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ARTIFICIAL INTELLIGENCE IN EDUCATION FOR SUSTAINABLE DEVELOPMENT: INTERNATIONAL PRACTICES AND UKRAINIAN DIMENSION IN THE CONTEXT OF WAR

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INTRODUCTION

Artificial intelligence (AI) is rapidly becoming one of the defining technologies of our time, dramatically changing various spheres of life, including education. It has been called the «disruptive innovation» of recent decades, as AI's capabilities promise unprecedented benefits in teaching and educating the next generation. At the same time, the intensive introduction of AI raises a number of philosophical and ethical questions for society: will we lose human uniqueness in education? will algorithms replace live thinking? how to maintain a balance between technological progress and humanistic values? In the context of war, these questions are particularly acute. Ukraine's educational system is facing severe challenges – from forced digitalization due to the pandemic to today's destruction and threats. However, it is at this crucial time that AI can become both a lifeline and a kind of «test of maturity» for the educational community. After all, artificial intelligence is both a source of new opportunities and a «transformational challenge» for national education systems, as its impact can radically transform the content of the educational process and even question traditional approaches to knowledge assessment[1]. In these circumstances, it is crucial to understand the role of AI in education from the perspective of sustainable development, i.e., development that ensures quality, inclusive, and sustainable education even in the face of the most significant challenges.

The article analyzes the use of AI in education, combining international experience and Ukrainian realities. About 40% of the content is focused on global trends and practices, while 60% is devoted to the experience of Ukraine, which is striving to ensure the sustainable development of the education sector despite the turbulence of wartime. A brief introduction outlines the issues and context; then two main paragraphs cover international practices of using AI in education and Ukrainian experience and perspectives,

[1] Малиношевський Р. Штучний інтелект і політики нівелювання соціальних ризиків: виховний контекст. *Теоретико-методичні проблеми виховання дітей та учнівської молоді.* 2023. №27(2). С.25–37. DOI: 10.32405/2308-3778-2023-27-2-25-3

respectively; finally, conclusions are drawn and an annotation summarizing the main points of the chapter is offered.

1. International experience in implementing artificial intelligence in education

1.1. Global trends: AI opportunities for education and regulatory challenges

On the global stage, more and more countries and educational systems are experimenting with the introduction of AI as a catalyst for educational change. Intelligent learning systems, personalized chatbot tutors, adaptive learning platforms, and automated assessment tools are being developed. For example, in 2023, Khan Academy, a non-profit organization in the United States, launched an experimental AI module called Khanmigo, which acts as a personal online tutor for students, able to answer questions and give suggestions no matter how many times it is needed to understand the material[2]. Such systems pave the way for the realization of the long-standing dream of pedagogy – individualized learning, where each student receives support and pace that is optimal for him or her. AI can take on the role of a patient tutor that can explain the material an unlimited number of times and in different ways until the student masters the topic. Thus, the technology has the potential to promote deeper and more sustainable learning, expand access to education (especially for those who need additional assistance), and allow teachers to focus on the creative aspects of teaching.

At the same time, it is globally recognized that the rapid entry of AI into the educational space poses new challenges for policy makers and communities. Leading international organizations call for responsible and ethical use of AI in education. In September 2023, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) published the first global guidelines on generative AI in education and research[3]. UNESCO called on governments to develop strategies and regulatory measures for the safe integration of AI: to ensure data and privacy protection, copyright compliance, age restrictions for users, and most importantly, to ensure that teachers have the necessary skills to work with new technologies. UNESCO representatives compare the current stage to the discussion that once took place around calculators: at first they were perceived with caution, and later they became an indispensable tool in the classroom. Similarly, AI can

[2] Горбік В. Вчителі програють блогерам і медійним персонам. Які проблеми та користь несе штучний інтелект в українській освіті та чи є панацея для її розвитку. URL: https://dev.ua/news/problemy-ta-koryst-ai-v-osviti

[3] ЮНЕСКО. Рекомендації щодо генеративного ШІ в освіті, 2023. URL: https://unesdoc.unesco.org/ark:/48223/pf0000386693

eventually integrate seamlessly into educational process, but only if it is used consciously.

