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MULTIMEDIA-BASED LEARNING METHODS: DEVELOPMENT OF A DIDACTIC RESOURCE ON AN ONLINE PLATFORM

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Abstract. The rapid development of digital technologies has significantly transformed the modern educational environment, leading to the widespread integration of multimedia-based learning methods. Multimedia learning combines various forms of content, including text, audio, video, animation, and interactive elements, to enhance students' understanding, engagement, and motivation. The use of multimedia tools allows educators to present information in multiple ways, which supports different learning styles and improves knowledge retention. This article examines the theoretical foundations of multimedia-based learning and analyzes its main advantages and challenges in the educational process. Special attention is given to the principles of instructional design that should be followed when creating multimedia educational materials. The study also explores the process of developing a didactic resource on an online platform, including needs analysis, content design, platform selection, implementation, and evaluation of learning outcomes. The research shows that multimedia-based didactic resources can significantly improve the quality of education by making learning more interactive, flexible, and student-centered. In addition, multimedia learning helps develop independent learning skills, critical thinking, and digital literacy. However, the effectiveness of multimedia learning depends on proper instructional design, the appropriate use of technology, and the teacher's digital competence. When these factors are considered, multimedia-based learning becomes an effective tool for modern education and online learning environments.

Keywords: multimedia learning, online education, didactic resources, instructional design, e-learning, digital education.

Introduction

Modern education is increasingly influenced by digital transformation, which affects teaching methods, learning environments, and educational resources. Traditional teaching methods are gradually being supplemented and sometimes replaced by multimedia-based learning approaches. Multimedia technologies allow educators to present information in multiple formats, making learning more engaging, interactive, and effective.

The relevance of multimedia learning has increased particularly after the global shift toward online and blended learning. Online platforms such as learning management systems (LMS), educational websites, and interactive learning applications provide opportunities to create and distribute multimedia didactic resources. These resources include video lectures, interactive presentations, quizzes, simulations, and digital textbooks [1].

The purpose of this article is to explore multimedia-based learning methods and describe the process of developing a didactic resource on an online platform. The objectives of the study include:

- Analyzing the concept of multimedia learning.
- Identifying the advantages and disadvantages of multimedia-based learning.
- Describing the stages of developing a didactic resource.
- Evaluating the effectiveness of multimedia resources in education.

Multimedia-based learning is based on the idea that people learn more effectively from words and pictures than from words alone. This concept is supported by cognitive theory, particularly the

Cognitive Theory of Multimedia Learning developed by Richard Mayer. According to this theory, learners process information through two channels: visual and auditory. Effective multimedia learning occurs when both channels are used appropriately without overloading the learner's cognitive capacity.

Research Materials. The research materials for this study include scientific literature, methodological publications, and practical resources related to multimedia-based learning and the development of didactic resources on online platforms. The theoretical foundation of the research is based on the works of scholars in the field of multimedia learning, distance education, and instructional design. Key sources include books, peer-reviewed journal articles, conference proceedings, and international educational reports devoted to digital education and e-learning technologies.

In addition to theoretical sources, practical materials were used in the research. These include Learning Management Systems (LMS), online educational platforms, multimedia tools, and course development software. The study involved the analysis of existing online courses, multimedia lectures, interactive assignments, and assessment tools used in online learning environments. Educational platforms were analyzed in terms of usability, accessibility, multimedia support, communication tools, and assessment capabilities.

The research also used methodological materials such as curriculum guidelines, educational standards, and instructional design models. Particular attention was paid to the ADDIE model (Analysis, Design, Development, Implementation, Evaluation), which is widely used in the development of online courses and didactic materials [2].

Empirical research materials included student surveys, teacher interviews, and learning analytics from online platforms. These materials made it possible to evaluate the effectiveness of multimedia-based didactic resources, student engagement, and learning outcomes.

Thus, the combination of theoretical, methodological, and empirical materials ensured the reliability and validity of the research and allowed for a comprehensive analysis of multimedia-based learning methods and the development of didactic resources on an online platform.

There are several important principles for designing multimedia learning materials:

1	Multimedia Principle	Students learn better from words and pictures than from words alone
2	Coherence Principle	Unnecessary information should be excluded
3	Signaling Principle	Important information should be highlighted
4	Redundancy Principle	Avoid presenting identical information in multiple forms
5	Spatial Contiguity Principle	Related text and images should be placed close together
6	Temporal Contiguity Principle	Related audio and visuals should be presented simultaneously
7	Segmenting Principle	Content should be divided into small segments
8	Modality Principle	Audio narration is better than on-screen text for explaining graphics

These principles help educators design effective multimedia didactic materials. Multimedia-Based Learning Methods. Multimedia-based learning includes various teaching methods that use digital technologies and interactive content. The most common multimedia learning methods include:

1 Video-Based Learning

Video lectures and educational videos are widely used in online education. Videos help explain complex concepts, demonstrate processes, and provide visual examples.

