DOI: https://doi.org/10.69722/1694-8211-2024-56-190-197
УДК: 37:004.8

Kabassova K. A., *master of foreign languages,*
PhD student of KNU named after Zh.Balasagyn kkabasova74@mail.ru
ORCID: 0000-0002-9257-8445
WKU named after M. Utemisov, Uralsk, Kazakhstan

THE PROCESS OF DIGITALIZATION AND INTEGRATION OF AI INTO EDUCATION IN KAZAKHSTAN

The article reveals the topic of the process of digitalization in the globalization system and provides information on the directions and priorities for the implementation and digitalization of all levels in the Republic of Kazakhstan and examines in more detail the impact of the integration of artificial intelligence (AI) on the education sector. New opportunities that AI provides, such as personalized learning, process automation, and improved data analytics, are discussed. At the same time, challenges related to data confidentiality, ethical aspects and the need to ensure equal access to educational resources are considered. Also covered are advanced AI technologies that are already being used in higher education, creating innovative teaching methods and helping to improve the educational process.

Keywords: *national program, digitalization, IT specialists, artificial intelligence, education, personalized learning, automation of educational processes, data analysis in education, ethics of education, data confidentiality.*

Кабасова К. А., *магистр,* ***докторант***
КНУ им. Ж. Баласагына

kkabasova74@mail.ru
ORCID: 0000-0002-9257-8445
ЗКУ им. М. Утемисова, г. Уральск, Казахстан

ПРОЦЕСС ЦИФРОВИЗАЦИИ И ИНТЕГРАЦИИ И ПРОБЛЕМА ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В ОБРАЗОВАНИИ КАЗАХСТАНА

В статье раскрывается тема процесса интеграции цифровизации в системе глобализации и дана информация о направлениях и приоритетах реализации и цифровизации всех уровней в Республике Казахстан, и более подробно рассматривается влияние интеграции искусственного интеллекта (ИИ) на сферу образования. Обсуждаются новые возможности, которые предоставляет ИИ, такие как персонализированное обучение, автоматизация процессов и улучшенный анализ данных. Вместе с тем, рассматриваются вызовы, связанные с конфиденциальностью данных, этическими аспектами и необходимостью обеспечения равного доступа к образовательным ресурсам. Также затронуты продвинутые технологии ИИ, которые уже находят применение в высшем образовании, создавая инновационные методы обучения и содействуя улучшению образовательного процесса.

Ключевые слова: *национальная программа, цифровизация, IT-специалисты, искусственный интеллект, образование, персонализированное обучение, автоматизация образовательных процессов, анализ данных в образовании, этика образования, конфиденциальность данных.*

Кабасова К.А., магистр, докторант
Kkabasova74@mail.ru
ORCID: 0000-0002-9257-8445
М. Утемисов ат. БКУ
Уральск ш., Казакстан

КАЗАКСТАНДЫН БИЛИМ БЕРҮҮСҮНДӨГҮ САНАРИПТЕШТИРҮҮ ЖАНА ИНТЕГРАЦИЯ ПРОЦЕССИ ЖАНА ЖАСАЛМА ИНТЕЛЛЕКТ ПРОБЛЕМАСЫ

Макалада глобалдашуу системасындагы санариптештирүүнү интеграциялоо процесси ачылып берилип, Казакстан Республикасында бардык деңгээлдерди санариптештирүүнү жүзөгө ашыруунун багыттары жана артыкчылыктары тууралуу маалымат берилген, жасалма интеллекттин билим берүү чөйрөсүнө интеграцияланышынын таасири кыйла кенен каралган. ЖИ сунуш кылган персоналдаштырылган окутуу, процесстерди автоматташтыруу жана жакшыртылган маалыматтар базасы сыяктуу жаңы мүмкүнчүлүктөр талкууга алынат. Ошону менен бирге эле, маалыматтардын купуялуулугу, этикалык аспектилер жана билим берүү ресурстарына тең укуктуу жетүүнү камсыздоо зарылдыгы менен байланышкан кооптуулуктар да каралган. Ошондой эле ЖИнин жогорку билим берүүдө колдонула баштаган алдыңкы технологиялары тууралуу да сөз болот. Алар окутуунун инновациялык методдорун пайда кылып, билим берүү процессин жакшыртууга өбөлгө түзүүдө.