It is especially emphasized that providers of AI solutions for education should be responsible for adhering to basic ethical principles and preventing harm. «Providers of generative artificial intelligence should ensure that core values and legitimate aims are upheld, that intellectual property and ethical practices are respected, and that the spread of misinformation and hate speech is prevented,» UNESCO emphasizes. This means that AI-based tools implemented in schools and universities should be transparent in their algorithms and data, free of bias, and their use should be aimed at student's benefit. Another important principle is to avoid scenarios where AI deprives students of the opportunity to develop their own thinking and social skills. The recommendations emphasize that AI should not be used where it replaces live learning experiences such as observing the real world, practical experiments, discussions with other people, and independent logical reasoning[4]. Education is designed to form a personality, and interacting only with a digital mind without engaging in real-world experience can lead to impoverishment of students' development.

In response to these challenges, some countries are already implementing policies that regulate the place of AI in educational systems. The example of Australia is illustrative: after a period of partial bans on the use of ChatGPT in schools, in autumn, 2023, the Australian government unanimously approved a national framework program and allowed the use of artificial intelligence (including generative models like ChatGPT) in all schools in the country starting from 2024[5]. Australian Minister of Education Jason Clare explicitly stated that new technologies «will not disappear» and have become something like «a calculator or the Internet» for students, so instead of bans, it is necessary to learn how to use them correctly. At the same time, Australian education authorities noted that a complete ban on AI would only increase inequality, as private school students would still have access to digital assistants, while the public sector would lag behind. Thus, the adopted strategy envisages providing controlled access to AI for all students, developing educational materials on its safe use, and investing in infrastructure and services to ensure that the integration of technology is equitable and takes into account all stakeholders' interests. This case demonstrates a general global trend: from containment to adaptation. Initially,

[4] ЮНЕСКО. Рекомендації щодо генеративного ІІІ в освіті, 2023. URL: https://unesdoc.unesco.org/ark:/48223/pf0000386693

[5] The Guardian. Artificial intelligence such as ChatGPT to be allowed in Australian schools from 2024 (Oct 6, 2023). URL: https://www.theguardian.com/australia-news/2023/oct/06/chatgpt-ai-allowed-australian-schools-2024

the emergence of powerful AI models in education caused a «reflex of prohibition» (they were afraid of mass cheating, a drop in the level of knowledge, etc.), but later it became clear that it was more rational to accept the challenge and find a way for human and machine coexistence in the learning process.

Another important international trend is inclusion of AI issues in high-level educational programs and policies. In the United States, the Department of Education released a special report in 2023, Artificial Intelligence and the Future of Teaching and Learning, which outlines the potential benefits of AI for personalizing learning, as well as the risks associated with student data privacy and possible algorithmic biases. The European Union, as part of its Digital Education strategies, also emphasizes the development of digital competencies, including a basic understanding of AI in school curricula, so that young people are prepared to live and work in a world where artificial intelligence will «act» alongside them. The general opinion voiced, in particular, in the UNESCO Global Report 2023 is that the education system should teach children to live with and without technology, while maintaining critical thinking and humanity[6]. That is, the goal is not just to introduce fashionable novelties, but to form meta-literacy in new generations – the ability to use AI as a tool without losing their own intellectual autonomy.

1.2. Ethical and philosophical aspects: from risks to new pedagogy

Like any powerful technology, artificial intelligence in education is a double-edged sword. On the one hand, it can greatly enhance human intelligence – expanding students' cognitive capabilities, providing unprecedented tools for creativity and research, and helping to overcome inequality in access to quality education. On the other hand, the uncritical or premature introduction of AI carries social and pedagogical risks. Some researchers warn that the algorithms on which AI systems are built reflect the biases and values of their creators or training data samples[7]. Relying on AI recommendations and decisions without proper understanding can inadvertently reinforce existing social inequalities or even discrimination. For example, an algorithm may refuse to admit an applicant to a program because of correlations that seem statistically significant but are actually unfair (the so-called «algorithmic bias»). In the educational context, there is a concern

