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MACHINE INTELLIGENCE RESHAPING THE EDUCATIONAL LANDSCAPE (A THEORETICAL PERSPECTIVE)

ТЕОРЕТИЧНЕ ОБГРУНТУВАННЯ НЕОБХІДНОСТІ ВИКОРИСТАННЯ ШТУЧНОГО ІНТЕЛЕКТУ В ОСВІТНЬОМУ ПРОСТОРІ

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The relevance of the topic lies in the explanation that the modern world is rapidly changing under the influence of technological progress, and education cannot be left aside from these transformations. The integration of artificial intelligence (AI) into the educational space is one of the key directions of modernization of education, which allows it to adapt it to the needs of the new generation and increase the efficiency of the educational process. AI offers a wide range of tools and opportunities for improving education, from personalizing learning to automating routine tasks. The purpose of the article. – to theoretically substantiate the need to use AI in the educational space. It reveals the advantages of AI for various aspects of the educational process and analyzes its existing capabilities for creating a more effective, personalized and inclusive learning environment. To achieve the goal, the article used a set of scientific research methods. also, an analysis of scientific literature on artificial intelligence and its application in education was conducted, a truly comparative analysis of different approaches to integrating AI into the educational process was carried out, and the synthesis, generalization and systematization of the data obtained were performed. The article considers the theoretical aspects of the use of AI in education, identifies its key advantages.

Keywords: artificial intelligence, education, innovations in education, personalization of learning, efficiency.

Актуальність теми полягає у поясненні того що сучасний світ стрімко змінюється під впливом технологічного прогресу, і освіта не може залишатися осторонь цих трансформацій. Інтеграція штучного інтелекту (ШІ) в освітній простір є одним із ключових напрямків модернізації освіти, що дозволяє адаптувати її до потреб нового покоління та підвищити ефективність навчального процесу. ШІ пропонує широкий спектр інструментів та можливостей для покращення освіти, від персоналізації навчання до автоматизації рутинних завдань. Мета статті. - теоретично обґрунтувати необхідність використання ШІ в освітньому просторі. Вона розкриває переваги ШІ для різних аспектів освітнього процесу та аналізує його потенційні можливості для створення більш ефективного, персоналізованого та інклюзивного навчального середовища. Для досягнення поставленої мети в статті використано комплекс методів наукового дослідження. Зокрема, проведено аналіз наукової літератури з питань штучного інтелекту та його застосування в освіті, здійснено порівняльний аналіз різних підходів до інтеграції ШІ в навчальний процес, виконано синтез, узагальнення та систематизацію отриманих даних. Обгрунтовано, що ШІ може автоматизувати багато рутинних завдань викладача, таких як перевірка домашніх завдань, оцінювання тестів, ведення журналів. Це звільняє час викладача для більш творчої роботи, такої як індивідуальна робота з учнями, розробка нових методик навчання, проведення досліджень. Прояс-

нено, що використання ШІ в освіті сприяє формуванню у учнів важливих компетентностей XXI століття, таких як навички роботи з ШІ, критичне мислення, аналіз даних, креативність та інноваційність. В статті доведено, що використання ШІ в освітньому просторі є необхідним кроком для модернізації освіти та підготовки учнів до викликів сучасного світу. ШІ має значний потенціал для створення більш ефективного, персоналізованого та інклюзивного навчального середовища, що сприятиме розвитку інтелектуального та творчого потенціалу кожного учня.

Ключові слова: штучний інтелект, освіта, інновації в освіті, персоналізація навчання, ефективність.

Formulation of the problem. The modern world is rapidly changing under the influence of technological progress, and education cannot stand aside from these transformations. The integration of artificial intelligence (AI) into the educational space is one of the key directions of modernization of education, which allows adapting it to the needs of the new generation and increasing the efficiency of the learning process. AI offers a wide range of tools and opportunities for improving education, from personalizing learning to automating routine tasks. Therefore, studying the features of working with artificial intelligence by students is a priority task of education.

Analysis of recent research and publications. Many Ukrainian and foreign theoreticians, among them Celik I. [1], Chen X. [2], Devi J. S. [3], Alam A., Mohanty A. [4]. An interesting idea is that of R. Carpenter, who says that we will remain the owners of the technologies we create for a long time and they will help us solve many world problems [5].