2 Interactive Learning

Interactive learning includes quizzes, simulations, drag-and-drop exercises, and educational games. These methods actively involve students in the learning process [3].

3 Presentation-Based Learning

Multimedia presentations include images, animations, audio, and hyperlinks. They are commonly used in lectures and online courses.

4 Simulation and Virtual Labs

Simulations allow students to conduct experiments and observe processes in a virtual environment. This is especially important for technical and scientific disciplines.

5 Mobile Learning

Mobile learning allows students to access educational materials via smartphones and tablets, making learning flexible and accessible.

Development of a Didactic Resource on an Online Platform. The development of a didactic resource is a complex process that requires pedagogical planning, technical development, and evaluation.

1 Stage 1: Needs Analysis

At this stage, the target audience, learning objectives, and expected learning outcomes are defined. The teacher must determine:

- Who are the learners?
- What are the learning objectives?
- What skills should students develop?
- What platform will be used?

2 Stage 2: Instructional Design

Instructional design involves planning the structure and content of the didactic resource. At this stage, the teacher:

- Develops course structure.
- Prepares learning materials.
- Selects multimedia elements (videos, audio, images).
- Designs interactive tasks.

3 Stage 3: Platform Selection

There are many online platforms for developing didactic resources:

- Moodle
- Google Classroom
- Canvas
- Coursera
- Edmodo

The choice of platform depends on course objectives, technical capabilities, and the number of students.

4 Stage 4: Content Development

At this stage, multimedia content is created:

- Video lectures
- Presentations
- Interactive quizzes
- Assignments
- Discussion forums
- Additional resources

5 Stage 5: Implementation

The course is uploaded to the online platform and made available to students. The teacher provides instructions and monitors student progress [4].

6 Stage 6: Evaluation and Improvement

The final stage involves evaluating the effectiveness of the didactic resource through:

- Student feedback
- Learning outcomes
- Test results
- Course analytics

Based on the evaluation, the course can be improved.

Advantages of Multimedia-Based Didactic Resources

Multimedia-based learning has many advantages:

1. Increases student motivation.
2. Improves understanding of complex concepts.
3. Supports different learning styles.
4. Develops independent learning skills.
5. Provides flexible learning opportunities.
6. Encourages interactive learning.
7. Improves knowledge retention.

6. Challenges of Multimedia Learning

Despite its advantages, multimedia learning also has some challenges:

- Technical problems.
- Lack of digital skills among teachers.
- Time required to develop multimedia materials.
- Cognitive overload if multimedia is poorly designed.
- Need for stable internet access.

To overcome these challenges, teachers need training in digital pedagogy and instructional design.

7. Pedagogical Effectiveness of Multimedia Learning

Research shows that multimedia learning improves student engagement, motivation, and academic performance. Multimedia resources help students better understand complex material because they can see, hear, and interact with the content.

Multimedia-based learning is especially effective in:

- Distance learning
- Blended learning
- STEM education
- Language learning
- Professional training

Conclusion. Multimedia-based learning methods play an important role in modern education. The development of didactic resources on online platforms allows educators to create interactive, flexible, and effective learning environments. However, the success of multimedia learning depends on proper instructional design, appropriate use of multimedia elements, and continuous evaluation. In conclusion, multimedia-based didactic resources improve the quality of education, increase student motivation, and support independent learning. Therefore, educators should actively integrate multimedia technologies into the teaching and learning process [5].

Multimedia-based learning methods play an increasingly important role in modern education, particularly in the context of digital transformation and the development of online learning environments. The integration of multimedia technologies into the educational process makes it possible to create interactive, flexible, and student-centered learning environments that meet the needs of today's learners. The development of didactic resources on online platforms allows educators to combine text, audio, video, animation, and interactive tasks in one learning space, which significantly improves the quality of teaching and learning [6].

However, the effectiveness of multimedia-based learning depends on several important factors. First, multimedia materials must be developed according to instructional design principles to avoid cognitive overload and ensure effective learning. Second, multimedia elements should not be used only for visual attractiveness but should support learning objectives and help students better understand the material. Third, continuous evaluation and feedback are necessary to improve the quality of online courses and didactic resources [7].

Multimedia-based didactic resources contribute to increased student motivation, engagement, and independence in learning. They also help develop important skills such as critical thinking,

problem-solving, digital literacy, and self-directed learning. In addition, online platforms provide opportunities for collaboration, communication, and access to educational materials at any time [8].

