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Ergabylova A.[1]* *Turebayeva Sh.*[1]

[1]*L.N.Gumilyov Eurasian National University, Astana, Kazakhstan*

ARTIFICIAL INTELLIGENCE IN ADAPTIVE LEARNING: EFFECTIVENESS AND PROSPECTS

Abstract

Modern artificial intelligence (AI) technologies are actively being integrated into the educational sector, facilitating the advancement of adaptive learning. AI-based adaptive educational systems enable personalization of the learning process by taking into account students' individual characteristics, their prior knowledge levels, and preferred learning styles. However, the question regarding the effectiveness of these technologies remains unresolved and necessitates further investigation.

The purpose of this research is to evaluate the effectiveness of AI technologies in implementing adaptive learning, identifying their advantages as well as potential limitations. To achieve this goal, theoretical analysis of scientific literature, comparative analysis of traditional and AI-based learning methods, as well as empirical approaches, including surveys of students and educators, analysis of educational data, and experimental studies employing intelligent educational platforms, were utilized.

The research findings indicate that AI-based adaptive systems enhance student motivation, improve material comprehension, and facilitate a personalized approach to learning. At the same time, certain limitations were identified, including ethical concerns, the need for ongoing technical support, and dependency on the quality of input data.

The key findings of the study confirm that AI technologies possess significant potential within the educational process; however, their effective implementation requires a comprehensive approach that encompasses methodological, technical, and pedagogical support.

Keywords: artificial intelligence, adaptive learning, educational technologies, personalization of learning, AI effectiveness.

А.А.Ергабылова, [1]* *Ш.М.Туребаева* [1]

[1] *Л.Н.Гумилёв атындағы Еуразия ұлттық университет, Астана қ., Қазақстан*

БЕЙІМДЕЛГЕН БІЛІМ БЕРУДЕГІ ЖАСАНДЫ ИНТЕЛЛЕКТ: ТИІМДІЛІГІ МЕН БОЛАШАҒЫ

Аңдатпа

Қазіргі заманғы жасанды интеллект (AI) технологиялары бейімделген оқытуды жақсартуға ықпал ететін білім беру секторына белсенді түрде енгізілуде. AI негізіндегі бейімделген білім беру жүйелері оқушылардың жеке ерекшеліктерін, олардың алдыңғы білім деңгейлерін және қалаған оқу мәнерлерін ескере отырып, оқу процесін даралауға мүмкіндік береді. Дегенмен, бұл технологиялардың тиімділігіне қатысты мәселе әлі де шешілмеген және қосымша зерттеуді қажет етеді.

Бұл зерттеудің мақсаты бейімделген оқытуды енгізудегі AI технологияларының тиімділігін бағалау, олардың артықшылықтары мен ықтимал шектеулерін анықтау болып табылады. Осы мақсатқа жету үшін ғылыми әдебиеттерді теориялық талдау, дәстүрлі және AI негізіндегі оқыту әдістерін салыстырмалы талдау, сондай-ақ эмпирикалық тәсілдер, соның ішінде студенттер мен мұғалімдерден сауалнамалар, білім беру деректерін талдау және интеллектуалды білім беру платформаларын пайдаланатын эксперименттік зерттеулер пайдаланылды.

Зерттеу нәтижелері AI негізіндегі бейімделу жүйелерінің оқушылардың мотивациясын арттыратынын, материалды түсінуді жақсартатынын және оқуға жеке көзқарасты жеңілдететінін көрсетеді. Сонымен бірге белгілі бір шектеулер анықталды, оның ішінде этикалық мәселелер, тұрақты техникалық қолдау қажеттілігі және кіріс деректерінің сапасына тәуелділік.

Зерттеудің негізгі нәтижелері AI технологияларының білім беру үдерісінде маңызды әлеуетке ие екенін растайды; дегенмен, оларды тиімді жүзеге асыру әдістемелік, техникалық және педагогикалық қамтамасыз етуді қамтитын кешенді тәсілді қажет етеді.