Formulation of the goals of the article (statement of the task). This article aims to theoretically justify the necessity of using AI in the educational space. It reveals the benefits of AI for various aspects of the educational process and analyzes its potential for creating a more effective, personalized, and inclusive learning environment.

Presentation of the main research material. The convergence of artificial intelligence (AI) and emotional intelligence (EI) presents a compelling opportunity to redefine economic education. By integrating these seemingly disparate domains, educational institutions can cultivate a more holistic learning experience, equipping students with the essential skills to thrive in the 21st century. This necessitates developing new curricula that seamlessly blend technical knowledge with emotional competencies, fostering a generation of economic professionals who are not only technically proficient but also emotionally intelligent.

The imperative for integrating AI across diverse industries is widely recognized, driven by the need for innovative solutions, efficient processes, and personalized guidance at both individual and organizational levels. AI's origins can be traced back to the mid-20th century, with pioneering efforts to formalize logical reasoning processes. Notably, the early architects of AI hailed from diverse disciplines, including mathematics, economics, engineering, psychology, and political science. This interdisciplinary foundation underscores the importance of embedding AI-focused curricula and projects within these core educational programs, enabling students to explore and harness AI's transformative potential within their respective fields.

AI is undeniably revolutionizing education, presenting a wealth of opportunities to enhance learning and teaching methodologies. This technology empowers educators with sophisticated tools to optimize pedagogical practices and develop innovative, engaging, and high-quality learning materials. However, to fully leverage AI's transformative power in education, a robust theoretical understanding must be complemented by practical experience in its application.

AI can be utilized to assess the dynamics of various indicators and plan work effectively, including:

1. Identifying trends and regularities.
2. Evaluating the effectiveness of pedagogical tools.
3. Tracking student success.
4. Optimizing resources.

By strategically integrating AI into educational programs and fostering the development of both technical and emotional intelligence, we can prepare students to navigate the complexities of the 21st century and contribute meaningfully to an AI-driven world.

Artificial intelligence (AI) is rapidly transforming numerous sectors, and education is no exception. However, despite its computational prowess, AI grapples with a fundamental aspect of human interaction: emotions. This "empathy gap" presents a significant challenge for the future of AI in education.

Accordingly, the higher education sector must now respond to current issues I will ask its users

Figure 1. Fields where AI applications have the potential to revolutionize teaching and learning

in the process of gaining knowledge, transferring all the material to the virtual one a world created by AI, with the aim of developing an adaptive, inclusive, flexible, personalized and effective learning environment and deep understanding behavior, reactions, emotions of students [6].

Developing emotionally intelligent AI is a complex endeavor, requiring collaboration between educators, computer scientists, and psychologists. Yet, the potential benefits are immense. By integrating the power of AI with the nuances of human emotion, we can create learning environments that are not only effective but also genuinely supportive and empowering for every student.

This perspective emphasizes the "empathy gap" in AI and explores the ethical implications of developing and utilizing emotionally intelligent AI in education. While complete originality is challenging to guarantee, this approach aims to provide a fresh perspective on the topic.

Furthermore, while leading nations have prioritized artificial intelligence (AI) for over half a century, Ukraine faces a considerable deficit in AI readiness. To effectively bridge this gap and prepare its population for the pervasive integration of AI across all sectors, a comprehensive and accelerated approach to education reform is crucial. This necessitates a multi-pronged strategy encompassing:

1. Establishing a legal framework. Developing robust legislation is paramount to govern the ethical development and deployment of AI, safeguarding against potential misuse and ensuring responsible innovation.

2. Cultivating AI expertise. A national commitment to fostering AI talent is essential. This includes investing in advanced training programs, potentially through international collaborations, to equip individuals with the sophisticated knowledge and skills required to effectively leverage AI capabilities.

3. Promoting AI literacy. Demystifying AI for the general public is crucial. Open lectures, forums, and workshops can effectively showcase the transformative potential of AI across various domains, fostering acceptance and encouraging wider adoption.

