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## **THE USE OF ONLINE PLATFORMS AND DIGITAL TECHNOLOGIES IN EDUCATION DURING WARTIME**

**Abstract.** *The research examines the critical role that digital technologies and online platforms have played in maintaining the continuity of education during periods of armed conflict, with a particular focus on Ukraine's ongoing war. The study assesses how digital tools have supported both teaching and learning processes amid the war's challenges, evaluating their effectiveness, the barriers to their implementation, and the innovative strategies used to integrate them into the educational system. Furthermore, the research outlines the future of digital education in conflict-affected regions and its potential for shaping education in post-conflict reconstruction phases.*

**Keywords:** *digital education, online learning, war and education, technological adaptation, remote learning, education resilience, Russia-Ukraine war.*

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## **ВИКОРИСТАННЯ ОНЛАЙН-ПЛАТФОРМ ТА ЦИФРОВИХ ТЕХНОЛОГІЙ В ОСВІТІ ПІД ЧАС ВІЙНИ**

**Анотація.** *Стаття аналізує ключову роль цифрових технологій та онлайн-платформ у забезпеченні безперервності освіти під час збройних конфліктів, зокрема війні, що триває в Україні. Автори оцінюють, як цифрові інструменти підтримують процеси навчання та викладання в умовах викликів війни, аналізують їх ефективність, проблеми впровадження та інноваційні стратегії, що використовуються для інтеграції цих технологій в освітню систему. Крім того, робота окреслює перспективи розвитку цифрових технологій у навчанні в регіонах, постраждалих від конфліктів, та їх потенціал у формуванні освітнього процесу під час відновлення після конфліктів.*

**Ключові слова:** *цифрова освіта, онлайн-навчання, війна та освіта, технологічна адаптація, дистанційне навчання, стійкість освіти, російсько-українська війна.*

**Introduction.** The educational system is one of the most vulnerable sectors during wartime, with schools and universities frequently targeted in attacks. In Ukraine, the ongoing war has disrupted traditional face-to-face learning and forced the rapid adoption of digital technologies to sustain the educational process. By leveraging online platforms, educational institutions have adapted to the challenges posed by the war, ensuring that learning continues even under the most challenging conditions [1].

Historically, integrating digital tools into education was viewed as a progressive step to enhance learning experiences. However, the war has accelerated this technological shift, underscoring the importance of digital infrastructure for maintaining educational continuity in crises [2, 3].

The paper examines the strategies, tools, and outcomes associated with using online platforms and digital technologies in Ukraine's education system during the war.

Several studies have highlighted the crucial role of digital platforms in ensuring education during conflict. According to UNESCO [4], integrating digital education tools helps mitigate the impact of the physical destruction of schools, allowing displaced students to access educational resources remotely. However, the transition to digital education has its challenges. One of the main obstacles in conflict zones is unreliable internet access and the need for more infrastructure to support remote learning.

A report from the World Bank [5] emphasizes that while digital technologies have the potential to facilitate learning in emergencies, they also exacerbate inequalities in access to technology and the Internet. As seen in other war-torn countries, these disparities significantly hinder the learning process, as many students need the proper devices or stable internet connections.

As the conflict in Ukraine escalated, the government and educational institutions swiftly pivoted to digital learning solutions. Online platforms became essential to ensure that education could continue despite the disruptions caused by the war. Ukrainian schools and universities adopted various platforms to deliver lectures, assignments, and exams [6].

**Statement of the problem.** The rapid onset of the war in Ukraine disrupted traditional educational systems, forcing educators, students, and policymakers to adapt to digital learning environments quickly. As a result, integrating digital tools into the education system – long a goal in many countries – became an urgent necessity to ensure continuity in education during times of crisis. In Ukraine, the shift to online learning faced significant challenges, including unreliable internet access, limited infrastructure, and disparities in technology availability among students. These challenges were further compounded by the psychological and emotional toll of the war, which affected both students and teachers [7, 1].

