING AND WEB TECHNOLOGIES ON THE MODERN EDUCATION SYSTEM

Annotation: This article provides a detailed analysis of the role of programming and web technologies in the modern education system and their impact on the learning process through digital pedagogy. It highlights the role of innovative approaches in making education interactive and effective. The article discusses how these technologies increase students' interest in education, introduce new methods of knowledge consolidation, and offer convenient tools for teachers. Additionally, it explores the challenges of integrating digital technologies into the education system and suggests solutions to overcome them.

Key words:digital pedagogy, programming, web technologies, interactive learning, modern teaching methods, distance learning.

Annotatsiya: Ushbu maqolada zamonaviy ta'lim tizimida dasturlash va veb-texnologiyalarning o'rni, ularning raqamli pedagogika orqali ta'lim jarayoniga ta'siri batafsil tahlil qilingan. Ta'limni interaktiv va samarali qilishda innovatsion yondashuvlarning roli yoritilgan. Ushbu texnologiyalar yordamida o'quvchilarning ta'limga bo'lgan qiziqishi oshishi, bilimni mustahkamlashning yangi metodlari va o'qituvchilar uchun qulay vositalar haqida ma'lumot berilgan. Shuningdek, raqamli texnologiyalarning ta'lim tizimida joriy etilishidagi qiyinchiliklar va ularni bartaraf etish usullari o'rganilgan.

Kalit so'zlar:raqamli pedagogika, dasturlash, veb-texnologiyalar, interaktiv ta'lim, zamonaviy ta'lim metodlari, masofaviy o'qitish.

Аннотация:В данной статье подробно анализируется роль программирования и веб-технологий в современной системе образования, а также их влияние на процесс обучения через цифровую педагогику. Подчеркивается роль инновационных подходов в повышении интерактивности и эффективности образования. В статье рассматривается, как эти технологии повышают интерес учащихся к обучению, предлагают новые методы закрепления знаний и удобные инструменты для учителей. Кроме того, изучаются проблемы внедрения цифровых технологий в систему образования и предлагаются пути их решения.

Ключевые слова: цифровая педагогика, программирование, веб-технологии, интерактивное обучение, современные методы преподавания, дистанционное обучение.

Introduction: In today's era of globalization, digital technologies are impacting nearly every sphere of human activity. In the field of education, this process is both deep and rapid. Transforming the educational process into an interactive and individualized approach with the help of digital technologies is one of the pressing tasks of today. Programming and web technologies serve as the main foundation for these changes, providing opportunities to introduce new teaching methodologies and improve the quality of education.

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Digital pedagogy is a methodological approach aimed at improving the teaching process through the use of information and communication technologies. This approach creates the following opportunities in the educational process: Individualizing the learning process for students, Making the educational process more engaging and intuitive, Providing methodological support to teachers.

Additionally, the integration of digital tools into the education system opens up the opportunity to democratize global education, ensuring that education reaches every individual. However, the issues of technological dependency and the lack of technical infrastructure in the education process remain relevant and pressing.

Development and changes in digital pedagogy: The term "digital pedagogy" has become widely used today and is related to changes in educational technologies, which aim to increase the effectiveness of the teaching process and create opportunities for students to manage their own learning. Digital pedagogy enables the effective management of the learning and teaching processes through the introduction of innovative approaches and the integration of digital technologies into education.

Characteristics of digital pedagogy: Digital pedagogy stands out from traditional education through the following key characteristics:

Interactivity: Digital pedagogy involves the use of multimedia tools, which make the learning process more dynamic and engaging. For instance, with virtual laboratories, simulations, and interactive textbooks, students can test the subjects they are learning through real-life examples.

Distance learning: Distance education holds a significant place in the modern education system. Online platforms provide students with the opportunity to learn without geographical limitations.

Individual learning: Digital tools allow the creation of educational programs tailored to each student's level of knowledge. This accelerates the learning process and helps students fully realize their potential.

Key characteristics of digital pedagogy

Characteristic	**Explanation**
Interactivity	Conducting engaging lessons through multimedia tools.
Individual	Individualized approach for each student.
Remote Learning	Providing education without geographical limitations.

The role of programming and web technologies in education

1.The impact of programming on education

Through the use of programming languages and tools, the development of educational materials significantly improves the learning process. For example, by using the Python programming language, it is possible to create programs that automate mathematical problem-solving for students.

2.Advancing education with web technologies

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Web technologies help strengthen interactive communication between students and teachers. Platforms like Google Classroom, Edmodo, and Microsoft Teams serve as excellent examples of how web technologies can enhance the educational experience.

Software and web tools used in education

Explanation: These software and web tools are commonly used in the education sector to facilitate learning and teaching. Each tool has its unique advantages and disadvantages:

Moodle **-** offers extensive features and flexibility, making it suitable for a variety of educational settings. However, its initial setup may be challenging for users with limited technical knowledge.

Google Classroom - is praised for its user-friendly interface, making it accessible and easy for both teachers and students. Despite this, its advanced features are limited, which may not meet the needs of more complex educational environments.

