Zahoruiko D. M., Master, Vyshnevska M. O., Assoc. prof.
Kyiv National University of Technologies and Design

INTERACTIVE PRESENTATIONS AND MULTIMEDIA PLATFORMS AS TOOLS TO INCREASE STUDENT ENGAGEMENT IN THE DIGITAL EDUCATIONAL ENVIRONMENT

Abstract. *The article examines the possibilities of using interactive presentations and multimedia platforms as effective tools for increasing student engagement in the learning process in the context of the digital transformation of education. It emphasizes that modern technologies create a new paradigm of the educational environment, in which the interaction between the teacher and students occurs through interactive mechanisms – elements of gamification, multimedia content, dynamic presentations, simulation programs and virtual environments.*

Particular attention is paid to the function of these tools in ensuring the continuity of education during martial law in Ukraine, when digital technologies have become the main means of communication and learning. It is revealed how interactive platforms contribute to the preservation of the educational process, support the emotional stability of students, ensure psychological adaptation and form a sense of unity of the educational community even in times of crisis.

In the post-war period, the use of interactive solutions is considered a key factor in the modernization of the education system, the restoration of educational infrastructure and the implementation of inclusive approaches. Such technologies contribute to the formation of a new culture of learning, focused on the development of critical thinking, creativity, media literacy and social interaction.

Keywords: *Interactive presentations, multimedia platforms, digitization of education, digital educational environment, student involvement.*

Загоруйко Д. М., магістр, Вишневська М. О., доц.
Київський національний університет технологій та дизайну

ІНТЕРАКТИВНІ ПРЕЗЕНТАЦІЇ ТА МУЛЬТИМЕДІЙНІ ПЛАТФОРМИ ЯК ІНСТРУМЕНТИ ПІДВИЩЕННЯ ЗАЛУЧЕНОСТІ УЧНІВ У ЦИФРОВОМУ ОСВІТНЬОМУ СЕРЕДОВИЩІ

Анотація. *У статті розглянуто можливості використання інтерактивних презентацій і мультимедійних платформ як ефективних інструментів підвищення залученості учнів у процес навчання в умовах цифрової трансформації освіти. Акцентовано увагу на тому, що сучасні технології створюють нову парадигму освітнього середовища, у якому взаємодія між викладачем і здобувачами освіти відбувається через інтерактивні механізми – елементи гейміфікації, мультимедійний контент, динамічні презентації, симуляційні програми та віртуальні середовища.*

Особлива увага приділена функції цих інструментів у забезпеченні безперервності освіти під час воєнного стану в Україні, коли цифрові технології стали основним засобом комунікації та навчання. Розкрито, як інтерактивні платформи сприяють збереженню освітнього процесу, підтримують емоційну стійкість учнів, забезпечують психологічну адаптацію та формують відчуття єдності освітньої спільноти навіть за умов кризи.

У післявоєнний період застосування інтерактивних рішень розглядається як ключовий чинник модернізації системи освіти, відновлення навчальної інфраструктури та впровадження інклюзивних підходів. Такі технології сприяють формуванню нової культури навчання, орієнтованої на розвиток критичного мислення, творчості, медіаграмотності та соціальної взаємодії.

Підкреслено, що інтерактивність у сучасній освіті виступає не лише технічним засобом, а й педагогічним принципом, який визначає характер взаємодії, підвищує мотивацію та активну участь учнів, формує готовність до навчання в умовах невизначеності та постійних змін.

Ключові слова: *інтерактивні презентації, мультимедійні платформи, цифровізація освіти, цифрове освітнє середовище, залученість учнів.*

Introduction. In the contemporary information society, digital technologies are fundamentally reshaping pedagogical approaches, moving the educational paradigm beyond traditional, one-directional instruction. The established dynamics between teachers and students are progressively giving way to interactive formats that prioritize dialogue, mutual participation, and digitally-mediated communication. Leveraging multimedia and interactive tools does more than simply transmit information; it fosters a new mode of thinking oriented toward active engagement, collaborative problem-solving, and self-directed knowledge construction [6].

These interactive technologies have cemented their role as a cornerstone of innovative education, directly supporting the development of key competencies outlined by international standards-most notably creativity, critical thinking, communication, and digital literacy. The significance of this shift has been thrown into sharp relief by the wartime reality in Ukraine. In this context of profound disruption, interactive platforms have proven indispensable, providing a vital lifeline for educational continuity amidst widespread infrastructure destruction, mass displacement, and severe psychological distress [4]. They have evolved from a pedagogical enhancement to a critical infrastructure for resilience.

