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IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE IN THE EDUCATIONAL PROCESS AT THE UNIVERSITY

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Abstract. The unprecedented pace of development and the active integration of artificial intelligence (AI) into the university environment engage educators in analyzing and discussing its possibilities, risks, and limitations in the educational process. The aim of the study is to analyze the opportunities and limitations of artificial intelligence integration into university educational processes, with particular attention to university teachers' psychological adaptation to the active use of AI in teaching practice. This study explores new opportunities for teaching, students' academic work, as well as scientific research conducted by both the teaching staff and the students.

The study employs analytical and theoretical methods (literature analysis, information synthesis, generalization, induction, deduction, identification of cause-and-effect relationships), which allow for an assessment of the current state of the education sector in the context of the widespread adoption of artificial intelligence technologies. As a part of the research, a survey was conducted among instructors of the course "Artificial Intelligence Tools: Modern Solutions in Education" to assess psychological adaptation to the active use of AI in teaching practice.

The use of artificial intelligence opens up new opportunities for optimizing the learning process, including automated assessment of students' knowledge based on predefined criteria, organization of exams and interim assessments, reduction of teachers' routine workload, as well as text translation and voice synthesis for educational purposes. The most promising area of AI implementation at universities is supplementary education, aimed at enabling students to acquire rapidly specific knowledge and skills. The application of artificial intelligence reduces the time required for literature searches, preparation of scientific reviews, task formulation, problem-solving, and communication management, significantly enhancing the efficiency of the educational process.

Keywords: artificial intelligence, digital educational technologies, university, educational process, digital literacy, learning optimization, digital competency, educational technologies

Introduction

The issues and opportunities related to digitalization and the use of artificial intelligence (AI) in education have become a relevant topic in university learning processes and are actively discussed in the academic and pedagogical community. This topic is considered as a “strategically justified aspiration of the university to integrate digital technologies into educational and general management processes.” According to Fortune Business Insights, by the end of 2022, AI capabilities, especially machine learning, were actively used in healthcare, retail, telecommunications, and banking. At the same time, some estimates suggest that the education sector is already among the leaders in AI implementation potential and the expected benefits of its adoption [1].

The acceleration of achieving educational transformation goals, including at universities, has been identified as a crucial stage in utilizing digital technologies. The current education system is still in the early stages of adopting new technologies, but due to the anticipated advantages, their integration into learning processes is inevitable. Faculty members actively discuss the opportunities, limitations, and potential consequences of AI implementation in education. It is noted that any innovation, especially changes related to large-scale modernization of standard educational systems and methods, elicits reactions from all participants in the educational process [2].

A distinctive feature of the AI field is its unprecedented pace of development, which can be challenging for an unprepared user, as new neural network architectures and algorithms are developed daily, significantly expanding AI’s capabilities. As a result, the integration of AI into education is seen as a situation that creates uncertainty, increases workload, and elevates stress levels among participants in the learning process. There is an urgent need to quickly master AI capabilities, use them effectively in teaching practice, and address issues related to academic integrity. This, in turn, may present challenges for educators. Students may also experience stress while adapting to AI, but their reaction to new technologies is often linked to misconceptions about AI as a tool for violating academic integrity principles.

Thus, AI integration represents another challenge in the era of widespread educational digitalization. Among the numerous discussions about the advantages and disadvantages of integrating innovation into the modern educational process, a much more significant issue emerges—the psychological adaptation of educators and students to new technologies, their awareness of AI’s capabilities, and their readiness to use it ethically and responsibly.

Recent international research on generative AI in higher education shows that faculty responses are heterogeneous and are shaped not only by perceived usefulness, but also by institutional support, training, ethical guidance, and confidence in using AI. Studies published in 2024–2026 report generally moderate-to-positive acceptance alongside concerns about academic integrity, reliability, skills development, and insufficient institutional preparation. These findings support examining teachers’ psychological adaptation as an important component of responsible AI integration in higher education [11, 15].

In this study, psychological adaptation refers to educators' adjustment to AI-related changes as reflected in their confidence, emotional comfort or stress, readiness for continuous learning, and willingness to use AI in professional practice. Readiness denotes the perceived capacity and intention to engage with AI, confidence refers to perceived self-efficacy in its use, and digital competence denotes the knowledge and skills required to apply digital and AI tools critically and responsibly. The term "adaptive uncertainty" is used descriptively for a transitional state in which educators already engage with AI but have not developed stable confidence or professional routines; it is not treated as a validated psychometric construct [12, 14, 15].

Additionally, it is expected that the psychological preparedness of educators and students for educational innovation will not be uniform. The difference between large cities and remote regions is linked to socio-economic conditions, such as the level of material and technical resources and access to up-to-date information on modern information technologies.