Түйін сөздер: жасанды интеллект, бейімді оқыту, білім беру технологиялары, оқытуды жекелендіру, AI тиімділігі.

Ергабылова А.А.,[1]* *Туребаева Ш.М.*[1]
[1]*Евразийский национальный университет имени Л.Н.Гумилёва, г.Астана, Казахстан*

ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ В АДАПТИВНОМ ОБУЧЕНИИ: ЭФФЕКТИВНОСТЬ И ПЕРСПЕКТИВЫ

Abstract

Современные технологии искусственного интеллекта (ИИ) активно интегрируются в сферу образования, способствуя развитию адаптивного обучения. Адаптивные образовательные системы на основе ИИ позволяют персонализировать процесс обучения, учитывая индивидуальные особенности учащихся, их предшествующий уровень знаний и предпочитаемые стили обучения. Однако вопрос об эффективности этих технологий остается открытым и требует дальнейшего изучения.

Цель данного исследования – оценить эффективность технологий ИИ при реализации адаптивного обучения, выявить их преимущества и потенциальные ограничения. Для достижения этой цели были использованы теоретический анализ научной литературы, сравнительный анализ традиционных и основанных на ИИ методов обучения, а также эмпирические подходы, включая опросы учащихся и преподавателей, анализ образовательных данных и экспериментальные исследования с использованием интеллектуальных образовательных платформ.

Результаты исследования свидетельствуют о том, что адаптивные системы на основе ИИ повышают мотивацию учащихся, улучшают усвоение материала и способствуют персонализированному подходу к обучению. В то же время были выявлены определенные ограничения, включая этические вопросы, необходимость постоянной технической поддержки и зависимость от качества входных данных. Основные результаты исследования подтверждают, что технологии искусственного интеллекта обладают значительным потенциалом в образовательном процессе, однако для их эффективного внедрения необходим комплексный подход, включающий методическую, техническую и педагогическую поддержку.

Ключевые слова: искусственный интеллект, адаптивное обучение, образовательные технологии, персонализация обучения, эффективность искусственного интеллекта.

Introduction. AI-driven adaptive learning facilitates the personalization of the educational process by dynamically adjusting the complexity of instructional materials and the pace of learning to align with students' individual needs and learning profiles. This approach contributes to increased student motivation, improved knowledge retention, and more efficient utilization of educational resources. The integration of AI into educational processes enhances the flexibility of learning by dynamically modifying the content and format of instruction in response to learners' individual needs.

The key factors for the effectiveness of AI-based learning are the quality of input data, the accuracy of personalization algorithms, the level of digital literacy among teachers and students, and the integration of AI with existing educational platforms. However, artificial intelligence technologies in education raise concerns about data privacy, digital security, and potential algorithmic bias in shaping learning pathways.

Basic provisions. Modern education in Kazakhstan is undergoing a period of rapid transformation driven by digitalization, globalization, and the reform of the educational system. One of the key challenges is the need for a personalized approach to learning, as traditional methods often fail to account for students' individual characteristics, their level of preparedness, cognitive styles, and learning pace. In this context, there is a growing need for technologies that enable the adaptation of the learning process to the individual needs of each student.

In Kazakhstan, initiatives aimed at the digitalization of education are actively being implemented, including through government programs and projects focused on integrating artificial intelligence technologies into the educational process. The Ministry of Science and Higher Education of the Republic of Kazakhstan supports the development and implementation of digital solutions, including adaptive educational platforms that take into account the individual needs of learners. However, despite these initiatives, there remains a need for systematic analysis of the effectiveness of these technologies, their impact on academic performance, and the development of students' competencies.

In this study, we also consider it appropriate to highlight the successful application of adaptive AI systems in Kazakhstan. In Kazakhstan, adaptive learning systems based on artificial intelligence are being actively implemented and have already proven their effectiveness in practice. Among the most well-known and widely used educational platforms are Platonus, BilimLand, Kundelik.kz, and Daryn Online.