[6] The Guardian. Artificial intelligence such as ChatGPT to be allowed in Australian schools from 2024 (Oct 6, 2023). URL: https://www.theguardian.com/australia-news/2023/oct/06/chatgpt-ai-allowed-australian-schools-2024

[7] Малиношевський Р. Штучний інтелект і політики нівелювання соціальних ризиків: виховний контекст. *Теоретико-методичні проблеми виховання дітей та учнівської молоді.* 2023. №27(2). С.25–37. DOI: 10.32405/2308-3778-2023-27-2-25-3

that automated systems of knowledge control, progress analysis, etc. can create an atmosphere of total surveillance, where every step of a student is tracked and evaluated by a machine. This jeopardizes trust in the teacher-student relationship and can inhibit freedom of thought.

Philosophers of education also emphasize the threat of alienating students from the process of acquiring knowledge. If AI assistants are too accessible and omnipotent, there will be no incentive to put in the effort to solve complex problems – why think when the machine will give you the answer instantly? For example, in a popular discussion on Reddit, one user complained that his 11-year-old sister does almost all her homework with ChatGPT, even simple calculations, by «stupidly copying and pasting» the answers instead of learning to think for herself[8]. This story reflects a real dilemma: while some students creatively use AI for self-development (e.g., looking for new ideas or additional information outside the program), others may be tempted to take the path of least resistance – to entrust the entire routine and even more to a smart machine. Educators in different countries are now hotly debating how to prevent the generation raised with ChatGPT from losing basic thinking and learning skills.

The key to solving these problems is the development of critical thinking and updating educational methodology. AI should not be a replacement but a tool in the hands of a thinking person. As Ukrainian researcher Svitlana Babiychuk aptly noted, «we should not use AI technologies and think of them as a panacea». An automated advisor can be wrong, and millions of users have already seen this: chatbots sometimes come up with unreliable «facts» or make mistakes in calculations with complete confidence. That's why students and teachers need to learn how to interact with AI correctly: check its answers with other sources, ask additional clarifying questions, and ask for justification and explanation of the logic of the decision[9]. This approach not only protects against mistakes but also develops students' ability to analyze information and compare different points of view, which ultimately also promotes critical thinking.

On the other hand, philosophizing the role of AI, educators come up with the idea of a new partnership between humans and machines in education. If a computer in the classroom used to be just a training tool or a source of information, modern AI can become an interlocutor and co-author in the learning process. This requires new pedagogical approaches. For example, instead of forbidding students to use ChatGPT when completing assignments,

[8] ChatGPT: як змінюється цифрова освіта? URL: https://dev.ua/news/chatgpt-1736353170

[9] Горбік В. Вчителі програють блогерам і медійним персонам. Які проблеми та користь несе штучний інтелект в українській освіті та чи є панацея для її розвитку. URL: https://dev.ua/news/problemy-ta-koryst-ai-v-osviti

a teacher can integrate its use into the structure of the task: offer to get an answer from AI first, and then analyze together in class where the algorithm made a mistake, what alternative solutions it did not take into account, or even how it formulated the thesis and whether there is any bias. This method transforms the potentially passive consumption of ready-made answers into active research, learning through error detection and discussion.

The global experience already offers interesting practices. At Harvard University, students were assigned to develop an education policy in one of the courses, and then the professors suggested using AI for a multi-stakeholder analysis: students had to ask a chatbot what the strengths and weaknesses of their policy were, how different stakeholders would evaluate it – the UN, UNESCO, government, teachers, students, etc.[10]. This technique allowed us to look at our own development from different angles and identify unusual aspects that the policy makers might not have thought about. In other words, artificial intelligence has become a kind of «mirror» that reflects the opinions of many experts simultaneously, encouraging students to critically rethink their work. This example illustrates the possibility of positive synergy: human intelligence + machine intelligence in cooperation can achieve a deeper result than either one alone.