AI, as a distinct field of information technology, is capable of performing creative functions similar to those of a human, applying algorithms, developing systems for information analysis, processing large volumes of data, identifying patterns, and making predictions based on them.

The idea that AI can replicate human behavior raises certain concerns. This is due to its ability to identify patterns and learn independently through deep data analysis, leveraging accumulated experience, and selecting the most effective solutions. AI can process large amounts of information and recognize relationships within it, enabling it to predict human actions, choices, and behaviors. As a result, AI not only imitates human behavior but, in some cases, can anticipate it. These capabilities prompt reflections on the ethical and social implications of AI, as its decisions and actions may be based solely on data without considering individual human characteristics.

At present, intelligent search systems, virtual digital assistants, and chatbots are widely used. In the process of retrieving information from databases, big data technologies, contextual knowledge extraction, and intelligent data selection methods may be applied. When working with texts in mass media, audio fragment search methods can be utilized. During the stages of acquiring and analyzing new content, AI-based translation systems can assist in working with foreign-language sources, facilitating the accurate retrieval of meanings. Moreover, image-based search methods can also be employed [3].

One of the key technologies operating on the principles of neural networks (a type of AI) that has drawn the attention of researchers is the ChatGPT chatbot. It has become a valuable assistant for students in preparing academic papers. This development is associated with the increasing use of chatbots by students in generating coursework and thesis papers at universities. The particular interest in this phenomenon stems from the observed tendency of repeated occurrences of such incidents.

There is a growing body of academic research describing ChatGPT's role in generating scientific texts. Scholars highlight the potential distortions, logical

errors, and inappropriate data that may arise in text generation since humans can input mass queries without preserving the specific nuances of the material [4,5].

Similar studies were conducted on earlier versions of ChatGPT. Although its capabilities were limited at the time, certain achievements in performing text-based tasks were already evident. However, with technological advancements, the fourth version of ChatGPT, now publicly available, has been significantly improved compared to its predecessors. This version expands its ability to handle text-based tasks, enabling users to analyze more complex questions, gain a deeper understanding of content, and establish logical connections more effectively. Additionally, with enhanced algorithms and improved data models, ChatGPT-4 facilitates more natural and meaningful dialogues, better addressing user needs. These advancements have broadened the application of ChatGPT across various fields, including education, scientific research, creative writing, and other text-related domains.

Another remarkable feature is that if the generated text is nonsensical, an AI-generated revision can offer an improved, more suitable version. This raises a significant issue related to the integration of this technology into the learning process. The concern extends beyond monitoring and evaluating students' academic achievements to the trend of students relying on chatbots to produce original academic work.

A new term has emerged in the scientific literature to describe this phenomenon—GPT misconduct. Researchers define it as “a form of academic dishonesty where students submit work completed with the assistance of ChatGPT as their own” [6].

Furthermore, studies describe the broad possibilities and prospects of using AI technology in universities. For example, “an intelligent text-checking system can be utilized for independent language learning and homework completion. This system includes spell checking, semantic analysis, speech evaluation, punctuation verification, and stylistic error detection” [3].

Materials and Methods

The relevance of this study is determined by the rapid integration of artificial intelligence into the modern education system and the need to develop optimal methodologies for its effective use by participants in the pedagogical process. Today, AI technologies are widely applied across various educational aspects, from developing learning materials to assessing student performance. This transforms teaching methods and makes the learning process more flexible and efficient. The scope of AI tools in education is expanding, unlocking new opportunities for teaching and learning. However, this process requires clear methodological foundations to ensure the correct perception and effective use of AI by both students and educators. Therefore, the development of optimal approaches should not only maximize AI's potential but also ensure its appropriate and constructive application in education. Such an approach will not only enhance the quality of teaching but also make the educational process more adaptable and effective in meeting modern demands.

The aim of this study is to analyze the opportunities and limitations of AI integration into the university educational process, with particular attention to university teachers' psychological adaptation to the active use of AI in teaching practice. Clearly, AI significantly impacts pedagogical practices, learning processes, and student development. The following aspects of AI's influence on education will be explored:

1. Changing Teaching Methods

The use of AI technologies requires the introduction of new teaching methods. To master modern pedagogical techniques, educators must actively utilize interactive lectures, online courses, and educational applications. This not only enhances their digital literacy but also improves the learning process through the effective use of technology. Additionally, this approach increases the competence level of educators and prepares them to implement modern teaching methods that meet students' needs. Thus, the professional development of teachers and the improvement of their competency in using new technologies significantly contribute to enhancing the quality of education.

2. Personalization and Individualization of Learning

AI-powered digital technologies enable the development of personalized and individualized learning materials and methodologies that consider students' unique needs, learning styles, and knowledge levels. This contributes to more effective learning and comprehensive personal development.