The problem addressed by this research is the effectiveness and sustainability of digital education platforms in maintaining the quality of education in conflict zones, specifically within the context of the ongoing war in Ukraine. The study aims to explore how digital tools were utilized to continue education during the war, the barriers encountered in their implementation, and the outcomes of this shift in educational methodology. As noted [9], modern educational technologies rapidly develop, opening new opportunities for personalizing learning. Online courses and interactive platforms are becoming increasingly popular tools that allow students to learn at their own pace, choose methods that suit them, and receive personalized support. These advancements in digital learning have proven especially vital during challenging times, such as wartime, when traditional education systems are often disrupted. The use of online platforms and digital technologies in education during wartime allows for the continuity of learning, overcoming barriers such as physical distance, safety concerns, and limited access to in-person classes. By enabling flexible and accessible learning environments, these technologies help maintain educational progress and provide critical support for students and teachers, even in difficult circumstances.

**Research Results.** The research revealed several key findings regarding using digital tools in education during the Ukraine war. These results were based on a combination of qualitative interviews with educators, surveys of students and parents, and data from educational institutions regarding platform usage and learning outcomes:

**1. Widespread Use of Digital Platforms.** The study found that digital platforms such as Google Classroom, Zoom, Moodle, and Microsoft Teams were widely adopted across Ukraine's educational institutions, becoming essential tools for maintaining educational continuity during the war. These platforms provided teachers and students with the flexibility to adapt to the challenges posed by the conflict, enabling them to continue lessons, assign homework, and conduct assessments despite the ongoing disruption. Google Classroom, in particular, was noted for its user-friendliness, allowing teachers and students to navigate it with minimal technical training [8], which was crucial for those with limited experience in digital learning environments.

Additionally, platforms like Zoom facilitated real-time communication and virtual classroom interactions, helping to maintain a sense of normalcy and connection among students and educators. Moodle and Microsoft Teams were also utilized to organize course materials, track student progress, and facilitate group work and collaboration. Teachers reported that these

platforms ensured the continuation of the curriculum and provided essential features like file sharing, video conferencing, and real-time feedback, which contributed to a more interactive and engaging learning experience.

Despite the challenges of internet connectivity and digital inequality, adopting these platforms represented a significant shift toward digital education in Ukraine, offering a viable solution to the disruption caused by the war. The widespread use of these tools also highlighted the resilience of both educators and students, who quickly adapted to the new learning formats, demonstrating the transformative potential of digital technologies in crises.

*2. Challenges of Unequal Access.* One of the most significant challenges identified was unequal access to technology. According to survey data, about 40% of students in rural or conflict-affected areas lacked reliable internet access. In contrast, many others did not have personal computers or mobile devices suitable for online learning. This digital divide was particularly pronounced in the most war-impacted regions, where infrastructure damage and limited resources hindered the implementation of effective online education. As a result, students in disadvantaged areas were often left behind, unable to participate in lessons or complete assignments effectively, exacerbating educational inequalities.

Additionally, many students needed more technical skills to navigate online platforms, and some faced difficulties accessing learning materials due to slow or intermittent internet connections [10]. In cases where students had devices, they often had to share them with family members, limiting their learning time. This lack of access was more comprehensive than in rural areas. However, it was also prevalent in urban zones affected by the conflict, where power outages and damage to communication infrastructure made online learning unreliable.

Furthermore, economic factors often compound the disparity in access to educational technology. Many families, already burdened by the war's economic impacts, could not afford the necessary devices or high-speed internet subscriptions. The situation was particularly dire for low-income students who faced compounded challenges in accessing quality education. This inequality in access led to significant gaps in learning outcomes, creating long-term consequences for students' academic progress and future opportunities.

The challenges of unequal access to technology highlighted the need for targeted interventions to bridge the digital divide, such as providing students with subsidized devices, expanding internet infrastructure in rural and conflict-affected regions, and offering technical support to ensure that all students, regardless of their location or economic status, have an equal opportunity to participate in online learning.

*3. Psychological and Social Impact.* The research highlighted the psychological and social effects of online learning during the war. Many students experienced heightened stress, anxiety, and a sense of isolation, with limited opportunities for social interaction with peers and teachers [11]. Mental health support was inadequate, and educators reported difficulty maintaining students' motivation. This issue was especially pronounced among younger students, who lacked the emotional resilience to cope with the trauma of displacement and virtual learning.

The lack of face-to-face contact with teachers and classmates also contributed to feelings of detachment and loss, further exacerbating the emotional toll. Students who had experienced displacement or were living in areas under constant threat reported increased levels of fear and insecurity, which affected their ability to focus on learning. Moreover, the absence of in-person social support networks, such as friendships and teacher-student relationships, left many students without crucial emotional outlets, compounding the challenges of virtual education during such a traumatic period.

