

**DOI 10.36074/logos-06.02.2026.042**

## DIGITAL PEDAGOGY IN UNCERTAIN TIMES: THE POTENTIAL OF ARTIFICIAL INTELLIGENCE TO ENSURE FLEXIBILITY IN THE EDUCATIONAL PROCESS

**Yuliia Rybinska<sup>1</sup>**

---

**1.** Doctor of Science (Dr Hab) in Education, Professor  
Department of Pedagogy and Educational Management  
*Odesa Regional Academy of In-Service Education, UKRAINE*  
**ORCID ID: 0000-0003-2185-7890**

---

The war has raised questions about the accessibility and safety of education. Many children have lost the opportunity to participate in the educational process, and teachers are teaching in regions where hostilities are taking place or could potentially take place, under the threat of shelling. Education in wartime is undergoing significant changes: the format of the educational process, curricula and learning conditions are changing, admission to higher education institutions has been simplified, and some academic and scientific institutions have been relocated to other regions. Due to the threat to life, fighting, and the temporary occupation of certain territories by the Russian Federation, a large number of students and teachers have been forced to evacuate within Ukraine or abroad. [2]. War significantly changes the usual way of life, creating challenges that affect both teachers and students. Such conditions require careful planning of educational processes and the provision of appropriate learning conditions in wartime. The education system operates in a state of constant uncertainty, which necessitates the search for flexible, adaptive approaches to organising the educational process.

In this context, innovative technologies and approaches in education are critical, as they enable the creation of an interactive environment for developing key competencies such as adaptability, problem-solving, and rapid response. Innovative teaching tools play an important role in creating a deep understanding of scientific concepts and critical thinking. This provides students not only with knowledge but also with the ability to apply it in real life, making learning engaging and accessible even in the difficult conditions of war.

The choice of educational form is primarily linked to the ability to ensure the safety of those involved in the educational process. Therefore, online learning has

**ABSCHNITT 21.**  
PÄDAGOGIK UND BILDUNG

become one of the forms of education. Online learning is a technological approach to open learning principles that widely uses computer-based learning programmes for various purposes and modern telecommunications to create an information-based educational space for the transfer of learning materials and communication.

The recent period, associated with the coronavirus pandemic and, currently, the war in Ukraine, has necessitated a rapid transition of the entire educational process to a distance-learning format, the maximum use of diverse multimedia content for educational purposes, and the intensification of the educational process through interactive teaching methods. However, distance learning under martial law is significantly different from what it was before the war. As practice has shown, distance learning in wartime cannot fully ensure the stability of education. The main risks are power outages or loss of Internet access, air-raid sirens, and the need to move participants in the educational process to shelters during classes for their safety.

During martial law in Ukraine, distance learning is being conducted in synchronous and asynchronous modes. Depending on their capabilities, students can attend classes online, study independently according to a developed programme, view webinar recordings, complete assignments and tests, consult with teachers via online chats, and periodically submit their work for review. If students are unable to attend classes online regularly, teachers build a kind of educational process constructor for them, which consists of their own content, namely, recorded lessons on Zoom, Microsoft Teams, or YouTube, with subsequent access provided to students. Teachers can also conduct classes with students and administer tests using online platforms such as Moodle, Microsoft Teams, Zoom, Google Meet, Google Classroom, and Edmodo. [4]

The concept of e-learning has gained global significance as a key tool for maintaining educational continuity during crises. The transition from traditional education to computer-based learning has been underway for more than two decades. Still, it was the rapid development of the global Internet that became the decisive factor in its scaling. Internet technologies, particularly the ability to instantly exchange data, communicate online, and access educational resources in open formats, have laid the foundation for transforming educational paradigms. The use of electronic learning materials, such as interactive and adaptive resources, promotes better assimilation of the material. Instead of traditional paper textbooks, electronic textbooks allow information to be updated more quickly and provide convenient access.

Interactive and game-based learning methods, such as video lectures, exercises, games, and virtual laboratories, make learning more engaging and compelling, promoting better assimilation of the material. Computer technologies

allow the creation of personalised learning paths for each student. Adaptive platforms can analyse student performance and provide materials that meet their needs and level of knowledge. [3]. E-learning plays a vital role in ensuring access to education, both in-person and remotely. One of the key advantages is unlimited access to educational resources, allowing students to view learning materials at a time convenient for them. The use of lecture recordings, interactive presentations, and digital libraries facilitates knowledge acquisition even without participating in real-time classes. In addition, I would like to note that the practice of online class broadcasting, adopted by many teachers, allows students to study regardless of their location, which is especially relevant in crises.

A significant advantage is the wide coverage of students. Digital technologies enable the organisation of the learning process for a large number of students regardless of their place of residence. The introduction of interactive trainers, simulators, mobile applications and testing platforms contributes not only to the acquisition of theoretical knowledge, but also to the practical development of skills.

The use of AI provides new opportunities for personalised learning, educational process analytics, routine task automation, increased knowledge accessibility, and the formation of a flexible educational ecosystem in the context of the crisis in Ukraine. The potential of AI is becoming particularly relevant as a tool for overcoming educational inequality, maintaining educational continuity, and fostering a new quality of education.

As the field of artificial intelligence is rapidly developing and relatively new, it remains under-researched, especially regarding its impact on education systems and the modernisation of post-war education in Ukraine. At the same time, AI is not only revolutionising education, but also changing our daily lives, transforming habits and expanding human potential. AI helps simplify the management of educational institutions by automating routine tasks such as student registration, assignment checking, grading, and scheduling. For example, platforms with automatic text analysis can significantly reduce the time spent checking written assignments. AI can act as a digital tutor that is available 24/7. For example, chatbots and voice assistants can answer students' questions in real time, explain complex topics, and help with assignments.