Түйүндүү сөздөр: *улуттук программа, санариптештирүү, IT- адистер, жасалма интеллект, билим берүү, персоналдаштырылган окутуу, билим берүү процесстерин автоматташтыруу, билим берүүдөгү маалыматтарды анализдөө, билим берүү этикасы, маалыматтардын купуялуулугу.*

In the Message to the people of Kazakhstan "Economic course of a Fair Kazakhstan" dated 09/01/2023, Head of State K. K. Tokayev noted [1] that the widespread introduction of new concepts and technologies, such as artificial intelligence, blockchain, Internet of Things (IoT) and Big Data (Big Data), leads to changes in the rules of the game in almost all industries: from agriculture to finance. The question of what place humanity will give to artificial intelligence in its life is urgently on the agenda, and there is a lot of debate around it. But be

that as it may, Industry 4.0 is entering our lives with confident steps. Be it education, medicine or management, new technologies are emerging everywhere, and this process cannot be stopped.

With the development of artificial intelligence (AI) technologies in the world, new horizons are opening up for the transformation of the education sector. This article explores how the integration of AI into educational processes opens the door to innovation and the challenges that come with it. Artificial intelligence allows you to create personalized educational programs, taking into account the individual needs and learning styles of each student. Machine learning algorithms analyze learning data to provide students with content and activities that are appropriate to their level of knowledge and abilities. The use of AI in education leads to the automation of many aspects of the educational process. This includes creating individual learning plans, automating assignment review, adaptive testing, and even supporting teachers in the process of assessing and analyzing student performance. Artificial intelligence provides powerful tools for analyzing educational data. Tracking progress, identifying weaknesses, predicting student success - all this becomes more accurate and efficient thanks to AI algorithms, which helps optimize educational strategies and resources. Advanced artificial intelligence technologies are already finding application in higher education, creating innovative teaching methods and helping to improve the educational process. An example of such use is the introduction of automated systems for assessing and analyzing student work. These systems, based on machine learning algorithms, are able to identify key aspects work, assess the level of creativity and provide feedback to students. With new opportunities for AI in education comes ethical questions. Innovation must be balanced with ensuring data privacy and equitable use of technology. It is important to develop education ethics standards that ensure fair and safe use of data in education. Forecasting supported by artificial intelligence can significantly improve the planning of educational programs and resources. Data analytics algorithms can predict changes in student needs based on previous successes and challenges, allowing educational institutions to more effectively adapt to changing demands. Artificial intelligence can play a key role in optimizing the management of educational resources by providing analytics on the effectiveness of the use of educational materials, teaching staff and financial resources. Using AI, it is possible to more accurately analyze labor market requirements and predict changes in required competencies. This allows educational institutions to adapt their programs to current requirements, providing students with relevant and in-demand knowledge. With the increasing use of artificial intelligence in education, it becomes important to integrate ethical principles into the design and application of educational technologies. This includes ensuring algorithm transparency, protecting student data privacy, and developing standards for the ethical use of AI in education. The goal is to leverage AI tools and techniques to improve the learning experience for students, streamline administrative tasks for educators, and facilitate more effective educational outcomes. AI in education encompasses a wide range of applications and technologies designed to adapt, personalize, and optimize the teaching and learning experience. AI is a complex discipline with many theories, techniques, and technologies. Its main directions are the following:

•Machine learning is a field of knowledge that explores algorithms that are trained on data in order to find patterns. It uses neural network methods, statistics, and operations research to identify hidden useful information in the data;

•a neural network is a mathematical model, as well as its software or hardware embodiment, built on the principle of organization and functioning of biological neural networks;

•Deep learning uses complex neural networks with many neurons and layers. Increased computing power and advanced techniques are used to train these deep neural networks, as well as to detect complex patterns in huge amounts of data;

•cognitive computing is a field of artificial intelligence, the task of which is to ensure the process of natural human interaction with a computer, similar to interaction between people. The ultimate goal of artificial intelligence and cognitive computing is to simulate human cognitive processes by a computer through the interpretation of images and speech with the appropriate response; •Computer vision pattern recognition and deep learning for image and video recognition;