*4. Teacher Adaptability and Training.* The study showed that teacher adaptability played a crucial role in the success of online education [5, 7]. Teachers with previous experience

using digital tools could transition more smoothly, while those without this experience faced significant difficulties. To address this, educational institutions provided various training programs, which helped most educators improve their digital literacy and online teaching methods. However, many teachers still need help engaging students in an entirely digital environment, especially without face-to-face interaction.

Moreover, some teachers struggled with the technical aspects of managing online classrooms, such as troubleshooting platform issues and ensuring all students had equal access to learning materials. In some cases, the lack of sufficient time for preparation and the overwhelming emotional toll of the war made it difficult for teachers to fully embrace new digital teaching strategies, further impacting instruction quality.

5. *Academic Performance and Engagement.* Despite the hurdles, the research found that many students performed relatively well academically with access to reliable technology. Platforms like Moodle allowed for personalized learning paths, enabling students to learn independently. However, many students reported lower engagement levels and preferred in-person learning. Some students also reported difficulty concentrating during online lessons due to distractions in their home environment and the mental toll of the ongoing conflict.

Additionally, the lack of direct interaction with teachers and classmates contributed to decreased motivation and feelings of detachment. While some students thrived in the self-paced online environment, others struggled with isolation, missing traditional classroom settings' structure and social aspects.

6. *Opportunities for International Collaboration.* On a positive note, the research uncovered opportunities for international collaboration. Ukrainian students participated in online workshops, seminars, and collaborative projects with students from other countries. It helped them maintain a sense of normalcy and connectedness despite the war. These cross-cultural exchanges also exposed students to diverse perspectives, enriching their learning experience. Additionally, these collaborations provided Ukrainian students with a platform to share their experiences, fostering empathy and solidarity with peers worldwide. Such initiatives not only contributed to academic growth but also supported the emotional well-being of students by reinforcing their sense of belonging to a global community. Moreover, the international partnerships helped Ukrainian educators and institutions expand their networks, creating opportunities for knowledge exchange and long-term cooperation in the educational field.

7. *Future Implications and Recommendations.* The research concluded that while digital education has proven to be an effective tool for maintaining educational continuity during the war in Ukraine, its long-term sustainability depends on addressing challenges related to infrastructure, teacher training, and mental health support.

The experience of online education in Ukraine during the war has provided valuable lessons for future educational resilience. Moving forward, it will be necessary for governments and educational institutions to:

✓ *Invest in Digital Infrastructure.* Ensuring that all students have access to the necessary technology and internet connectivity is crucial for the success of digital education.

✓ *Provide Ongoing Teacher Training.* Educators must be continuously supported with professional development programs to use digital tools effectively.

✓ *Address Psychological Well-Being.* Mental health support and coping strategies should be integrated into educational programs to help students manage the emotional toll of conflict and online learning.

**Conclusion.** The quick adoption of online learning platforms during the war in Ukraine has been a critical response to the educational disruption caused by the conflict. Despite the challenges of unequal access to technology and infrastructure, digital tools have played an



essential role in keeping education alive, ensuring that students continue to learn even in the most challenging circumstances. Teachers have adapted quickly, often leveraging innovative approaches to engage students remotely, and institutions have demonstrated flexibility in their curriculum delivery.

Moving forward, the lessons learned from this period will shape how education systems worldwide adapt to crises, with a renewed focus on ensuring that learning continues, no matter the circumstances. The experience of Ukraine highlights not only the importance of technological resilience in education but also the need for robust systems that support access to digital learning tools for all students, regardless of their socio-economic background.

Moreover, this crisis has revealed the transformative potential of digital technologies in reshaping education systems, making them more inclusive, flexible, and adaptable to change. As the world faces increasing global challenges, including climate change, political instability, and pandemics, the ability to pivot to digital education will become an even more vital component of educational policy and strategy. The war in Ukraine has illustrated that digital education is no longer just a supplementary option but a fundamental pillar of future-proof educational systems. Integrating digital tools will ensure that students everywhere can continue their education, even in the face of adversity, and that learning remains uninterrupted during future global crises.

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