AI can adapt learning materials to a student's level of knowledge, increasing or decreasing task complexity, thereby significantly improving learning efficiency. In particular, the development of adaptive educational platforms – those that use AI to monitor the learning process and automatically adjust educational content to students' needs – has become an essential tool in online education. For example, platforms such as Coursera and Khan Academy use AI algorithms to create personalised learning paths.

**ABSCHNITT 21.**  
PÄDAGOGIK UND BILDUNG

AI can use information about a student's learning pace and learning characteristics to create personalised recommendations and assignments. Interactive learning systems, including chatbots and virtual assistants, provide students with instant answers to questions and support during their studies. Game-based learning methods using AI are also promising: AI in simulators (dispatcher, technological equipment operator, architect, surgeon, etc.) can help develop practical skills, for example, in medicine or engineering. Gaming platforms can adapt to each student's learning style, offering more effective learning methods. This is what individualisation of learning is all about.

As part of a comprehensive system – the information and educational environment of an academic organisation – AI can provide students with didactic material – cognitive and informative, or virtual and modelling – and automate the assessment of pupils' (students') knowledge using algorithms to analyse answers and support feedback channels. This process can be significantly faster and more accurate than traditional assessment.

AI-based systems can effectively search, filter, and systematise the necessary materials for studying a topic or preparing for a class. AI can automatically generate test questions, training exercises, and even educational videos and other interactive materials.

While emphasising the advantages of artificial intelligence, it is essential to note that its use contributes to personalised learning, as AI can provide individualised recommendations tailored to students' learning styles and rates of knowledge assimilation. In addition, automated assessment and feedback increase the speed and accuracy of the educational process, making it more intensive and efficient. Artificial intelligence also enhances accessibility by enabling flexible, personalised learning regardless of geographical location and by supporting learners with special educational needs.

The use of AI in the educational process can significantly increase the efficiency and speed of education, make it more accessible and flexible, and also ensure a personalised approach to each student. Every modern educational institution should have a comprehensive electronic information and educational environment (EIEE) in which AI would perform its specific tasks: providing educational material, virtual modelling of processes, consulting, working with databases, formal assessment of students' practical work, etc. The use of AI can be justified to relieve people (teachers, students, or administrators) of routine work, to establish contact with students studying remotely, and to provide teaching materials. However, it is important to remember that AI cannot be considered part of the teaching process but only an auxiliary tool. [1].

It is important to carefully address the ethical, humanistic, and technological issues arising from the integration of AI into education. It is necessary to maintain a balance between traditional teaching methods and new technologies. Students' personalities should be formed in a real community and in contact with real teachers. In the future, it is essential to develop AI in the educational process so that it is not seen as a convenient alternative to interaction between the teacher and the pupil (student), but rather as a complement, facilitator, and accelerator of the learning process. In addition, the specialisation of AI applications by profession and educational programmes is relevant.

The development of adaptive educational platforms based on generative AI opens new opportunities to create personalised learning pathways that account for each student's individual characteristics, learning styles, and learning pace. The systems can automatically analyse student progress and adjust learning content based on identified needs and weaknesses. Their technical implementation includes creating dynamic student profiles that integrate academic achievements, behavioural patterns, and psychological characteristics. These profiles are used to automatically generate personalised assignments, adjust the material's complexity, and recommend additional resources for in-depth study. A generative system based on artificial intelligence, designed to simulate a dynamic classroom environment, allowing teachers to participate in repetitive, targeted practical exercises. Using the latest advances in LLMs and multi-agent systems, the platform offers virtual student agents that demonstrate different learning styles, prior knowledge, and behavioural patterns. At the same time, mentor agents built on the same generative artificial intelligence technology provide constant feedback, allowing teachers to adapt their strategies in real time.

An analysis of the current state of AI implementation in education and science reveals a complex system of interrelated technological opportunities and challenges, requiring a balanced approach to integrating these tools into educational and scientific processes. The most significant potential of the technology lies in automating routine operations, creating personalised learning trajectories, and accelerating scientific discoveries through interdisciplinary data analysis.

It should be noted that the impact of AI on participants in the educational process covers a wide range of psychological aspects – cognitive, motivational, emotional and social. The effective use of technology requires a comprehensive combination of pedagogical skills, digital competence, and psychological support, which ensures the harmonious development of pupils and students and promotes the formation of critical thinking, independence, and readiness for professional activity in the modern digital environment.

**REFERENCES:**

- [1] Biletskyi, V. S., Onkovych, H. V., & Biletskyi, V. V. (2025). Mistse i rol shtuchnoho intelektu u systemi suchasnoho osvitnoho protsesu. *Geotechnologies*, (8), 11–17. <https://repository.kpi.kharkov.ua/handle/KhPI-Press/95214>
- [2] Melnyk, M. Yu. (2022). Osvita v umovakh voiennoho stanu: rezultaty opytuvannia. *Visnyk Natsionalnoi akademii pedahohichnykh nauk Ukrainy*, 4(1). <https://doi.org/10.37472/v.naes.2022.4130>
- [3] Umanets, V. O., Pavliuk, B. V., & Rozputnia, B. M. (2025). Elektronne navchannia yak instrument zabezpechennia yakosti osvity v umovakh voiennoho stanu. *Open Educational E-Environment of Modern University*, (18), 145. <https://doi.org/10.28925/2414-0325.2025.1812>
- [4] Yavorska, T. (2023). Tsyfrova transformatsiia osvitnoho protsesu v umovakh voiennoho stanu v Ukraini. *Vyshcha osvita Ukrainy u konteksti intehratsii do yevropeiskoho osvitnoho prostoru*, 91(II-1), 217–226. <https://doi.org/10.38014/osvita.2023.91.19>