This transformation has been decades in the making. Over the past thirty years, interactive learning technologies have matured from simple auxiliary aids-such as CD-ROMs and basic PowerPoint presentations-into sophisticated, integrated learning ecosystems. Modern platforms now seamlessly blend elements of gamification, cloud-based services, real-time performance analytics, and tools for remote collaboration, creating immersive and adaptive educational environments.

However, despite the widespread adoption and demonstrable utility of these tools, a significant gap remains in the scholarly literature. While their efficacy in stable, peacetime conditions has been studied, there is a pressing lack of rigorous research into their specific effectiveness within the extreme and unpredictable conditions of war and the subsequent post-war recovery period. This article seeks to address this gap by examining how interactive learning formats not only sustain but also transform education in times of crisis.

Setting objectives. The purpose of this article is to investigate the role of interactive presentations and multimedia platforms in enhancing the engagement of pupils and students in the digital educational environment, as well as in ensuring the sustainability and adaptability of the educational process during wartime and post-war recovery. An additional task is to analyze the pedagogical and psychological advantages of interactive technologies, in particular their impact on motivation, cognitive activity, the formation of critical thinking, and effective communication between participants in the educational process. Particular attention is paid to identifying mechanisms for adapting learning platforms to different age groups, the level of digital competence of students and teachers, as well as to limited resources and crisis conditions that arise during military conflicts. This approach allows interactive technologies to be evaluated not only as a tool for knowledge transfer but also as a means of ensuring safe, effective, and inclusive learning in complex socio-psychological conditions.

Research Results. In contradistinction to conventional presentations, interactive presentations facilitate two-way interaction between the instructor and the audience. As

demonstrated in the research conducted by K. Jelemenská, P. Čičák and V. Dúcky, the utilization of multimedia interactive presentations within educational settings has been shown to enhance the comprehension of information, whilst concurrently stimulating increased student engagement. The incorporation of interactive elements, such as quizzes, hyperlinks, and dynamic diagrams, into such presentations has been found to elicit cognitive activity [2].

During periods of martial law, such interactive presentations evolve into a universal medium of communication, integrating text, audiovisual, and interactive components to create a comprehensive learning environment even in crisis situations. These materials enable educators to sustain the uninterrupted progression of the educational process by adapting the content to the constrained time and technical resources available to students. Learning modules can be organized in a number of different ways. They can be arranged as a series of short synchronous online classes or in an asynchronous learning format. The latter option allows students to review materials at their own pace and convenience, repeat difficult topics, and reinforce their knowledge through interactive exercises.

Furthermore, such presentations contribute to supporting the emotional and psychological well-being of students: interactive tasks and multimedia elements alleviate fatigue associated with distance learning, heighten the level of engagement, and facilitate the creation of a sense of collaborative work even amidst the physical separation of the classroom. The utilization of interactive platforms also ensures a flexible organization of communication between students and instructors, permits the execution of prompt knowledge assessment, the reception of immediate feedback, and the adjustment of the educational process in accordance with student needs, which is particularly critical under conditions of war [4; 6].

Thus, interactive presentations not only ensure the transmission of educational content but also establish a resilient system for educational support, capable of adapting to unpredictable circumstances and guaranteeing the continuity of learning even in complex crisis environments.

The full-scale invasion of Ukraine in 2022 necessitated an unprecedented and immediate transition to distance learning. This challenge was met through the rapid adoption of a suite of multimedia platforms, including Google Classroom, Zoom, Nearpod, Canva, and Kahoot. These digital environments swiftly evolved from mere educational tools into a critical infrastructure for pedagogical continuity. However, their role transcended the simple preservation of learning opportunities; they unexpectedly became a vital conduit for emotional and psychological support. In a time of profound trauma and displacement, features like joint interactive tasks, collaborative quizzes, and shared creative projects fostered crucial moments of connection and normalcy. These activities cultivated a resilient sense of community, providing a digital anchor for children who had lost their familiar social environments, their schools, and in many cases, their homes.

This critical functionality is supported by research. The study by M. Thielsch and I. Perabo [6] confirms that the inherent flexibility and adaptability of multimedia systems are key to their efficacy, particularly for users operating under stressful and unpredictable conditions. In the stark reality of wartime Ukraine, this theoretical advantage translated into tangible, life-saving resilience. The very architecture of these platforms empowered the educational process to become location-agnostic, allowing for lessons to continue uninterrupted from bomb shelters, temporary accommodation centers, or even from across international borders as families were displaced. This demonstrated that, with the proper technological framework, the quality of education need not be a casualty of war, and that maintaining a stable learning routine can itself be a form of psychological first aid for a traumatized generation.