3. Developing Digital Literacy and Information Competency

The integration of AI requires both educators and students to enhance their digital literacy and information competency. Studying these processes helps identify the necessary skills and develop curricula aimed at fostering effective interaction and critical thinking. This includes skills such as searching for information, analyzing it, ensuring online safety, and other essential digital competencies.

4. Expanding Access to Education

AI-powered information technologies increase access to educational resources and learning opportunities. Scientific studies on AI in education examine the effectiveness of various online learning models, virtual classrooms, and distance learning methods. These technologies help expand educational opportunities for different social groups, including students with disabilities and those living in remote areas, ensuring broader access to education.

5. Impact on Student Development and Learning Outcomes

Recent studies extensively explore the impact of AI on student learning outcomes and personal development. These studies assess AI's role in improving academic performance, its influence on students' motivation levels, and its significance in developing problem-solving skills. Additionally, AI's effectiveness in fostering critical thinking, enhancing creativity, and supporting cognitive development is analyzed. Beyond that, researchers evaluate AI's ability to personalize educational content, adapt learning materials, and optimize the learning process to meet individual student needs. As a result, the primary

focus of research is on enhancing education quality and supporting students' comprehensive development through AI integration.

Analytical and theoretical research methods (literature analysis, generalization, data synthesis, identification of cause-and-effect relationships, induction, and deduction) were used to assess the current state of AI implementation in education. Additionally, within the framework of pedagogical practice, an express survey was conducted among educators during the course "Artificial Intelligence Tools: Modern Solutions in Education" to examine their psychological adaptation to the active use of AI in teaching.

The empirical component was exploratory and descriptive. The sample comprised 80 instructors who participated in the course "Artificial Intelligence Tools: Modern Solutions in Education" and completed the express survey; it should therefore be regarded as a course-based sample rather than a representative sample of university teachers. The present analysis does not stratify respondents by age, gender, discipline, or teaching experience. The 14-item questionnaire covered frequency and types of AI use, self-reported confidence and competence, emotional reactions and stress, readiness for continuous learning, perceived professional impact, institutional and collegial support, training needs, and time available for learning AI. Given the express-survey format, the questionnaire is used as a descriptive instrument rather than a standardized psychometric scale, and no claim of psychometric validation is made. Responses were summarized using frequencies and percentages and interpreted descriptively; accordingly, the empirical findings are treated as context-specific.

The analysis of the impact of AI-driven digitalization in education helps identify the advantages and disadvantages of using technologies in education, as well as determine the best pedagogical practices and strategies for the effective integration of digital technologies into the learning process.

Results

With the emergence of artificial intelligence, educators are presented with new opportunities in three key areas of professional activity: students' academic work, teachers' pedagogical activities, and research conducted by both teachers and students.

The application of AI in pedagogical activities is primarily associated with optimizing the teaching process. Scholars highlight the following key functions of AI: "assessment of students' knowledge based on predefined criteria, organization and administration of tests and exams, provision of feedback, monitoring students' progress in mastering educational material, analyzing student engagement in the learning process, and generating content for lectures and lessons. Overall, researchers believe that AI can help teachers eliminate repetitive daily tasks, allowing them to devote more time to developing and enhancing the quality of

educational content” [7]. The integration of artificial intelligence into students’ academic activities is described by scholars as a tool that facilitates learning. AI can help identify common mistakes and problematic areas, as well as suggest literature to help students grasp complex topics. Additionally, this technology can take into account each student’s interests and recommend supplementary courses and reading materials for a deeper understanding of the subject. “AI can translate texts from various languages and restructure sentences to make them simpler and easier to understand. The text-to-speech function can be particularly beneficial for students with special needs. However, one of the main tasks in mastering professional knowledge is the development of a conceptual framework and the ability to analyze materials in professional language. Working with complex materials enables students to develop cognitive skills such as analysis, comparison, generalization, and specification. This is particularly important in the early stages of university education. Any incorrect conclusion is the result of a thought process. In education, the emphasis should be not only on the final result but also on the process: how the student arrived at the conclusion and at what stage of reasoning an error occurred. This is the process of teaching thinking, learning how to apply one’s cognitive abilities to solving academic tasks and later professional challenges. From this perspective, the use of AI in working with academic texts may pose a risk of limiting students’ cognitive development” [4].

In addition to the aforementioned functions that enable students to carry out their academic activities, some researchers consider AI as a tool for students’ personal development, particularly in fostering their ability to choose unique approaches and enhance creativity. Specifically, they argue that AI can influence students’ decision-making regarding innovative solutions and contribute to the development of their creative abilities. For example, the limitations of ChatGPT require students to critically analyze the generated text, verify facts, check references, and assess the reliability of the obtained information [8].