The Platonus system was one of the first digital platforms to be implemented in educational institutions in Kazakhstan. Platonus offers comprehensive solutions for the automation of the educational process and actively integrates elements of artificial intelligence to personalize students' learning experiences. Utilizing AI algorithms, Platonus performs adaptive monitoring of student performance by automatically generating individualized learning tasks, which adjust in difficulty based on students' current achievements and identified knowledge gaps. The system analyzes academic progress in real time, enabling instructors to promptly receive insights into students' learning challenges. This enhances the overall efficiency of the educational process by saving instructors' time and increasing student motivation, as the assigned tasks align with their current knowledge and skill levels.

BilimLand is one of the largest and most successful Kazakhstani projects in the field of online education. The platform offers thousands of interactive lessons and multimedia materials covering the entire school curriculum. A key feature of BilimLand is the use of artificial intelligence to construct individualized learning pathways for students. The platform automatically adapts content to each student's knowledge level by analyzing the results of completed assignments and tests. This allows learners to progress at an optimal pace and focus on areas that require additional attention. Leveraging AI, the platform also provides personalized recommendations for studying topics where the greatest difficulties have been identified, helping students to efficiently and effectively address gaps in their knowledge.

Kundelik.kz is an electronic platform that has become an integral part of the daily educational environment in Kazakhstani schools. The system automates documentation processes and facilitates communication among teachers, students, and parents, while also incorporating adaptive learning capabilities. Artificial intelligence in Kundelik.kz is used to analyze student performance and provide recommendations to teachers and parents for improving academic outcomes. For instance, the system can identify subjects and topics where a student is experiencing the greatest difficulties and automatically suggest additional assignments and resources to address these challenges. This significantly simplifies teachers' workload, allowing them to dedicate more time to individualized interaction with students.

The Daryn Online educational platform, which focuses on preparing students for final examinations and academic competitions, deserves particular attention. This platform effectively leverages artificial intelligence technologies to create individualized learning programs tailored to each student's needs. The system analyzes students' responses in real time, identifies errors, and automatically generates additional exercises to reinforce understanding and facilitate deeper mastery of complex material. Daryn Online also offers automated proctoring and learning process monitoring features, enhancing the efficiency of exam preparation and ensuring the objectivity of knowledge assessment.

Thus, the platforms described above demonstrate the high practical effectiveness of applying adaptive AI systems in Kazakhstan. They not only enhance the quality of the educational process but also make it more personalized and interactive. However, for the successful scaling of such technologies, it is essential to ensure continuous support for the technical infrastructure and to improve the digital literacy of both teachers and students.

These factors will serve as key foundations for the sustainable development of adaptive education in Kazakhstan. In recent years, artificial intelligence (AI) technologies have been increasingly applied in the field of education, offering new opportunities for adaptive learning. AI-based adaptive educational systems are capable of analyzing student data in real time, providing personalized learning materials, and adjusting the difficulty of tasks based on the learner's performance [1, p. 28]. However, despite

significant progress in the development of such systems, questions remain regarding their effectiveness, pedagogical applicability, and impact on educational outcomes.

The relevance of this study is determined by the need to assess the actual effectiveness of adaptive learning supported by artificial intelligence. While contemporary research has begun to explore the advantages of such systems, there is still a lack of empirical data to evaluate their impact across various educational contexts. Moreover, a comprehensive analysis of the ethical, pedagogical, and technological aspects of AI integration into the educational process is required.

The aim of this research is to determine the effectiveness of AI technologies in adaptive learning, to identify key factors influencing their success, and to analyze potential risks and limitations.

The significance of the study lies in its potential contribution to the development of pedagogical approaches and technologies aimed at personalized learning. The findings may be valuable for educational platform developers, educators, academic administrators, and researchers in the field of digital education. The implementation of AI-powered adaptive educational systems may enhance student motivation, improve academic performance, and foster the creation of a more inclusive learning environment that meets the demands of modern education.

Materials and Methods. The aim of this study is to identify the pedagogical conditions necessary for the formation and development of innovative thinking among university students. The implementation of innovative educational technologies requires an analysis of the factors influencing the development of students' critical and creative thinking, as well as an assessment of the effectiveness of various teaching methods.