In addition, the integration of different platforms enables the creation of a multisensory learning environment, where video, animation, audio, interactive exercises, and game elements

simultaneously engage multiple channels of perception, thereby increasing the effectiveness of material retention. Digital platforms also enable teachers to monitor learning activity, analyze each student's progress, and adapt tasks to individual needs. Taken together, this not only ensures the transfer of knowledge but also supports the psychological resilience and motivation of students in conditions of war stress.

Thus, multimedia platforms not only perform the function of distance learning, but also become an important tool for social and psychological support, allowing the integrity of the educational process to be maintained even in difficult and unpredictable conditions [4; 7].

Gaming technologies have a dual effect: they simultaneously develop cognitive skills and promote psychological relief, reducing stress levels and distracting students from negative external factors. According to S. Deterding [1], gamification is the application of game principles in a non-game context to increase user motivation and engagement. Recent studies show that gamification elements – rewards, points, ratings, difficulty levels, and interactive tasks – stimulate active student engagement in the learning process, increase the effectiveness of material assimilation, and shape positive learning behavior [1; 3; 9].

In the Ukrainian context, especially during wartime, gamification approaches take on additional socio-psychological significance. They help maintain student motivation and foster a sense of achievement and control over learning, even in conditions of instability or distance learning. The introduction of game mechanics into educational platforms allows learning material to be integrated into interesting and safe scenarios that combine learning with emotional release and social interaction. Thus, gamification not only increases the effectiveness of learning, but also contributes to the development of students' cognitive, motivational, and social competencies [1; 2; 8].

During wartime, gamification serves an additional function-it creates a safe environment for learning. Research by O. Romanyuk, O. Romanyuk and N. Velychko [9] shows that game elements stimulate an emotionally positive attitude toward learning, even when conditions are difficult. In the post-war period, such approaches can be useful for the rehabilitation of children and the development of stress resilience.

Research by S. Zvekova [8] underscores the significant potential of digital gaming environments, particularly for students with special educational needs. These interactive platforms provide adaptable, multisensory learning experiences that can be tailored to individual learning styles and requirements. In the disruptive context of wartime, where access to specialized institutions and resources is often severely compromised, such technologies become indispensable tools for promoting inclusiveness. They help bridge educational gaps by providing a flexible and engaging medium that can offer all students a more equitable opportunity to learn and participate.

Further building on the importance of connection, the work of M. Medvedeva, O. Zhmurko, I. Kryvoruchko and M. Kovtanyuk [10] identifies productive interaction as a cornerstone of effective distance learning. They argue that digital applications are vital not merely for content delivery but for facilitating collective forms of work-such as collaborative projects and peer-to-peer discussions-that replicate the social dimension of the classroom. This sustained contact between teachers and students, even across physical distance, is crucial for maintaining academic continuity and a sense of community, which are often fractured during crises.

Looking forward, multimedia tools are poised to play a transformative role in the reconstruction of education. As explored by A. Fefelov [11], the convergence of interactive presentations with emerging technologies like virtual reality (VR) opens up powerful new possibilities. These technologies can be leveraged to create immersive educational simulations, allowing students to safely engage with complex real-life scenarios or virtually explore cultural

heritage sites that may have been damaged or destroyed. Such experiences do more than convey information; they can foster a profound sense of cultural continuity and national identity by making history and shared heritage tangibly accessible.

In synthesis, the integration of virtual simulations and multimedia models offers a multifaceted solution for post-war recovery. This approach simultaneously supports the preservation of cultural heritage, enhances student motivation through immersive engagement, and strengthens national identity. By creating a dynamic and collaborative learning space, interactive technologies help students feel connected to a shared future. They stimulate essential cooperation between learners and educators, positioning themselves as an effective instrument for the holistic rehabilitation of the education system-one that supports both the cognitive advancement and the psychological well-being of a generation recovering from conflict.

Conclusions. The results obtained show that the use of interactive presentations and multimedia platforms in the educational process significantly increases the level of engagement, motivation, and cognitive activity of students. In this context, interactivity is not only a technical element but also a didactic principle that changes the nature of interaction between participants in the educational process.

In wartime, interactive tools serve as a stabilizing mechanism that ensures the continuity of education, compensates for the lack of live communication, and provides emotional support to pupils and students. In the post-war period, these technologies can become the basis for building a flexible, inclusive, and technologically modernized education system.

Further research should focus on developing interactive educational design models that combine multimedia tools, gamification mechanics, and analytical assessment tools. This will create a holistic digital environment capable of adapting to the needs of society in conditions of constant change and crisis challenges.

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