•Natural language processing is the ability of computers to analyze, understand, and synthesize human language, including spoken language. Now we can control computers using the usual language used in everyday life [8]. There are several advantages of AI in education: - Artificial intelligence systems can analyze the performance of individual students and adapt learning materials based on the space, style, and strengths of each student, providing a more personalized and effective learning process. AI-powered educational tools, such as chatbots, provide instant support and information to students at any time, creating a more flexible and accessible learning environment. Despite the numerous advantages, the integration of Artificial Intelligence (AI) in education also presents some challenges and potential disadvantages. For instance: -Access to AI-powered educational tools may not be uniform across all students, potentially widening educational inequalities. -Not all students may have equal access to technology or high-quality AI applications. AI lacks emotional intelligence and may struggle to understand and respond to the emotional needs of students. Human interaction and emotional support remain critical in the learning process. When we talk about AI or hear the news, almost everyone assumes that this is the big technological giant and has nothing to do with you. But little did they know that they were participating in our everyday life. I think most of us haven't even known that they are using Artificial Intelligence already. Here are some examples that prove us right:

• Google Everyone uses Google on a daily basis without even knowing it. However, it's an AI-based app too.

• Smart House The magical houses that do everything you want. Sounds like a lie, isn't it? But this house only works with artificial intelligence.

• Voice assistants When you want to ask a question or find something who do you ask? Of course, your digital voice assistants. They are Siri or maybe Alexa. Personally, I use Google every day for different reasons. That means I have been using AI all this time! Sounds incredible! Despite those facts, we are not stopping at this point. As we already mentioned Artificial Intelligence can be used everywhere. So we want to recommend some tools that are based on this. •ChatGPT - solves anything

•Copy.AI - writes everything

•Midjourney - creates art

•Soundraw.io - creates music

•Kaiber - creates videos

•Runway - edit videos Our list can go on and on, but these are the most important ones.

Currently, the digital ecosystem in the field of all levels of education in Kazakhstan is developed at a sufficient level due to digital services of both the IT market and the public sector. A significant contribution to the development of the foundations of digitalization of education was made by M.P. Karpenko and the scientific and educational school headed by him, the origins of which begin, in fact, under his leadership [2-4]. Today, many issues in the field of

digitalization of all levels of education are being successfully resolved in Kazakhstan. At present, there is a big issue with queues for kindergartens. In this regard, 44 information systems are used at the regional level for queuing, which leads to duplication of the queue and the lack of unified monitoring and data on the real need for places in kindergartens. In order to resolve this issue, it is planned to introduce a Unified Database of Queues for Kindergartens at a centralized level. This will allow for daily monitoring of places in kindergartens, queuing and issued referrals, saving budget funds and eliminating corruption risks in the distribution of places. At the same time, the Unified Queue Database will be integrated with the information systems of local executive bodies, the "electronic government" portal and second-tier banks for submitting applications for placement on a queue and issuing referrals for enrollment in kindergartens [5]. Automation of such processes as concluding contracts, maintaining timesheets and other functions will also remain with the information systems that are currently used in kindergartens. It is also planned to introduce electronic learning management systems (LMS) in preschool education with the maintenance of a child's profile (indicating social, medical and educational status, saving creative works) and digital educational resources (educational programs, curricula, teaching materials). In the field of secondary education, electronic school admission is currently available, electronic learning management systems (LMS) and digital educational resources are used. To further digitalize processes in schools, it is planned to introduce a digital portfolio of a teacher, where information will be collected on certification, advanced training, participation in competitions, as well as automation of the process of hiring teachers. Each student will have his own digital profile containing academic achievements, social GPA and a competency map. For the convenience of citizens, the availability of online services for enrollment and transfer between schools will be ensured through the eGov Mobile applications and second-tier banks [6].