At the same time, educators emphasize that to use AI effectively and safely, students need to develop qualities that cannot be replaced by the machine. In particular, in the digital age, so-called soft skills are becoming even more important: creative imagination, teamwork, communication, and emotional intelligence. AI can suggest ideas, but only humans are capable of true creativity, of creating something fundamentally new; AI can imitate a dialog, but it cannot feel empathy or real emotions. Therefore, the education of the future should pay more attention to the development of creativity, cooperation, and social skills. As Svitlana Babiychuk aptly put it, today children need not only to be able to communicate through emojis in messengers, but also not to lose the skill of the living word: to formulate and defend their own opinions, to clearly structure information, to argue their position and convincingly convey it to others[11]. These skills are critical for both civic life and professional fulfillment, so training them is a response to automation that will «do routine things for you.» After all, in the AI era, humans must retain the role of carriers of meanings and values, not just consumers of ready-made answers.

[10] Горбік В. Вчителі програють блогерам і медійним персонам. Які проблеми та користь несе штучний інтелект в українській освіті та чи є панацея для її розвитку. URL: https://dev.ua/news/problemy-ta-koryst-ai-v-osviti

[11] Ibid

Thus, in the global dimension of the application of artificial intelligence in education, a dual approach is being formed: technological integration + ethical reflection. International experience shows that AI can be a powerful tool for achieving the Sustainable Development Goals in education, from improving the quality of learning (UN Goal 4) to reducing inequality in access to knowledge (Goal 10). But for this promise to become a reality, the right conditions need to be created: policies and standards need to be developed, teachers need to be trained, infrastructure needs to be prepared, and curricula need to be adapted. In the next section, we will look at how these tasks are being solved in Ukraine, a country that, despite the war, is striving to keep up with global trends and even offer its own innovations in the field of AI and education.

2. Ukrainian Experience: Implementation of AI in Education in the Context of War

2.1 Digital transformation of education: policies and initiatives

In recent years, Ukraine has taken significant steps towards digitalizing education, laying the foundation for the introduction of artificial intelligence technologies. Even before the full-scale war, it was realized that the digital competencies of teachers and students are a prerequisite for the sustainable development of the education sector. In 2021, the Cabinet of Ministers of Ukraine approved the Concept for the Development of Digital Competencies and the Action Plan for its implementation. This strategy aims to cover all segments of the population with digital education – from school courses to adult programs – with a special emphasis on critical skills of the 21st century. According to the Concept, information and media literacy classes are being introduced in schools, and curricula are being updated to ensure that graduates are prepared for the challenges of the digital economy. A key component is teacher training: the state conducts trainings and creates online courses for teachers on the use of modern ICT in the educational process. Such a set of measures is expected to help bridge a digital divide between urban and rural areas and between different social groups, ensuring equal access to innovations for every student.

In parallel with the increase in general digital literacy, Ukrainian educational policy began to directly address the issues of artificial intelligence and academic integrity. At the turn of 2023–2024, the Ministry of Education and Science of Ukraine (MES) issued Order No. 1759 of December 18, 2024, which approved the Standard Program for Advanced Training of Teachers in

Academic Integrity[12]. This program is designed to equip teachers with methods and knowledge necessary to maintain integrity in the conditions of digital learning. In fact, it is about adapting teachers to the realities where students have access to neural network text generators, translators, tutors and other services that can be used both in a positive (learning, self-development) and negative (plagiarism, copying) way. The Academic Integrity Program focuses on two aspects: on the one hand, to teach teachers to effectively use digital tools (electronic platforms, online classes, tools for checking texts, etc.); on the other hand, to develop their skills to identify academic violations and prevent dishonesty among students in the digital environment. Particular attention is paid to the issue of plagiarism and automated generation of works: teachers are introduced to modern anti-plagiarism programs, didactic techniques that make mechanical copying impossible (for example, an emphasis on project-based, creative tasks that require personal contribution from the student). This initiative of the Ministry of Education and Science reflects the understanding that AI has already entered educational life, and it is necessary to learn to live with it, maintaining ethical norms. Thus, Ukrainian educational policy is gradually creating a framework for the integration of AI: through teacher training, through updating standards and curricula, through cooperation with the IT sector.