Developing students’ critical thinking through AI technologies is an intriguing yet controversial issue. If AI is viewed as a tool for solving pedagogical tasks, a fundamental question arises: what specific educational objective should it serve? Should it primarily be used to detect errors and inconsistencies in generated texts? Or should it focus on fostering critical thinking by encouraging students to engage with well-substantiated and reliable information? In this case, criticism should not be limited to identifying mistakes in an argument but should instead be directed toward a deeper understanding of authors’ perspectives, leading to well-reasoned conclusions. This approach allows students to reflect on whether they agree or disagree with an author’s standpoint and to develop their own well-founded opinions. Thus, constructive analysis of information and objective evaluation enable a more comprehensive understanding of content and a more effective reasoning process.

Therefore, while AI's functionalities can contribute to optimizing the educational process, they may also introduce certain risks in achieving pedagogical objectives.

In scientific literature, the potential of AI in the research activities of both teachers and students has been widely explored and analyzed. In particular, AI technologies such as ChatGPT are recommended for use during the initial stages of research—for quickly retrieving information, formulating preliminary ideas, and developing hypotheses. Additionally, AI can provide significant assistance in systematizing, summarizing, and analyzing various types of scientific data. Beyond this, AI is highly valued for describing research methodologies, editing scientific texts, and structuring research materials. However, AI's potential is not limited to these functions—future advancements are expected to further expand its role and application in enhancing the efficiency of scientific research. All these factors open up new possibilities for integrating AI into research activities and optimizing the research process. AI tools can simplify the preparation of scientific papers and streamline workflows. However, there are risks associated with potentially limiting students' academic development. AI can successfully perform each of these operations, saving students time and allowing them to engage in deeper research. However, excessive reliance on AI may negatively impact students, particularly in the early stages of their education. Students have long used calculators, statistical data processing software, and translation tools in their learning process. However, multiplication tables are still taught in schools, and subjects like higher mathematics and foreign languages remain an essential part of university curricula. Similarly, AI should be regarded as a tool for achieving educational goals rather than as a substitute for essential cognitive skills. If the primary goal of teachers' research work is to achieve scientific results, the main objective for students should be the development of cognitive abilities and the formation of individual intellectual structures. This will enable them to effectively utilize these tools for professional purposes in the future.

Researchers also define the boundaries of artificial intelligence application in higher education. For example, a chatbot can generate texts containing various ideas, but it cannot determine the novelty, originality, or significance of these ideas. "AI-based language bots do not possess a creative perspective and cannot generate know-how". AI is also not a reliable tool for making accurate citations in academic literature. Additionally, there is a risk of obtaining false content, as chatbots cannot critically filter relevant and verified information from large datasets [9].

Based on the areas under consideration, a survey on psychological adaptation to active AI usage was conducted among the participants of the course "Artificial Intelligence Tools: Modern Solutions in Education" at M. Utemisov West Kazakhstan University. A total of 80 instructors took part in the survey.

1. How often do you use AI in your teaching activities?
☐ regularly ☐ occasionally ☐ rarely ☐ never
2. Which AI tools do you use?
 (e.g., ChatGPT, neural networks for presentations, assessment tools, etc.)
3. How would you assess your level of confidence when working with AI?
☐ high ☐ moderate ☐ low
4. What emotions does the implementation of AI in the educational process evoke in you?
☐ interest ☐ calmness ☐ anxiety ☐ fear
5. Do you experience tension or stress while mastering AI technologies?
☐ no ☐ sometimes ☐ often
6. How comfortable are you with the need for continuous learning of new technologies?
☐ comfortable ☐ neutral ☐ uncomfortable
7. How easily do you adapt to new digital tools?
☐ easily ☐ moderately difficult ☐ very difficult
8. Do you consider yourself sufficiently competent to apply AI in the teaching process?
☐ yes ☐ partially ☐ no
9. Does working with AI affect your professional self-confidence?
☐ increases ☐ does not affect ☐ decreases
10. Do you have concerns that AI may reduce the perceived value of the teaching profession?
☐ no ☐ sometimes ☐ often
11. Are you interested in further training in the use of AI?
☐ yes ☐ rather yes ☐ rather no ☐ no
12. What support resources do you need?
☐ methodological materials
☐ practical training sessions
☐ expert consultations
☐ mentoring from colleagues
13. Do you feel support from the administration or colleagues in mastering AI?
☐ yes ☐ partially ☐ no
14. Is the time allocated in your work schedule sufficient for learning how to use AI?
☐ sufficient ☐ insufficient

The obtained results indicate a fairly high level of psychological adaptation of university teachers to the use of artificial intelligence technologies in their professional activity. The majority of respondents systematically employ AI tools

in the educational process, confirming the active integration of digital technologies into everyday teaching practice. At the same time, a group of teachers continues to use AI rarely or not at all, indicating the presence of individual barriers—both technological and psychological, associated with a lack of experience or insufficient self-confidence.