To achieve this goal, methods of theoretical analysis of scientific literature were employed, along with empirical data processing, which included student surveys.

The primary research method was a questionnaire survey, using a specially designed instrument titled *"Innovative Thinking in Professional Activity"*, developed by the authors. The questionnaire included items aimed at assessing students' awareness of the concept of innovative thinking, their understanding of its significance, key components, and strategies for its development.

The survey contained both closed-ended questions with multiple-choice options and open-ended questions that allowed respondents to elaborate on their thoughts. A total of 55 third- and fourth-year students from various academic disciplines participated in the study.

Data Processing. Based on the collected data, mathematical processing was conducted, including quantitative analysis to identify key trends and qualitative analysis to interpret students' opinions.

Results and Discussion. The survey data indicate that adaptive technologies based on artificial intelligence have a significant impact on the educational process. The majority of students (approximately 80%) reported that the use of AI systems enhances their understanding of the material and increases their motivation to learn. Around 75% of instructors also expressed a positive attitude toward the implementation of AI, noting that adaptive platforms help address students' individual needs by providing personalized recommendations for learning content and adjusting the difficulty of assignments according to each learner's knowledge level.

The study results also show that students using adaptive educational technologies demonstrate better academic performance. Approximately 70% of respondents noted that AI systems help them manage their study time more efficiently, while 65% reported that adaptive learning reduces stress associated with exam preparation. Additionally, 78% of students indicated that the use of AI increases their confidence in their own knowledge and promotes independent exploration of new topics.

Despite the positive results, certain limitations were identified. Specifically, 60% of instructors noted that the insufficient level of digital literacy among both teachers and students hinders the effective integration of AI into the educational process. Additionally, 55% of respondents expressed concerns regarding data privacy and the potential for algorithmic bias. Nevertheless, 80% of study participants agreed that AI-based adaptive technologies hold significant potential for improving the quality of education in Kazakhstan.

The study identified the main advantages of AI-based adaptive learning as follows:

- Enhanced personalization of the learning process (82%).
- Accelerated comprehension of complex topics (78%).
- Increased student engagement (76%).
- Automated feedback that helps correct mistakes in real time (70%).

However, despite these clear benefits, several limitations and challenges were also revealed:

- The need for technical support and infrastructure modernization (68%)
- Insufficient digital literacy among educators (60%)
- Concerns over data privacy and the protection of personal information (55%)
- The potential for algorithmic bias in AI systems (50%)

A comparative analysis with the findings of existing studies indicates that the identified trends align with global developments in the field of digital education. The implementation of AI-based adaptive educational platforms enhances learning efficiency; however, their successful integration requires a comprehensive approach. The analysis of literature and survey data confirms that AI-driven adaptive learning contributes not only to increased student motivation but also to improved academic achievement. Research demonstrates that such systems enable the personalization of the educational process, offering flexibility and an individualized approach to learning.

However, the implementation of AI in education requires overcoming a number of challenges, including issues related to teachers' digital literacy, the readiness of educational institutions to adopt new technologies, and potential ethical concerns associated with the use of AI algorithms. It is essential to consider the national characteristics of Kazakhstan's educational system to ensure that adaptive technologies are seamlessly integrated into existing curricula. Therefore, further research is needed to develop methodological guidelines and assess the long-term effects of AI usage in education.

Particular attention should be given to the pedagogical role of instructors in the context of AI-supported learning. Despite the automation of many processes, maintaining human interaction remains a key factor in successful education. Additionally, national educational contexts must be taken into account to facilitate the effective integration of adaptive technologies into the learning environment.

Overall, the findings of this study confirm that artificial intelligence is becoming a vital tool in adaptive learning, contributing to the personalization of the educational process and improving students' academic performance. However, its effective implementation requires substantial organizational and methodological changes. One of the key aspects is teacher training, as their level of digital literacy directly affects the success of AI integration into the teaching process. It is important not only to train educators in the use of digital tools but also to develop their competencies in the field of personalized learning.