It is worth noting that both the Ukrainian IT sector and the state are in a dialogue on the implementation of AI solutions in education. In February 2025, the Ministry of Digital Transformation (Mintsifra) announced an ambitious goal: to enter the top 3 countries in the world in terms of the level of integration of AI solutions by 2030. In this context, the first AI Center of Excellence in Ukraine was opened – a center of competence in artificial intelligence, which will become a hub for the development and implementation of AI projects in various fields, including education[13]. One of the pilot projects of the center, which is already in the beta testing stage, is the educational application «Mriya». «Mriya» is a digital platform for schoolchildren, in which it is planned to integrate an AI assistant. With the help of this assistant, individual educational trajectories will be built for

[12] Про затвердження Типової програми підвищення кваліфікації педагогічних працівників з академічної доброчесності: Наказ МОН України від 18.12.2024 р. №1759. URL: https://mon.gov.ua/ua/npa/pro-zatverdzhennya-tipovoyi-programi-pidvishhennya-kvalifikaciyi-pedagogichnih-pracivnikiv-zakladiv-zagalnoyi-serednoyi-osviti-z-akademichnoyi-dobrochesnosti

[13] Про затвердження Типової програми підвищення кваліфікації педагогічних працівників з академічної доброчесності: Наказ МОН України від 18.12.2024 р. №1759. URL: https://mon.gov.ua/ua/npa/pro-zatverdzhennya-tipovoyi-programi-pidvishhennya-kvalifikaciyi-pedagogichnih-pracivnikiv-zakladiv-zagalnoyi-serednoyi-osviti-z-akademichnoyi-dobrochesnosti

children – that is, the curriculum will be adjusted to the needs, abilities and interests of a particular child[14]. In fact, «Mriya» should become the Ukrainian analogue of an intelligent tutor: the student will be able to receive tips on academic subjects, additional materials for deepening knowledge, recommendations on the course of study depending on his progress. The project is being implemented in cooperation with the state and leading IT companies, in particular, a partnership with Google has been announced to integrate their AI developments on the «Diya.Osvita» platform[15]. If «Mriya» is successfully implemented, Ukrainian schools will receive a powerful tool for personalizing learning, which is especially relevant in conditions when many children are forced to study remotely or change schools due to relocation.

In the Ukrainian educational community, research into the experience of using AI has also become more active. Scientists analyze foreign practices and offer recommendations for Ukraine. For example, in 2023, a series of works was published (S.Tolochko, A.Godunova, etc.) devoted to the theoretical and methodological analysis of the use of AI in education and science in different countries. The authors draw attention to the fact that abroad the issue of ethics in the use of AI in education is one of the key ones: ethical codes are being formed for the use of AI technologies in universities, trainings are being conducted for students on how to correctly refer to AI-generated content so that it is not considered plagiarism. This experience is also useful for Ukrainian universities: for example, some universities have already approved their own regulations on academic integrity that take into account the existence of generative models (rules on the use of translators, a ban on submitting a thesis written entirely by AI without proper editing, etc.)[16].

So, despite the difficult conditions, Ukraine is laying the regulatory and technological basis for the integration of artificial intelligence into education. The combination of the efforts of the Ministry of Education and Science (in terms of methodologies and standards), the Ministry of Digital Affairs (in terms of infrastructure and projects), and scientists and teachers (in terms of research and implementation in practice) creates the prerequisites for AI to become a support for the educational process, not a threat. However, what

[14] Горбік В. Вчителі програють блогерам і медійним персонам. Які проблеми та користь несе штучний інтелект в українській освіті та чи є панацея для її розвитку. URL: https://dev.ua/news/problemy-ta-koryst-ai-v-osviti

[15] У 2025 році Мінцифри планують спільно з Google впровадити ШІ в Diia.Освіта» URL: https://dev.ua/news/u-2025-rotsi-mintsyfry-planuie-spilno-z-google-vprovadyty-shi-v-diiaosvita-1737650073

[16] Толочко С. В., Годунова А. В. Теоретико-методичний аналіз закордонних практик використання штучного інтелекту в освіті й науці. *Вісник освіти та науки*. 2023. № 7(13). С. 832–848. https://doi.org/10.52058/2786-6165-2023-7(13)-832-848

does this look like directly «in the field» – in schools, classrooms, during learning? Let us consider further how Ukrainian students and teachers are already interacting with AI and what features this process has in wartime conditions.