The pie chart demonstrates that **72.5%** of teachers use AI regularly or occasionally, reflecting a high degree of technological integration within the educational process. **22.5%** of respondents use AI rarely, and only **5%** do not use it at all, indicating the presence of a relatively small group of educators who require additional support and training (Figure 1).

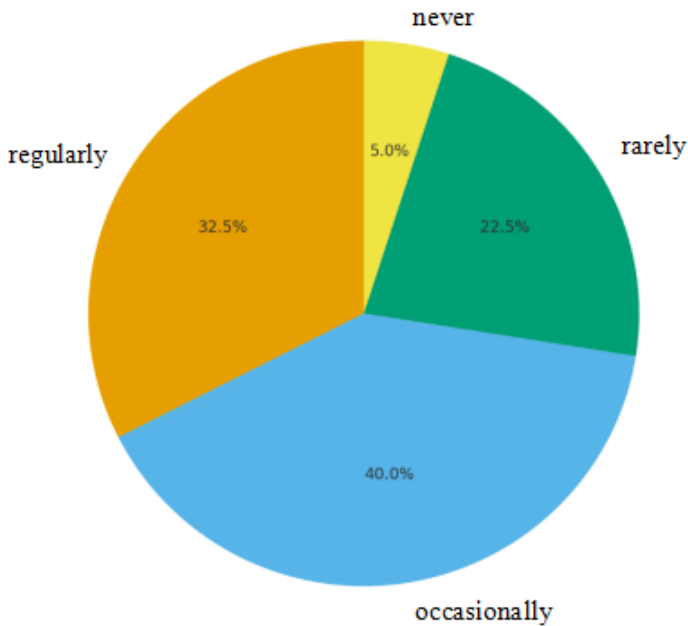


Figure 1 - Frequency of AI Use

An analysis of self-assessed competence and confidence in working with AI revealed the predominance of a **moderate level of confidence**, as shown in Figure 2. This distribution reflects the phenomenon of “*adaptive uncertainty*” characteristic of the digital transformation stage: teachers are already involved in working with new tools but have not yet developed a stable sense of professional mastery. The presence of a relatively large share of respondents with a **high confidence level** indicates the potential formation of a core group of experts and mentors capable of supporting the development of digital practices within academic communities (Figure 2).

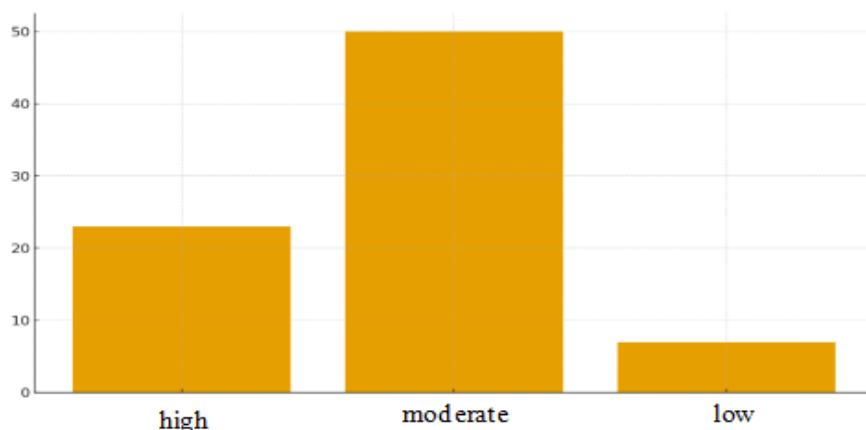


Figure 2 - Level of Confidence in Working with AI

Particularly significant are the findings related to the emotional background associated with AI implementation. The predominance of calmness and the extremely low levels of anxiety and fear reflect a favorable psychological climate. The minimal stress experienced by most participants indicates that the introduction of AI is not perceived as a threat or a destabilizing factor for professional identity. Instead, AI technologies are primarily seen as a neutral or resource-enhancing component of the educational environment.

The diagram demonstrates a positive situation: approximately **84%** of teachers report no stress, while the remaining respondents indicate only occasional tension. The proportion of educators who frequently experience stress is minimal (**2.5%**), suggesting good overall adaptability to innovation implementation (Figure 3).