In order to maximize the digitalization of the entire learning process, together with the Ministry of Digital Development, Innovation and Aerospace Industry of the Republic of Kazakhstan, special projects will be implemented to provide primary school students with mobile devices with a subscription to digital textbooks in order to unload their backpacks and to provide schools with high-speed Internet, ensuring high-quality Internet inside schools. For transparency and analysis, digitalization of the selection and monitoring of textbooks in schools is planned. Secondary education certificates will be issued with a QR code for authentication and will also be available digitally in the eGov Mobile account and second-tier bank applications. In the digitalization of technical and vocational education, a Unified Electronic Register of Educational Programs will be introduced, student profiles will be formed in LMS systems (academic achievements, social GPA, competency map), diplomas will also be issued with a QR code and will be available digitally on "eGov Mobile" and banking applications. Organizations of preschool, secondary education, colleges and universities will implement a systematic implementation of cloud accounting, cloud document flow and personnel records to monitor, control and reduce paper costs; the most popular services and payments will be provided through mobile applications [7]. Regarding the digitalization of public services, 40 public services are currently being implemented in the field of education, of which 34 are automated, and 6 are subject to automation. The introduction of a unified priority database in kindergartens will eliminate corruption risks in the distribution of places. For these purposes, 2 services will be optimized and transferred to a proactive format: placing children on the waiting list for kindergartens and enrolling children in kindergartens. Particular attention is paid to public services in the field of secondary education. The state service "Enrollment in additional education organizations" will be automated, and 2 state services "Enrollment in schools" and

"Transfer between schools" will be optimized. It is also important to make three services proactive: "Free and reduced-price meals in schools," "Individual home education for children," and "Enrollment in special education organizations for children with disabilities." In the field of technical and vocational education, it is planned to automate such public services as "Providing academic leave for technical and vocational education" and certificates for persons who have not completed technical and vocational education. State services "Acceptance of documents in organizations of technical and vocational education" and "Recognition of educational documents" will be optimized. Just like in schools, the state service "free and reduced-price meals for college students" will be proactive. For state services for the protection of children's rights, it is planned to automate 2 services: "Permission to visit a child for parents deprived of parental rights" and "Decision to take into account the opinion of the child." 5 public services will be optimized: a certificate for the disposal of the property of minors, the provision of recreation in country and school camps, the provision of free transportation to schools, the transfer of a child to foster care and the transfer of a child to a foster family. 2 services will be composite: establishing guardianship over a child and assigning payments in connection with adoption. For state services of the psychological, medical and pedagogical commission, the state service "Examination and provision of PMPC" will be optimized, and rehabilitation and social adaptation of children and adolescents with developmental problems will be a proactive service. It should be noted that the Information System "National Educational Database" (NEBD) contains more than 431 million units of personal data of 5.5 million pupils, students and teachers, as well as more than 3.6 million units of data on 21 thousand educational organizations. NOBD is the basis for compiling departmental reports, provides data through integration services to information systems of state bodies (Smart Data Ukimet, etc.). According to paragraphs 5-1 of paragraph 3 of Article 45 of the Law of the Republic of Kazakhstan dated July 27, 2007 No. 319 III "On Education", the head of the educational organization, in the manner prescribed by the laws of the Republic of Kazakhstan, is responsible for the inaccurate and (or) untimely submission of administrative data to the NEBD. In addition, the order of the Minister dated December 27, 2012 defines the collection of administrative data and departmental reporting in electronic format from the NEBD, as well as responsibility for the timeliness and quality of filling in the data in the NEBD. In accordance with paragraph 3 of Article 17 of the Law of the Republic of Kazakhstan dated November 16, 2015 "On Compulsory Social Health Insurance," the Ministry of Education and Science of the Republic of Kazakhstan provides information on preferential categories, in particular, full-time students for the calculation and payment of compulsory social health insurance contributions from the state budget. The information system of the Ministry of National Educational Database (hereinafter referred to as the NEBD) is integrated with the information system of the Ministry of Labor and Social Protection of the Population of the Republic of Kazakhstan (hereinafter referred to as the Ministry of Labor and Social Protection of the Population of the Republic of Kazakhstan) in terms of transmitting information on full-time students. The NEBD keeps records education, including for students of Kazakhstani universities and colleges. Filling out information about students is carried out directly by universities and colleges, which are responsible for the quality and correctness of the information filled out. In addition, through the "Automation of Public Services" subsystem of the NEBD, 48 public services of the Ministry are provided in electronic format. In order to ensure the protection of personal data stored in the information system, the NOBD IS was tested for compliance with information security requirements conducted by the State Technical Service of the National Security Committee of the Republic of Kazakhstan (Test Report No.