2.2. Practices and experiences: how Ukrainian teachers and students use AI

Over the past two years, the Ukrainian educational community has seen for itself that the «boom» of artificial intelligence has reached our schools and universities. According to surveys conducted in 2023, more than 80% of Ukrainian teachers and more than 90% of students have at least heard of AI or have encountered its use in one way or another[17]. Moreover, the majority of surveyed students (78%) admit that they use AI regularly, and about 70% have used it to complete homework assignments. Interestingly, children often use smart algorithms not only for cheating, but also for self-development: they look for additional explanations of complex topics, generate ideas for creative projects, practice solving tasks, receiving tips from a chatbot. More than 30% of students reported that they use AI to optimize their learning – for example, they automatically create summaries of large texts or ask the system to generate test questions for self-testing. Thus, we can say that the rising generation has mastered the new tools quite quickly.

Ukrainian teachers are also showing interest in the possibilities of AI, although their experience so far varies. On the one hand, there are enthusiasts who are experimenting with ChatGPT or similar tools: they use it to prepare materials for lessons, generate task options, check student answers, etc. For example, some teachers note that the chatbot helps them come up with creative questions based on the text, test options, or even explain a complex topic in simpler words – a kind of «brainstorming» for the teacher. The idea of giving students a task has become popular: to write an essay on their own and compare it with an essay generated by AI – in order to analyze the strengths and weaknesses of both approaches. This technique not only teaches students to read texts critically, but also motivates them to write better than a machine.

On the other hand, there are many teachers who are still afraid or distrustful of AI. Some fear that students will start cheating en masse or lose their writing and arithmetic skills. Others simply do not have the time and resources to deal with new technologies in detail – especially in wartime, when the main challenge is simply to maintain the continuity of education. As

[17] Горбік В. Вчителі програють блогерам і медійним персонам. Які проблеми та користь несе штучний інтелект в українській освіті та чи є панацея для її розвитку. URL: https://dev.ua/news/problemy-ta-koryst-ai-v-osviti

noted by Ukrainian researcher Lidia Davybida, the results of a survey of ~1,500 teachers across Ukraine revealed that the spread of AI among educators is relatively uniform, regardless of the region of residence[18]. That is, interest is present everywhere, but its depth depends more on the individual level of digital literacy of the teacher than on external conditions.

Of course, the war left its mark. Due to constant stress, anxiety, and sometimes power outages (blackouts), many teachers were physically unable to master new IT tools in 2022–2023[19]. The priority was to at least get in touch with the class and conduct a lesson online or offline despite the sirens. However, even in such difficult conditions, there are examples of Ukrainian educators showing ingenuity and perseverance. Some young computer science or English teachers who had the appropriate skills began to independently conduct workshops for colleagues on how to apply AI in teaching to reduce the workload. The well-known online educational platform «Na Urok» in 2023 launched the first Ukrainian-language educational chatbot based on GPT, which simulates communication with prominent historical figures. A history teacher could, for example, offer students to «interview» Taras Shevchenko or Anna Yaroslavna through this chat – an interesting interactive activity that simultaneously shows the possibilities and limits of AI (after all, the answers are generated by a machine based on the learned information). Such tools, on the one hand, relieve the teacher, and on the other, allow students to delve deeper into the subject through play[20].

The experience of Ukrainian students and teachers confirms: AI in education is a reality that cannot be ignored. It is important that many are beginning to understand: success does not depend on the technology itself, but on the culture of its use. Students focused on learning use ChatGPT as a tutor, not a «magic wand» for copying. Teachers who strive for development perceive AI as an assistant, not an enemy. Even problem cases (such as the aforementioned 11-year-old girl who does not want to count without a chatbot) become an occasion for a serious conversation about motivation and teaching methods in the new conditions. Educators note: if you simply forbid children to use AI, it will rather push them to do it secretly and uncontrollably. On the other hand, if you openly discuss and show where AI is wrong, what it cannot do, children begin to understand the limits of technology and learn not to blindly trust everything that a computer gives out.