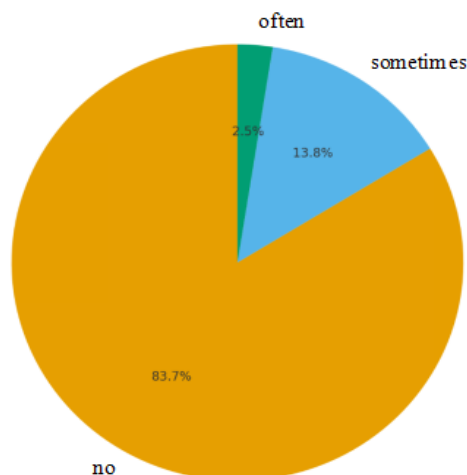


Figure 3 - Stress Associated with Learning AI

Indicators of readiness for further training confirm a high level of intrinsic motivation toward professional development: almost all respondents expressed interest in continuing to master AI tools. This highlights a strong demand for systematic professional development and methodological support, as well as a commitment to lifelong learning as an integral part of contemporary teaching culture (Figure 4).

At the same time, indicators reflecting partial administrative support and insufficient time allocated for training reveal structural constraints in the adaptation process. Despite high levels of personal motivation, the lack of adequate institutional conditions may slow the formation of stable digital competencies. Therefore, adaptation to AI requires not only individual efforts by teachers but also comprehensive institutional measures - including mentoring programs, practice-oriented training sessions, and the allocation of dedicated time resources within work schedules.

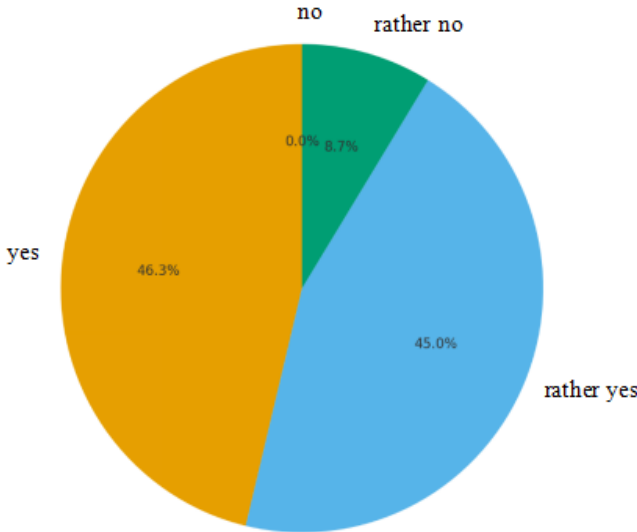


Figure 4- Interest in AI Training

Within the surveyed group, the results indicate a moderately favorable and dynamically developing pattern of adaptation to AI. Reported psychological barriers were generally limited, and motivation was high; however, there is an ongoing need to strengthen professional confidence and expand support systems. This underlines the importance of transitioning from fragmented approaches to AI adoption toward a holistic institutional strategy for supporting the digital transformation of higher education.

To minimize negative phenomena that hinder adaptation, it is necessary to establish a set of measures that will help educators overcome emerging difficulties as quickly as possible. Among the main stress factors highlighted by teachers were a lack of information on AI-related topics and insufficient time to study it.

One possible solution to this issue is the development of concise methodological guides that are written in an accessible language for a broad audience, without excessive technical terminology. However, educators can already facilitate their adaptation process by using freely available methodological resources published on online educational platforms. These guides explain the principles of how ChatGPT's neural network operates, methods for formulating effective queries, time-saving strategies, and provide links to useful AI resources.

Nevertheless, such guidelines still require further refinement, as they may sometimes offer incorrect recommendations and mislead educators. Mastering AI tools should not be viewed as an additional burden on teachers but rather as an effective opportunity to delegate certain tasks to a virtual assistant.

It is crucial to continue actively promoting awareness about AI and its integration into various fields of human activity at all levels. Observing successful examples of AI implementation across different institutions can help reduce educators' general concerns regarding the potential negative consequences of AI use in education.

Discussion

Recommendations for continuing education learners should be aimed at encouraging them to perceive AI as a tool to support their cognitive activities, rather than as a means for mindless copying. It is important to maintain requirements that ChatGPT must be included in the list of literature sources when completing homework assignments and creative projects.

Educators can demonstrate openness to new technologies by developing assignments that specifically require the use of neural networks. For those concerned about the unfair use of AI by students, it may be beneficial to require not only the final version of an assignment but also drafts, notes, and reflections on the thought process as part of the submission.

The reviewed literature also indicates that students may rely on generative AI when seeking rapid assistance with academic tasks, which reinforces the need for clear guidance on source use and academic integrity [13]. To address this issue, instructors can introduce specialized assignments requiring students to prepare reports and presentations based on specific, credible sources. This approach helps students move away from relying on a single information source and teaches them to use scientifically grounded materials. In this regard, instructors must provide students with recommended books and study materials. This not only improves students' access to essential literature but also enhances their skills in working with academic sources. As a result, students will develop their ability to critically analyze information and conduct comprehensive research.