In addition, the modernization of the digital infrastructure of educational institutions is of critical importance. Insufficient technological resources, low internet connectivity, and outdated software can significantly hinder the implementation of adaptive educational platforms. The development of a robust digital environment that supports the effective use of AI is a key factor in the successful deployment of these technologies.

Equally pressing is the need to develop ethical standards for the use of AI in education. Personalizing the learning process through AI algorithms requires the protection of students' personal data and the transparency of the algorithms that generate learning recommendations. Therefore, future research should focus on establishing a comprehensive approach that ensures both the ethical integrity and effectiveness of integrating artificial intelligence into Kazakhstan's educational system.

- Survey data indicate that 75% of students report increased motivation when using AI. More than half of the respondents noted that adaptive technologies make learning more engaging, allowing for deeper immersion in the subject matter. Additionally, 68% of students stated that the use of AI helps them better organize their study time, while 62% believe that adaptive technologies reduce stress levels before exams.

Instructors also view the application of AI in education positively. Seventy percent of educators indicated that adaptive platforms allow for more accurate monitoring of students' academic

performance and enable personalized adjustments to the learning process. However, 55% of teachers emphasized the need for additional training and professional development to effectively use new digital tools.

Overall, 80% of study participants agreed that the use of artificial intelligence contributes to the development of students' autonomy and fosters deeper engagement in the educational process.

- Analysis of test results confirms that students who learned through AI-supported platforms demonstrated, on average, 15% higher performance compared to those taught using traditional methods. Additional data show that 65% of students reported a significant improvement in understanding complex topics, while 72% expressed increased confidence in their knowledge. Educators also noted that the use of AI helps optimize the educational process by reducing the workload on teaching staff through automated feedback and personalized learning plans. These findings highlight the importance of further research in the field of adaptive learning, particularly in integrating artificial intelligence technologies into the curricula of higher education institutions in Kazakhstan.
- Graphs and data tables (to be included).

For the successful and effective implementation of adaptive educational platforms based on artificial intelligence technologies in Kazakhstan's education system, it is essential to follow a methodologically sound, step-by-step approach. Presented below is a phased model outlining the key stages and recommendations for carrying out this process within educational institutions.

Stage 1. Assessing the Readiness of the Educational Institution for AI Platform Implementation

The initial step involves a comprehensive evaluation of the institution's readiness to adopt AI technologies. At this stage, it is recommended to:

- Conduct an audit of existing technical resources, including internet speed, availability of computer and multimedia equipment, and the quality of software infrastructure.
- Assess the digital competencies of both instructors and students through surveys and questionnaires.
- Perform a SWOT analysis to identify the institution's strengths and weaknesses, as well as the opportunities and risks associated with the implementation of AI technologies.

Stage 2. Selection of an Adaptive Platform

Choosing an appropriate adaptive platform is a crucial element in the successful integration of AI into the learning process. At this stage, the following steps are recommended:

- Define clear selection criteria for the platform (e.g., user-friendly interface, personalization capabilities, technical support, compatibility with existing infrastructure, and alignment with Kazakhstani educational standards).
- Form a working group consisting of IT specialists, instructors, and administrative staff responsible for evaluating and testing the platform.
- Review successful Kazakhstani case studies of adaptive platform implementation, such as BilimLand, Kundelik.kz, and Platonus, assessing their experiences, benefits, and limitations.

Stage 3. Enhancing Digital Literacy of Instructors and Students

The level of digital literacy among instructors and students is critically important for the success of adaptive learning. Therefore, the following measures should be taken:

- Organize a series of training workshops and seminars for instructors to enhance their digital competencies and skills in using AI-powered platforms.
- Develop methodological guides and instructional materials that clearly explain the features of adaptive systems, guidelines for their use, and methods for assessing learning outcomes.
- Conduct orientation sessions for students to introduce the functionalities of adaptive platforms, highlighting their benefits and usage protocols.

Stage 4. Pilot Implementation and Testing of the Adaptive Platform

At this stage, the platform is introduced in a test mode for a limited group of users to identify potential issues and address them promptly. The following actions are recommended:

- Select an experimental group of students and instructors to pilot the platform.