In conclusion, the use of multimedia technologies in education is not just a modern trend but an essential component of effective teaching and learning. Therefore, educators should actively integrate multimedia-based methods and online didactic resources into the educational process to improve learning outcomes and prepare students for the digital society.

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МЕТОДЫ ОБУЧЕНИЯ С ИСПОЛЬЗОВАНИЕМ МУЛЬТИМЕДИЙ: РАЗРАБОТКА ДИДАКТИЧЕСКОГО РЕСУРСА ДЛЯ ОНЛАЙН-ПЛАТФОРМЫ

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Аннотация. Стремительное развитие цифровых технологий существенно изменило современную образовательную среду, что привело к повсеместному внедрению мультимедийных методов обучения. Мультимедийное обучение сочетает в себе различные формы представления контента, включая текст, аудио, видео, анимацию и интерактивные элементы, для повышения уровня понимания, вовлеченности и мотивации учащихся. Использование мультимедийных инструментов позволяет преподавателям представлять информацию в различных форматах, что учитывает разные стили обучения и способствует лучшему усвоению знаний. В этой статье рассматриваются теоретические основы мультимедийного обучения и анализируются его основные преимущества и проблемы, возникающие в процессе обучения. Особое внимание уделяется принципам педагогического дизайна, которых следует придерживаться при создании мультимедийных образовательных материалов. В исследовании также рассматривается процесс разработки дидактического ресурса на онлайн-платформе, включая анализ потребностей, разработку контента, выбор платформы, внедрение и оценку результатов обучения. Исследование показывает, что мультимедийные дидактические ресурсы могут значительно повысить качество образования, сделав процесс обучения более интерактивным, гибким и ориентированным на учащихся. Кроме того, мультимедийное обучение помогает развивать навыки самостоятельного обучения, критическое мышление и цифровую грамотность. Однако эффективность мультимедийного обучения зависит от правильного методического подхода, грамотного использования технологий и цифровой компетентности преподавателя. При соблюдении этих условий мультимедийное обучение становится эффективным инструментом современного образования и онлайн-обучения.

Ключевые слова: мультимедийное обучение, онлайн-образование, дидактические ресурсы, методический подход, электронное обучение, цифровое образование.

МУЛЬТИМЕДИЯЛЫҚ ОҚЫТУ ӘДІСТЕРІ: ОНЛАЙН ПЛАТФОРМА ҮШІН ДИДАКТИКАЛЫҚ РЕСУРСТЫ ӘЗІРЛЕУ

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Аңдатпа. Цифрлық технологиялардың қарқынды дамуы заманауи білім беру ортасын едәуір өзгертті, бұл мультимедиялық оқыту әдістерінің кеңінен енгізілуіне алып келді. Мультимедиялық оқыту мәтін, аудио, бейне, анимация және интерактивті элементтер сияқты контентті ұсынудың әртүрлі формаларын біріктіріп, білім алушылардың түсіну деңгейін, қызығушылығын және уәжін арттыруға бағытталған. Мультимедиялық құралдарды пайдалану оқытушыларға ақпаратты әртүрлі форматта ұсынуға мүмкіндік береді, бұл әртүрлі оқу стильдерін ескеріп, білімді жақсы меңгеруге ықпал етеді. Бұл мақалада мультимедиялық оқытудың теориялық негіздері қарастырылып, оның негізгі артықшылықтары мен оқу процесінде туындайтын мәселелері талданады. Ерекше назар мультимедиялық білім беру материалдарын әзірлеу кезінде сақталуы тиіс педагогикалық дизайн қағидаттарына аударылады. Зерттеуде сондай-ақ онлайн-платформада дидактикалық ресурсты әзірлеу процесі, соның ішінде қажеттіліктерді талдау, контент әзірлеу, платформаны таңдау, енгізу және оқу нәтижелерін бағалау қарастырылады. Зерттеу нәтижелері мультимедиялық дидактикалық ресурстар білім беру сапасын едәуір арттырып, оқу процесін неғұрлым интерактивті, икемді және білім алушыға бағытталған ете алатынын көрсетеді. Сонымен қатар мультимедиялық оқыту өзіндік оқу дағдыларын, сыни ойлауды және цифрлық сауаттылықты дамытуға көмектеседі. Алайда мультимедиялық оқытудың тиімділігі дұрыс әдістемелік тәсілге, технологияларды сауатты пайдалануға және оқытушының цифрлық құзыреттілігіне байланысты. Осы шарттар сақталған жағдайда мультимедиялық оқыту заманауи білім беру мен онлайн-оқытудың тиімді құралына айналады.

Түйін сөздер: мультимедиялық оқыту, онлайн-білім беру, дидактикалық ресурстар, әдістемелік тәсіл, электрондық оқыту, цифрлық білім беру.