The described measures aim to clarify that educational use of AI should be governed by transparent rules rather than treated automatically as academic

dishonesty; acceptable use depends on the purpose of the task, disclosure requirements, and institutional policy [13]. However, AI must be used with great care and responsibility; otherwise, improper use could be detrimental to users themselves.

In summarizing this part of the analysis, it is evident that AI usage offers many advantages (e.g., in banking, medicine, logistics, and telecommunications) while also presenting significant risks (e.g., in the university learning process, where concerns arise not only due to AI's current limitations but also within the broader challenges described earlier).

At present, the goal of university education is not solely limited to students achieving academic success. It also encompasses their development as individuals, adaptation to society, and the formation of their worldview. The integration of artificial intelligence into the educational process plays a crucial role in achieving these objectives. AI enables students to quickly process vast amounts of information and effectively structure learning materials. However, this approach also has its downsides: it may impose limitations on the development of essential cognitive processes required for understanding, assimilating, and generating new knowledge. In other words, optimizing the learning process through AI may encourage students to rely on pre-existing information rather than fostering critical thinking, analytical reasoning, and creativity. Therefore, maintaining a balance in AI integration within the education system is essential—it should simplify information processing while not restricting students' intellectual and personal growth. This issue is particularly relevant in higher education. The advantages of AI in student learning, as described above, may inadvertently hinder the development of systematic thinking and independent decision-making skills.

In the early stages of the university learning process, special attention is given to the personal development of students. New technologies used as educational tools can spark students' interest while also potentially causing stress and increasing motivation to complete assignments. However, it is more important to foster a research-driven curiosity not just about learning tools but also about the content of education and the chosen field of study. This issue, of course, requires separate and in-depth discussion. Nevertheless, “in this context, digitalization is considered a factor that defines teaching methods and tools, the role of educators within the education system, and mechanisms for optimizing the learning process” [10].

So far, no universal or standardized approaches have been developed for integrating artificial intelligence into various institutions of human life. As a result, while AI's full potential in digital education is being explored, no effective mechanisms have yet been identified to minimize its negative psychological impact on individuals. Therefore, a comprehensive study of how stakeholders in

modern higher education institutions perceive and respond to AI integration in the educational process is necessary.

Based on the theoretical analysis and the express survey of 80 instructors at one university, we came to the the following conclusions within the scope of this exploratory study:

- Within the surveyed instructor group, AI was already widely used, and the findings indicate generally positive engagement with its integration into the educational process. The broader theoretical analysis nevertheless suggests that attitudes toward AI remain mixed and depend on perceived benefits, risks, and institutional conditions.

- Among the surveyed instructors, professional workload and limited access to concise, relevant information about AI were identified as factors that may hinder adaptation.

- The findings do not support a general conclusion that educators are resistant to innovation; rather, the presence of a smaller group with limited or no AI use suggests that individual technological and psychological barriers remain.

- Within the theoretical analysis, continuing education appears to be a promising area for AI application because learners in this context typically possess established professional and academic skills.

Conclusion

By reducing the time spent on literature searches, conducting scientific reviews, setting specific tasks, and organizing interactions with students, we can see that optimizing education through artificial intelligence is possible. Therefore, continuing education can be considered a relevant area for researching and applying AI technologies. Retraining and professional development programs typically involve learners who have already received professional education and mastered the fundamental skills of working with academic and scientific materials.

In this context, optimizing education is highly effective, as it allows students to focus on key aspects of their field, the latest scientific advancements, and the analysis of research results within the framework of professional practice. This approach enables learners to gain a deeper understanding of educational material and apply their acquired knowledge in practice. Furthermore, the targeted integration of AI technologies into continuing education can facilitate the rapid acquisition of large volumes of information, the effective application of learned material in real-life situations, and the development of essential professional skills. Thus, the thoughtful incorporation of AI into the learning process enhances students' educational experiences and expands their professional and personal development opportunities. Currently, the continuing education system presents the most promising area for studying the impact of AI technologies on teaching

and professional competence acquisition. We frequently emphasize that education should be aimed at finding individualized teaching and learning methods that enable each student to achieve the highest possible results. In this regard, exploring personalized learning trajectories, we consider them the foundation of an individual's educational pathway. Their transformation occurs at the intersection of multiple processes, including the formation and development of value systems, and contributes to self-realization and self-identification. Artificial intelligence expands educational opportunities and helps students develop their own individual learning trajectories. However, the potential risks associated with AI must be considered and minimized. Based on the currently available data, it is possible to begin developing educational strategies that incorporate AI. This process should include problem-solving, risk mitigation, and creating conditions that ensure the smooth adaptation of both teachers and students as AI is integrated into universities.

The empirical findings should be interpreted in light of the exploratory design and the course-based sample of 80 instructors from one university. Further multi-institutional studies using validated measures and more detailed respondent characteristics are needed to test the broader applicability of the observed patterns.