- Organize regular monitoring and collect feedback from participants involved in the pilot project.
- Prepare a report summarizing the outcomes of the pilot phase, including identified benefits, challenges encountered, and recommended solutions.

Stage 5. Full-Scale Implementation

Following the successful completion of the pilot phase, the platform can be rolled out across the entire educational institution. The following steps are recommended:

- Develop a detailed integration schedule for the adaptive platforms across the institution, specifying responsible personnel and key deadlines.
- Establish a system for ongoing technical support and user consultation.
- Continuously monitor and evaluate the quality of the educational process, utilizing analytics provided by the AI platform to identify issues and make timely, data-driven decisions.

Stage 6. Evaluation of Effectiveness and Adjustment of the Implementation Process

Regular evaluation of effectiveness is an essential part of the implementation methodology. The following actions are recommended:

- Conduct interim and final surveys among students and instructors to assess satisfaction and motivation levels.
- Use the platform's built-in analytics tools to evaluate changes in students' academic performance.
- Hold regular discussions with instructors and technical staff to address emerging challenges and promptly adjust educational strategies and platform settings as needed.

Stage 7. Development and Adherence to Ethical Standards for Data Usage

Particular attention should be given to data privacy and protection issues. The following steps are essential:

- Formulate clear ethical guidelines and regulations for the processing of personal data, ensuring transparency and security.
- Train instructors and technical staff on the standards and protocols for handling personal data.
- Implement a privacy policy and regularly inform students about how their data is collected, processed, and used.

The implementation of the proposed methodological recommendations will enable educational institutions in Kazakhstan to effectively and smoothly integrate artificial intelligence technologies into the learning process. It is important to recognize that the success of adaptive platform implementation largely depends on a systematic approach, the active involvement of all stakeholders in the educational process, and the timely resolution of emerging issues.

For the successful integration of AI-based adaptive educational platforms into Kazakhstani institutions, a systematic and comprehensive approach is essential. A critical condition for effective implementation is the preliminary assessment of the readiness of both instructors and students. In this regard, we have developed practical tools—such as questionnaires, checklists, and guidelines—that facilitate an objective evaluation of digital literacy levels and support a seamless transition to the new learning format.

Questionnaire for Assessing Instructors' Readiness to Use Adaptive AI Platforms

Purpose: To determine the level of digital literacy and readiness of instructors for the integration of adaptive AI-based platforms.

We kindly ask you to respond honestly and objectively. Your answers will help ensure the effective implementation of adaptive learning technologies.

Instructor's Full Name:

Specialization/Department:

*Years of Teaching Experience***:**

Please rate the following statements on a scale from 1 to 5 (1 – Strongly Disagree, 5 – Strongly Agree):

№	*Question*	1	2	3	4	5
1	I am proficient in basic computer skills.					
2	I feel confident using digital tools in the teaching process.					
3	I am familiar with platforms such as BilimLand, Kundelik.kz, and Platonus.					
4	I have experience using platforms that incorporate artificial intelligence technologies.					
5	I understand how adaptive platforms work and can explain this to students.					
6	I am willing to learn how to use new digital tools and platforms.					
7	I consider the integration of adaptive AI platforms into the educational process important.					
8	I am confident that using AI platforms will enhance students' learning outcomes.					
9	I have no concerns regarding data privacy when using AI platforms.					
10	I am ready to engage in continuous professional development in the use of digital educational technologies.					

Questionnaire for Assessing Students' Readiness to Use Adaptive AI Platforms

Purpose: To determine the level of digital literacy and readiness of students for learning with adaptive AI-based platforms.

Full Name (optional):

Faculty / Year of Study:

Please rate the following statements on a scale from 1 to 5 (1 – Strongly Disagree, 5 – Strongly Agree)

	Question					
	I have reliable access to a computer and high-speed internet at home or in the dormitory.					
	I am proficient in using various digital educational platforms (BilimLand, Kundelik.kz, Platonus).					
	I am willing to learn using new platforms that incorporate artificial intelligence.					
	I learn how to use new digital tools and programs with ease.					
	Using AI-based platforms seems interesting and useful to me.					
	I believe adaptive platforms can improve my academic performance and motivation to learn.					
	I feel comfortable working independently with educational platforms.					
	I have no concerns about the privacy of my data when working with AI platforms.					