[18] Горбік В. Вчителі програють блогерам і медійним персонам. Які проблеми та користь несе штучний інтелект в українській освіті та чи є панацея для її розвитку. URL: https://dev.ua/news/problemy-ta-koryst-ai-v-osviti

[19] Ibid

[20] Освітній чат-бот, 2023. «На Урок» розробив перший освітній українськомовний чат на основі ChatGPT. – URL: https://naurok.ua/post/Pershiy-chatbot-vid-naurok

The emphasis on academic integrity is very telling. Ukrainian schoolchildren and students, as a survey by the Small Academy of Sciences showed, mostly understand that copying from AI «word for word» is wrong. Many of them use it to draft ideas or a general direction, but then rework the text themselves. Of course, there are those who abuse it, but in general, the culture of honesty in education remains a value. University teachers say from their own experience: works generated entirely by a neural network are usually visible – they are too formulaic, often with factual errors or illogical constructions. Therefore, students quickly understood: it is easier to spend a little time editing and adding your thoughts than to hand in a «raw» AI text and get a low grade or rewriting. Therefore, AI can even help to educate responsibility: it presents an idea, and the responsibility for the final result still lies with the person, and this is clearly discussed in the educational process. In the context of war, the use of AI in education in Ukraine has acquired another dimension – supporting psychological and pedagogical resilience.

When an educational institution may come under fire or be forced to relocate, digital tools become life-saving. Online platforms, interactive courses, electronic libraries – all this allows you to continue learning even without the usual school building. Artificial intelligence complements the picture: for example, chatbot consultants can answer students' questions at any time when the teacher is physically unavailable; automatic translation and voice-over systems help those who have been forced to go abroad to study according to the Ukrainian curriculum, overcoming language barriers. And although these solutions are not perfect, they give the feeling that «education has not abandoned children». A demonstration initiative is the savED project together with the IT company EPAM, which created the world's first underground school for children in frontline areas[21]. A whole range of technologies are used there, including digital devices with educational applications that can work offline. The goal is to ensure continuity of learning even during airstrikes. AI in such conditions can take on the role of a psychological and pedagogical supportive environment: for example, adaptive curricula adjust to the student's pace if he or she missed a class due to danger, and help them catch up without feeling like a failure.

It is important that Ukrainian education experts are optimistic about the future. As Svitlana Babiychuk noted, after going through the pandemic and the war, the Ukrainian education system did not break down, but on the contrary, it became more flexible and resilient than many expected. They consider artificial intelligence as one of the tools for overcoming the «educational losses» caused by the upheavals of recent years. But for this, it

[21] Освіта не може чекати: як savED і EPAM разом створили підземну школу, 2023. URL: https://dou.ua/lenta/articles/saved-epam-underground-school

is necessary to raise awareness among teachers and students about the capabilities of AI and the rules for its ethical use. Experts emphasize that trainings, courses, and information campaigns are needed so that those who work or study at school understand how to correctly apply new tools and where to rely on traditional methods. Financing is also extremely relevant: without investments in technological infrastructure (servers, the Internet, devices) and in the remuneration of specialists who implement innovations, even the best strategies will remain on paper. Here, sustainable development again comes to the fore – educational initiatives must be supported with resources, otherwise they will fade away[22]. Despite all the difficulties, faith in the future of Ukrainian education is justified. There is an opinion that in a few years, Ukraine's experience – how it managed to maintain and update education during the war – will be studied abroad as a unique example of the education system's resistance to grandiose challenges. Artificial intelligence, integrated intelligently and responsibly, may become one of the reasons for such resilience. Already now, we see the sprouts of a new education system: more flexible, digitally savvy, open to experiments and at the same time deeply humanistic. The lessons learned from this period are invaluable. They show that education as a phenomenon is stronger than circumstances – it is able to adapt and continue to develop even when «the earth shakes under its feet». And technologies, in particular artificial intelligence, only enhance this resilience if guided by a wise hand.