KZ55VQQ00052891 dated March 2, 2022) and put into commercial operation 4 March 2022 by the acceptance committee approved by order of the Minister of Education and Science of the Republic of Kazakhstan dated March 3, 2022 No. 73, which included representatives of the Ministry of Digital Development, Innovation and Aerospace Industry of the Republic of Kazakhstan. According to the instructions of the Head of State, the Joint Stock Company "Information and Analytical Center" is entrusted with the functions of creating, maintaining, system maintenance, integrating and ensuring information security of the IS "NOBD". These competencies are enshrined in additions and changes dated May 3, 2022 in Article 5 of the Law of the Republic of Kazakhstan "On Education". In order to ensure the relevance of information in the NEBD, it is proposed to develop the "Digital Profile of a Teacher" and "Digital Profile of a Student" Modules by the end of 2022, which will accumulate all the information, the correctness of which can be checked by the owner himself. It is planned to work on the issue of providing access to this module directly to teachers and students, or displaying data in the personal account of the e-Government Portal (education documents, status, transcripts, certificates, NCT, categories, advanced training, awards, etc.).

Thus, systematic work is being carried out in Kazakhstan to introduce digital technologies into various areas of education. These measures are already having concrete results and will undoubtedly improve the quality of educational services. Modern technologies make it possible to create unique educational scenarios adapted to the individual needs of each student. However, along with the undeniable advantages, it is necessary to pay attention to the ethical and confidential aspects of introducing artificial intelligence into education. It is important to balance the pursuit of innovation with ensuring the protection of student data and maintaining ethical standards. Ensuring transparency in the use of algorithms, protecting privacy, and maintaining ethical standards are becoming integral to the responsible implementation of technology in the educational environment. Creating equal opportunities for all students is also an important aspect. The use of artificial intelligence should serve as a tool to promote access to quality education for everyone, taking into account the diversity of needs and characteristics of each student. Only in this way will educational technology promote inclusivity and equity in education. The successful integration of artificial intelligence into education requires not only technical development, but also careful attention to ethical, social and legal aspects. Only under conditions of responsible use and ethical principles will educational institutions be able to fully realize the potential of modern technologies in providing quality and accessible education for all.

In conclusion, the integration of artificial intelligence and digitalization into the education sector opens the door to new opportunities, transforming traditional teaching methods and bringing with it high potential for increasing the efficiency and personalization of the educational process. AI is becoming an essential part of our life rapidly. Mankind thought that artificial intelligence would be here for a long time, maybe in 20 years or more. But, look around! Does it really look like 20 years? It's just around the corner. People should never say that AI is a long-termed project. Because it's already here.

Literature:

1. Message to the people of Kazakhstan from the Head of State K. K. Tokayev "Economic course of a Just Kazakhstan" dated 09/01/2023

2. Karpenko, M. P. Didactics of assessment: monograph. – M.: SSU Publishing House, 2017. – 136 p.

3. Karpenko, M. P. The priority is education. // Proceedings of the International Scientific

and Practical Conference "Strategic Priorities of Transformation of Society and Innovative Modernization of the Economy in the 21st Century, 2021. – pp. 68-75.

4. Karpenko, O. M. Education and socialization of students in an electronic information and educational environment. // Proceedings of the International Scientific and Practical Conference "Strategic Priorities of Transformation of Society and Innovative Modernization of the Economy in the 21st Century, 2021. – P. 76-82.

5. Muldakhmetov, Z. M., Gazaliev, A. M. Prospects for the digitalization of Kazakhstani education // Materials of the IV International Scientific and Practical Conference "Problems and ways to increase the efficiency and quality of modern higher education in the conditions of digitalization of Russian society", 2019. - pp. 34-37.

6. Tverdovskaya, A. V. Features of activities to form a balanced risk among modern entrepreneurs // Materials of the IV International Scientific and Practical Conference "Problems and ways to increase the efficiency and quality of modern higher education in the conditions of digitalization of Russian society", 2019. – pp. 292-298.

7. Krasovsky, Yu. D. Feedback between education and the digitalization of enterprises // Materials of the IV International Scientific and Practical Conference "Problems and ways to improve the efficiency and quality of modern higher education in the conditions of digitalization of Russian society", 2019. – pp. 174-183.

8. URL:https://www.executive.ru/wiki/index.php/ искусственный_интеллект