Checklist for Instructors: Preparing for the Implementation of AI-Based Platforms

Purpose: To assess the readiness of the educational institution and instructors for the implementation of adaptive AI-powered educational platforms.

Please verify whether the following actions have been completed prior to implementation:

– Assessment of technical resources has been conducted (availability of computers, stable internet connection).

– An audit of digital literacy levels among instructors and students has been carried out.

– Training sessions and webinars for instructors have been organized.

– Introductory sessions for students on the use of adaptive platforms have been held.

– A user guide for working with the platform (for both instructors and students) has been developed.

– Individuals responsible for the technical support of the platform implementation have been appointed.

– A plan for monitoring and collecting feedback after the launch has been prepared.

– Guidelines for the use of personal data within the institution have been formulated and published.

Instructor Guide for Using an Adaptive AI-Based Platform (Template)

Stage 1: Login

- Open the platform's website and enter your username and password.
- Check whether your course appears in your personal dashboard.

Stage 2: Course Setup

- Upload learning materials (presentations, videos, tests).
- Configure adaptive learning settings (difficulty levels, sequencing of content).

Stage 3: Monitoring Student Progress

- Regularly review analytics on student performance.
- Pay attention to individualized adjustments recommended by the platform.

Stage 4: Feedback

- Frequently request feedback from students on their experience with the platform.
- Discuss identified challenges and potential solutions with colleagues.

The use of these practical tools will enable educational institutions in Kazakhstan to approach the integration and effective use of adaptive AI-based platforms in a systematic and high-quality manner.

Prospects for Further Research

The prospects for research on the application of adaptive educational platforms based on artificial intelligence in Kazakhstan encompass several important and timely directions. These areas of study aim to deepen the understanding of the long-term effects of such technologies and their impact on various aspects of student development.

One of the most critical directions for future research is the investigation of the long-term educational outcomes of adaptive learning supported by artificial intelligence. It is essential to analyze how students' academic performance evolves over several years of using adaptive platforms. This involves conducting longitudinal studies to assess the sustainability of acquired knowledge and skills, as well as to compare the effectiveness of traditional and AI-driven learning approaches over time.

Another significant area of research is the study of AI's impact on students' cognitive and metacognitive skills. This includes exploring how adaptive platforms contribute to the development of critical and creative thinking, information analysis, and independent problem-solving abilities. In particular, it is important to determine how AI technologies support the development of self-organization, academic planning, and a conscious approach to learning. Such research may involve psychological assessments, surveys, and neuropsychological methods to evaluate changes in cognitive functioning.

Equally important is the investigation of the ethical and psychological dimensions of AI implementation in education. An important issue in this context is the study of how students and teachers psychologically perceive AI tools, their level of trust, and the potential barriers they face when interacting with artificial intelligence. Research is also needed to develop ethical standards for the use of data and algorithms in educational AI systems, to prevent digital discrimination, and to ensure the privacy of personal information.

Particular attention should be given to analyzing the impact of adaptive learning on students' motivation and emotional well-being. It is important to understand how the use of adaptive platforms influences students' attitudes toward learning, and whether it reduces or, conversely, increases levels of stress and anxiety. Research involving methods for analyzing students' emotional states (such as emotion recognition technologies, biometric indicators, etc.) may also hold great promise.

Finally, research in the field of teaching methodology using adaptive platforms is considered promising. It is important to explore which pedagogical approaches are most effective when using AI tools and how the role of the teacher evolves in the new digital environment. This will require the development and testing of new methodological guidelines and educational models aimed at achieving an optimal balance between human and technological factors in the learning process.

Thus, the outlined directions for future research will help not only to more effectively integrate artificial intelligence into Kazakhstan's educational environment but also to fully unlock its potential for improving the quality and accessibility of education.