CONCLUSIONS

The use of artificial intelligence in education is a multifaceted phenomenon that combines a scientific and technological breakthrough with deep philosophical questions. International experience shows the enormous potential of AI to improve the quality and accessibility of education: intelligent tutors can personalize learning, automated systems can free up teachers' time from routine, analytical platforms can help identify gaps and needs in educational processes. At the same time, the global community has recognized that this process requires ethical «safety barriers»: necessary regulations, teaching digital culture, countering possible negative consequences (the spread of disinformation, academic dishonesty, technocentrism in education). Philosophically, AI forces us to rethink the goals of education: what does it mean to «know» and «be able» in an era when factual knowledge is available at the click of an algorithm? The answer is to shift the emphasis to the development of competencies that the machine does

[22] Горбік В. Вчителі програють блогерам і медійним персонам. Які проблеми та користь несе штучний інтелект в українській освіті та чи є панацея для її розвитку. URL: https://dev.ua/news/problemy-ta-koryst-ai-v-osviti

not have – critical thinking, creativity, emotional intelligence, ethical awareness. The Ukrainian experience of implementing AI in education in wartime is a story of challenges and responses to them. Despite the devastating circumstances, Ukraine not only supports the educational process, but also tries to make a qualitative leap in its modernization. State politicians are laying the foundation for a digital breakthrough: from national programs for the development of digital skills to specific projects like «Mriya» or educational chatbots. Ukrainian teachers and students demonstrate the ability to adapt quickly: the uniform spread of knowledge about AI throughout the country, the active use of its tools by those who are motivated to learn, and at the same time maintaining an understanding of the value of one's own intelligence and integrity. The war hit education hard – anxiety, relocation, stress – but did not break it. On the contrary, educators are rallying, looking for new methods, borrowing the best from world experience so that learning continues. Artificial intelligence in this situation has become both a test and a salvation. It has tested our ability to change, and we have shown this ability. It has also become a salvation where human resources are lacking: it has helped to provide distance learning, provided additional hands (or rather «minds») to teachers, and supported students in self-education. From a philosophical point of view, Ukraine's experience confirms: sustainable development of education is possible even in turbulent times, if there is openness to innovations and loyalty to human values. Sustainable development is not about static stability, but about dynamic balance, the ability to evolve while preserving its essence. Ukrainian education, by letting artificial intelligence into its space, is trying to preserve the soul of education –upbringing of the individual, transmission of culture, formation of a citizen. With the support of the international community, a confident strategic course of the state and the tireless enthusiasm of educators, AI technologies can become a strong shoulder on which our education system will lean on the path of recovery and growth. After all, humanity and technology should not oppose, but complement each other. Then the school of the future will remain a school of Man, even if a smart machine sits next to it.

SUMMARY

The section is devoted to an in-depth analysis of the role of artificial intelligence (AI) in education in the context of sustainable development of Ukraine during the war. It examines international trends in the implementation of AI in the educational process and the ethical challenges that accompany them: from the personalization of learning to issues of academic integrity. It shows that the world community is developing recommendations for the safe integration of AI (UNESCO, government policies) and is adapting from the

first prohibitions to the productive coexistence of man and machine in education. The main attention is focused on the Ukrainian experience: despite the military threats, Ukraine is actively digitizing education (state programs, Mriya project, educational chatbots), and teachers and students are mastering AI tools. Data on the use of AI by Ukrainian schoolchildren is presented, advantages (individualization, accessibility of knowledge), risks (copying, loss of skills) and ways to overcome them are outlined. It is emphasized that in wartime conditions, AI helps to maintain the continuity of education, while simultaneously testing the system for strength. The philosophical leitmotif of the chapter is the thesis about the need for a harmonious synthesis of humanity and technology: sustainable development of education is possible under the condition of ethical use of AI, when technologies serve to enhance human creative and critical thinking, rather than replacing it.

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