Microsoft Teams - is a powerful tool for conducting online classes, providing seamless integration for virtual collaboration. However, it is heavily dependent on technical resources, which may not be accessible in all regions or under all conditions.

Tool	Advantages	Disadvantages
Moodle	Wide range of features and flexibility	Initial setup can be complex
Google Classroom	User-friendly interface	Limited advanced features
Microsoft Teams	Strong tool for online classes	Dependence on technical resources

Encouraging the use of technology: To train teachers in the effective use of technology, special programs and training sessions should be organized. The participation of teachers in learning new methods and technologies is crucial. Additionally, creating opportunities for teachers to familiarize themselves with online courses, training sessions, and new digital resources is essential.

Reducing technological dependency in education: To reduce dependency on technology, alternative teaching methods can be implemented. In case of technical failures or network issues, offline alternatives and resources should be provided to ensure students can continue their learning process.

The impact of digital pedagogy on the global education system: Digital technologies not only make education more efficient but also offer the opportunity to democratize education on a global scale. For instance, students from different parts of the world, regardless of regional restrictions, can receive education of the same quality through distance learning systems. This, in turn, helps reduce global inequalities in education.

The future development of digital pedagogy: For the future development of digital pedagogy, it is essential to improve educational infrastructure, train teachers in digital competencies, and create

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interactive learning materials. Additionally, students should be equipped with skills to use technological tools not only for learning but also for success in social and professional life.

The future of digital educational tools: New educational technologies such as virtual and augmented reality, artificial intelligence (AI), and machine learning have the potential to create more interactive and personalized learning experiences. These tools will help students learn complex content more easily and effectively.

Innovative methods to increase student engagement: Innovative methods can enhance students' interest in learning. For example, gamification and interactive quizzes can boost students' motivation and make the learning process more engaging and effective.

Annual differences in digital pedagogy (1990-2024)

Year Range	Key Features of Digital Pedagogy	Differences
1990-2000	Computer-assisted learning, digital format presentation of educational materials.	Primarily focused on introducing teachers to technologies.
2000-2010	Interactive learning platforms, online education, email, and forums.	Development of interactive communication and distance learning.
2010-2019	MOOC platforms, online teaching and assessment systems, mobile apps.	Expansion of new teaching methods and global education through distance learning.
2019-2024	Growth of distance learning during and after the pandemic, AI (artificial intelligence), online assessments, and personalized teaching systems for educators.	Introduction of personalized and interactive online learning systems for students.

New approaches in digital pedagogy

Role of artificial intelligence in education**:** Artificial Intelligence (AI) creates new opportunities for both teachers and students in digital pedagogy. AI systems tailor the learning experience based on the individual characteristics of the learner. This, in turn, helps monitor students' progress and develop adaptable teaching methods. Adaptive learning systems provide personalized learning resources according to the unique needs of each student.

Big data and learning analytics in education: Big Data and Learning Analytics technologies are increasingly being used to monitor and analyze the educational process. These technologies enable real-time collection and analysis of precise data related to education. This helps educators identify students' achievements and challenges and adapt teaching strategies accordingly.

Big data technology analyzes students' learning outcomes and behaviors, providing a crucial resource for improving the educational process. Learning Analytics, on the other hand, allows decisions to be

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made based on this data to enhance the teaching experience. For instance, it can help identify topics that students are struggling with, create personalized lesson plans, or optimize the overall learning process.

Digital pedagogy and societal change

Digital divide: One of the challenges associated with the development of digital pedagogy is the digital divide. This term refers to the gap in access to the internet and digital devices, which limits the equal opportunity for students at all levels to access education. Therefore, ensuring equity in the implementation of digital education becomes a crucial issue. It is important to address these disparities to make sure that all students, regardless of their socioeconomic background, can benefit from digital learning opportunities.

Global education adaptation: One of the greatest advantages of digital education is its ability to help spread education worldwide. The global adaptation of educational systems allows students to choose the learning resources and methods that suit them best. Additionally, it opens up possibilities for creating educational materials that are tailored to the cultural backgrounds and specific needs of students, thereby promoting a more inclusive and diverse learning environment across the globe.

Challenges and Issues

Technological dependence: The educational process may be interrupted due to technical malfunctions or network issues.

Lack of technical infrastructure: In some areas, poor internet quality and inadequate technical resources create problems.

Lack of staff literacy: Teachers' insufficient skills in using technologies can complicate the teaching process.

Solutions:

1. Organize special training programs to teach teachers how to effectively use technology.
2. Attract investments from both the public and private sectors to improve technical infrastructure.
3. Develop educational programs that are more flexible and easy to use.

Conclusion: Digital pedagogy is taking modern education to a new level. Through programming and web technologies, the learning process can be made more interactive, effective, and personalized. These technologies also ensure that education reaches everyone, democratizing the process of knowledge acquisition on a global scale.

To further develop digital pedagogy in the future, the following areas must be prioritized: Developing technical infrastructure, Enhancing teachers' technological literacy, Designing educational materials based on individualized approaches.

The deep integration of digital technologies into the educational process will serve to elevate the quality of education to even higher levels in the future.

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