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УНИВЕРСИТЕТТІҢ БІЛІМ БЕРУ ҮДЕРІСІНЕ ЖАСАНДЫ ИНТЕЛЛЕКТІНІ ЕНДІРУ

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Аңдатпа. Бұрын-соңды болмаған даму қарқыны мен жасанды интеллектіні университеттік ортаға белсенді енгізу оқытушыларды білім беру процесінде оның қолданылуының мүмкіндіктері, тәуекелдері мен шектері туралы талдау жасауға және талқылауға тартады. Зерттеудің мақсаты – университеттің білім беру процестеріне жасанды интеллектіні интеграциялауды сандық технологияларды қолданудың стратегиялық тәсілі ретінде зерттеу, бұл білім беруді трансформациялау мақсаттарына қол жеткізуді жылдамдатады. Бұл қызметте оқытуды, студенттердің оқу жұмысын, сондай-ақ оқытушылар мен студенттер жүргізетін ғылыми зерттеулерді жүзеге асырудың жаңа мүмкіндіктері анықталады.

Зерттеуде аналитикалық-теориялық әдістер қолданылды (әдебиеттерді талдау, ақпаратты синтездеу, жинақтау, индукция, дедукция, себеп-салдар байланыстарын анықтау), бұл жасанды интеллект технологияларының кеңінен таралуы жағдайында білім беру саласының ағымдағы жағдайын бағалауға мүмкіндік береді. Жұмыс барысында «Жасанды интеллект құралдары: білім беру саласындағы заманауи шешімдер» курсының оқытушылары арасында жасанды интеллектіні педагогикалық тәжірибеде белсенді қолдануға психологиялық бейімделуге байланысты сұрау жүргізілді.

Жасанды интеллектіні қолдану оқу процесін оңтайландырудың жаңа мүмкіндіктерін ашады, соның ішінде студенттердің білімін белгіленген критерийлер бойынша автоматтандырылған бағалау, емтихандар мен аралық бақылауды ұйымдастыру, оқытушылардың рутиналық жүктемесін азайту, сондай-ақ мәтіндерді аудару және дыбыстап оқыту. Университетте жасанды интеллектіні енгізудің ең болашақ саласы студенттердің нақты

білім мен дағдыларды тез меңгеруіне бағытталған қосымша білім беру болып табылады. Жасанды интеллектіні қолдану әдебиетті іздеуге, ғылыми шолуларды дайындауға, тапсырмаларды қоюға, мәселелерді шешуге және коммуникация ұйымдастыруға кететін уақытты қысқартады, бұл білім беру процесінің тиімділігін едәуір арттырады.

Тірек сөздер: жасанды интеллект, цифрлық білім беру технологиялары, университет, білім беру үдерісі, цифрлық сауаттылық, оқытуды оңтайландыру, цифрлық құзыреттілік, оқыту технологиялары

ВНЕДРЕНИЕ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В ОБРАЗОВАТЕЛЬНОМ ПРОЦЕССЕ УНИВЕРСИТЕТА

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Аннотация. Быстрое развитие и активное внедрение искусственного интеллекта в университетскую среду побуждают преподавателей анализировать и обсуждать его возможности, риски и ограничения в образовательном процессе. Цель данного исследования — изучить интеграцию ИИ в образовательные процессы вуза как стратегический способ использования цифровых технологий для ускорения трансформации образования. При этом раскрываются новые перспективы для преподавания, обучения студентов и проведения научных исследований как преподавателями, так и обучающимися.

В исследовании использовались аналитико-теоретические методы (анализ литературы, синтез информации, обобщение, индукция, дедукция, выявление причинно-следственных связей), позволяющие оценить текущее состояние системы образования в условиях активного распространения ИИ-технологий. Также был проведен экспресс-опрос среди преподавателей курса «Инструменты искусственного интеллекта: современные решения в сфере образования», в рамках которого изучались вопросы психологической адаптации к активному применению ИИ в педагогической деятельности.

Использование ИИ открывает новые возможности для оптимизации учебного процесса, включая автоматизированную оценку знаний студентов по заданным критериям, организацию экзаменов и зачетов, снижение рутинной нагрузки преподавателей, а также автоматический перевод и озвучивание текстов. Особый потенциал ИИ видится в сфере дополнительного образования, ориентированного на быстрое освоение

студентами необходимых знаний и навыков. Внедрение ИИ позволяет сократить время на поиск литературы, подготовку научных обзоров, постановку задач, решение проблем и организацию коммуникации, что в итоге существенно повышает эффективность образовательного процесса.

Ключевые слова: искусственный интеллект, цифровые образовательные технологии, университет, образовательный процесс, цифровая грамотность, оптимизация обучения, цифровая компетенция, образовательные технологии

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