To effectively bridge the gap in AI readiness and prepare its citizens for an AI-driven future, Ukraine must adopt a comprehensive and accelerated approach to education reform. This necessitates a multi-pronged strategy that includes establishing a robust legal framework

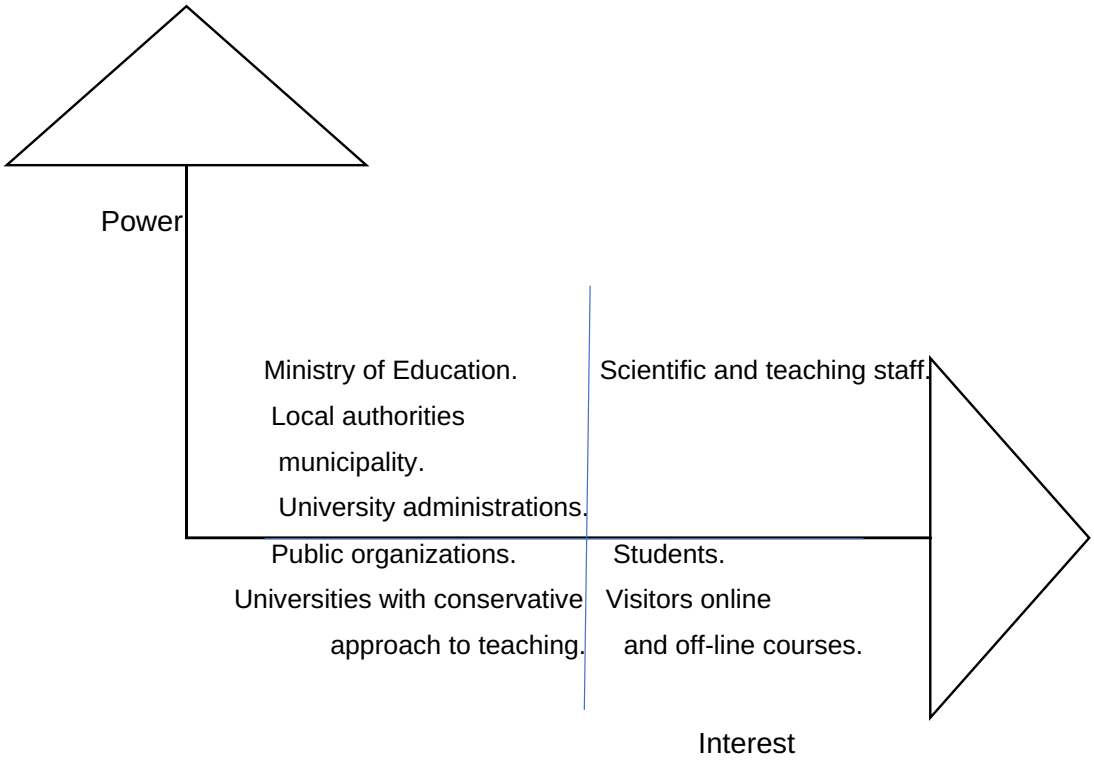

Figure 2**.** Stakeholder matrix of the project of changing approaches to the perception of artificial intelligence in the educational sphere

governing AI development and deployment, cultivating AI expertise through targeted training programs and international collaborations, and promoting AI literacy through public outreach initiatives.

A stakeholder analysis reveals that public organizations and higher education institutions with a traditional approach to education often demonstrate the least influence, power, and interest in AI integration. This highlights the need for proactive engagement and advocacy to promote the understanding and adoption of AI in education.

Therefore, artificial intelligence belongs to machine systems that can, given a set human-defined goals, make predictions, recommendations or accept decisions affecting the real or virtual environment. Systems artificial intelligence interact with us and influence our environment directly or indirectly [7].

Furthermore, a nuanced understanding of stakeholder perspectives is crucial for successful AI integration. For instance, while parents exert significant influence on their children's education, they may not fully grasp the transformative potential of AI or the importance of emotional intelligence (EQ) in this context. Targeted communication strategies are necessary to highlight the benefits of this approach and address potential concerns. Similarly, school administrators, who wield considerable influence over implementation, may prioritize logistical and budgetary concerns over pedagogical shifts. Demonstrating the positive impact of EQ-focused AI on student well-being and academic performance is key to securing their support.