Conclusion. Thus, the results of the conducted study confirmed the high significance of using artificial intelligence (AI) technologies in adaptive learning for educational institutions in Kazakhstan. The analysis of theoretical and empirical data showed that the implementation of AI-based adaptive platforms contributes to the individualization of the learning process, significantly increases student engagement and motivation, and also improves their academic performance.

An important contribution of this study was the examination of the practical experience in using adaptive educational platforms such as Platonus, BilimLand, Kundelik.kz, and Daryn Online, which have already proven their effectiveness in Kazakhstan's educational environment. The presented analysis confirmed that these platforms effectively address the tasks of personalized learning, prompt diagnosis of knowledge gaps, and the development of individual learning paths, significantly enhancing the quality of the educational process.

However, the study identified certain limitations and challenges associated with the implementation of AI in Kazakhstan's educational system. Among the main challenges are the insufficient level of digital literacy among teachers and students, the need to modernize technical infrastructure, as well as issues related to data privacy and potential algorithmic bias. To overcome these barriers, we proposed specific methodological recommendations, including a step-by-step model for integrating adaptive platforms, tools for assessing the readiness of educational institutions and teachers, as well as guidelines and checklists to facilitate the practical implementation of this process.

Special attention in the study was given to the prospects for further exploration of the impact of adaptive AI technologies on the educational process. Among the priority areas for future research are the long-term effects of adaptive learning on students' academic performance and cognitive development, the exploration of emotional and motivational aspects of AI use, as well as an in-depth investigation of the pedagogical and ethical dimensions of applying artificial intelligence in education.

Thus, the implementation of adaptive educational platforms based on artificial intelligence is a promising direction for the development of Kazakhstan's education system, contributing to the creation of a modern, personalized, and inclusive learning environment. However, the success of this process largely depends on a comprehensive approach that includes pedagogical, methodological, technical, and regulatory support, as well as active collaboration among all participants in the educational process. Further research in this field will enable the development of evidence-based recommendations and a strategy for the effective use of artificial intelligence technologies in the education system of Kazakhstan.

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К.А.Бекбенбетова,[1] Д.М.Поляк[1]*

[1]Абай атындағы Қазақ ұлттық педагогикалық университет, Алматы қ., Қазақстан

ҚАЗІРГІ ЗАМАНҒЫ ДРАМАНЫҢ СТУДЕНТТЕРДІҢ АЗАМАТТЫҚ ЖӘНЕ МӘДЕНИ БІРЕГЕЙЛІГІН ҚАЛЫПТАСТЫРУДАҒЫ ПЕДАГОГИКАЛЫҚ ӘЛЕУЕТІ

Аңдатпа

Мақалада Қазақстанның қазіргі заманғы драматургиясы ЖОО-ның оқыту әдістемелерін жаңартуды талап ететін филологиялық және педагогикалық талдаудың күрделі нысаны ретінде қарастырылады. Зерттеудің өзектілігі жаңа пьесаның жанрлық гибридтілігіне, оның цифрлық және орындаушылық ортаға енуіне, әлеуметтік-сыни мәселелердің күшеюіне және көркем тілдің екітілді сипатына байланысты. Жұмыстың мақсаты – студенттердің заманауи драмалық мәтінді игеру кезінде туындайтын қиындықтарының себептерін анықтау және оны болашақ әдебиет мұғалімдерін даярлау жүйесінде түсіндіру моделін жасау. Зерттеуде драмадан кейінгі театрдың, нарратологияның, мәдени антропологияның және лингвомәдениеттанудың теориялық тәсілдері жинақталып, қазақстандық пьесалар «жаңа драманың» әлемдік үрдістерімен салыстырылды. Кейіпкердің бейнесін өзгертуге, қақтығысты дискурс пен жады саласына ауыстыруға, ремарка мен сахналық көрнекіліктің рөлін күшейтуге ерекше назар аударылады. Сюжет пен кейіпкерге бағытталған дәстүрлі талдау сызбалары іс-әрекет фрагменттелген және мағынасы сөз, қимыл және