Teachers, who directly interact with students, are often keen to adopt tools that enhance learning and address individual needs. Providing adequate training and support to teachers in utilizing EQ-focused AI is essential for successful implementation. Students, as the ultimate beneficiaries, have a vested interest in engaging and effective learning experiences. Their feedback on AI tools and their emotional responses should be actively sought and incorporated into the development process.

The general public, while indirectly impacted by AI's integration in education, may not be directly involved in educational changes. Raising awareness about the importance of EQ in AI education can foster wider societal support for these initiatives.

By actively engaging these stakeholders and addressing their specific needs and concerns, a collaborative ecosystem can be fostered, facilitating the successful integration

of EQ-focused AI in education and leading to more holistic and impactful learning experiences for all.

The rapid evolution of AI presents a critical challenge for educational institutions worldwide. While AI research and development have progressed significantly in leading nations, many countries face a substantial gap in AI readiness. This disparity underscores the urgent need for educational reform to equip students with the knowledge and skills necessary to thrive in an increasingly AI-driven world.

Students, as key stakeholders in education, possess a vested interest in the relevance and adaptability of their academic programs. They recognize the transformative potential of AI and its growing impact on various industries. However, their limited influence over curriculum development and the integration of AI-focused disciplines can lead to disengagement and a disconnect between academic pursuits and real-world applications.

To address this challenge, a multi-faceted approach is required, encompassing:

1. Amplifying student voices. Establishing formal channels for student feedback on curriculum design and the integration of AI-related subjects, creating student-led initiatives, and encouraging student participation in AI-related events.

2. Empowering educators. Providing comprehensive training and professional development opportunities for faculty on AI technologies and their pedagogical applications, incentivizing AI integration in teaching methodologies, and fostering collaboration between educators and AI researchers.

3. Addressing financial barriers. Seeking funding opportunities and exploring open-source AI resources to support AI-related initiatives and promote accessibility.

4. Fostering a culture of innovation. Encouraging interdisciplinary collaboration, promoting AI research and development within academic institutions, and establishing partnerships with industry leaders.

By empowering both students and educators, fostering a culture of innovation, and addressing financial barriers, educational institutions can effectively bridge the AI gap and prepare future generations for the challenges and opportunities of an AI-driven world. This necessitates a collaborative effort between students, educators, policymakers, and industry leaders to ensure that education remains relevant, engaging, and empowering in the age of AI.

To effectively bridge the AI readiness gap and empower future generations, Ukrainian educational institutions must embark on a comprehensive and accelerated journey of AI integration. This necessitates a multi-faceted approach encompassing curriculum reform, faculty development, and strategic partnerships.

1. Curriculum Reform:
– Introduce AI Fundamentals.
– Develop Specialized AI Programs.
– Foster Interdisciplinary Collaboration.
Promote Project-Based Learning.
2. Faculty Development:
– Provide AI Training.
– Encourage AI Research
– Facilitate Collaboration:
3. Strategic Partnerships:
– Collaborate with Industry.
– Engage with Government.
– Seek International Collaboration.

Conclusions. The following conclusions can be drawn from the conducted research:

1. Artificial intelligence has significant potential for transforming the educational space. It can significantly influence various aspects of the learning process, from personalization of learning to expanding access to education.

2. The use of AI in education allows for the creation of a more effective learning environment. Automation of routine tasks, adaptive learning, and other AI tools contribute to improving the efficiency and quality of education.

3. AI contributes to the personalization of learning, taking into account the individual needs and characteristics of each student. This helps to increase students' motivation and interest in learning, as well as to ensure better assimilation of knowledge.

4. AI expands access to quality education for all students, including children with special needs and students from remote regions. This contributes to the creation of a more inclusive and equitable educational environment.

5. The introduction of AI in education contributes to the development of key 21st-century competencies in students, such as critical thinking, creativity, digital literacy, and information handling skills. This helps to prepare students for the future and successful realization in the modern world.

6. It is necessary to continue research in the field of AI applications in education and to develop effective methods for its integration into the learning process. This will allow maximizing the potential of AI to improve education.

Overall, the use of AI in the educational space is a promising direction for the development of education, which can significantly improve its quality and effectiveness. The introduction of AI will help create a more personalized, inclusive, and adaptive learning environment that meets the needs of modern society and prepares students for the challenges of the future.

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