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БИЛИМ БЕРҮҮДӨГҮ ЖАСАЛМА ИНТЕЛЛЕКТ

ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ В ОБРАЗОВАНИИ

ARTIFICIAL INTELLIGENCE IN EDUCATION

Аннотация: Макалада билим берүүдө жасалма интеллектти (ЖИ) колдонуунун актуалдуулугу талкууланат. Окутууну жекелештирүү, окуу маалыматтарынын жакшыртылган анализи жана билим берүү ресурстарына жетүү сыяктуу АИ колдонуунун артыкчылыктары талкууланат. Авторлор ЖИ технологияларын колдонуу менен критикалык ой жүгүртүү жана коммуникация сыяктуу келечектеги көндүмдөрдү өнүктүрүүнүн маанилүүлүгүн белгилешет. Макала билим берүүнүн сапатын жана жеткиликтүүлүгүн жогорулатуунун каражаты катары билим берүү тармагында ЖИ ны колдонууга чакырат.

Негизги сөздөр: жасалма интеллект, билим берүү, окутууну персоналдаштыруу, окуу маалыматтарын талдоо, билим берүү ресурстарына жетүү, келечектин көндүмдөрү

Аннотация: В статье рассматривается актуальность применения искусственного интеллекта (ИИ) в образовании. Обсуждаются преимущества использования ИИ, такие как персонализация обучения, улучшение анализа данных обучения и доступ к образовательным ресурсам. Авторы подчеркивают важность развития навыков будущего, таких как критическое мышление и коммуникация, с помощью технологий ИИ. Статья призывает к использованию ИИ в образовании как средства улучшения качества и доступности образования для всех.

Ключевые слова: искусственный интеллект, образование, персонализация обучения, анализ данных обучения, доступ к образовательным ресурсам, навыки будущего.

Abstract: The article discusses the relevance of the use of artificial intelligence (AI) in education. The benefits of using AI are discussed, such as personalization of learning, improved analysis of learning data, and access to educational resources. The authors emphasize the importance of developing future skills such as critical thinking and communication using AI technologies. The article calls for the use of AI in education as a means of improving the quality and accessibility of education for all.

Keywords: artificial intelligence, education, personalization of learning, analysis of learning data, access to educational resources, skills of the future.

Artificial intelligence

Artificial intelligence (AI) has become one of the key technological trends in education, transforming the

ways of learning and knowledge management. In today's world, where digitalization is penetrating all spheres of life, including education, the use of AI in the educational process is not only an opportunity, but also a necessity. The active use of AI allows for personalization of education, taking into account the individual needs and pace of assimilation of information by each student. AI technologies also contribute to the development of new methods of analyzing learning data, which helps to improve the effectiveness of educational programs and predict the needs of students.

The use of AI in education also provides access to educational resources and subject matter experts that were previously unavailable to many. This is especially true in regions with insufficient infrastructure or limited learning opportunities. In addition, AI can help develop future skills such as critical thinking, problem solving, and communication, which are becoming increasingly important in a rapidly changing world.

Thus, the topic of using AI in education is relevant and important, as it reflects not only technological progress, but also the desire to improve the quality and accessibility of education for all.

John McCarthy first used the term AI in 1955, and he defined it as “a requirement for a machine to behave in a way that would be considered intelligent if a human being behaved in that way” (Islamgereeva Y.S., Merzlikina I.V., 2023:38).

In 1950, Alan Turing introduced the idea that computing systems could eventually acquire the ability to think like humans. He envisioned that automated systems would be able to perform calculations beyond human capabilities based on logic. These calculations are largely based on the binary system, and the fundamental question is how such binary calculations can be interpreted in a human context. Games and theorem proving are early attempts to make computers think logically or intelligently, like humans. AI often refers to machines that can perform cognitive functions in a way that

AI is a fast-growing field that spans the empty boundaries of interdisciplinary subjects from mathematics to engineering and from computer science to philosophy and linguistics. Due to its interdisciplinary nature, there is little agreement among AI experts on its overall definition and understanding. It facilitates the process of effective decision-making, in games, etc., and is also expanding its applications in the field of education and learning. Keeping in mind the tools and services related to AI, its presence in higher education has been noted. Interestingly, many educators are still unaware of its importance, scope, and what it consists of. Considering the abovementioned problem arising due to teachers' lack of awareness about the use of AI in education, this study aims to further explore the applications of AI in education, its scope in education and learning (Islamgereeva Y.S., Merzlikina I.V., 2023:42).

Educational systems

An intelligent system (IS) is a technical or software system capable of solving problems traditionally considered creative, belonging to a specific subject area, the knowledge of which is stored in the memory of such a system. The structure of an intelligent system includes three main blocks – a knowledge base, a decision-making mechanism, and an intelligent interface. Intelligent systems are studied by a group of sciences united under the name "artificial intelligence". In decision-making technologies, an intelligent system is an information and computing system with intellectual support that solves problems without the participation of a person – a decision maker (DM), in contrast to an intellectualized system in which an operator is present (Shaitura S.V., 2016:7).

An intelligent system that interacts with information and provides knowledge testing to the learner is known as an intelligent tutoring system (ITS). It is one of the sophisticated ways of presenting information to the learners. Like a teacher, it teaches each learner according to their level of knowledge and priorities. ITS can teach the learners in the following way. Initially, it teaches and presents the theory etc. with examples. Then, the IT asks questions to the learners. It has the ability to understand the answers given by the learners and determine their knowledge, which influences what should be presented and asked from the learner. The learner can also ask questions and the system is able to answer or solve problems in a particular area of knowledge. Researchers are interested in developing effective ITS that can teach various subjects including equation solving, physics, mathematics and grammar. An intelligent tutoring system requires the following inputs:

1. Knowledge and understanding of the course being taught, teaching strategies, misconceptions and potential errors.
2. The experience gained by the system as a result of interaction with students. It includes the know-how of students' mistakes, students' efforts to learn, and their general information.

3. Preferences or priorities of each topic required for the students' performance level and the cost of use.

4. Observe student interaction and test results. The results of the ITS are the information/material presented, the answers to the questions asked, the required test, and reports for parents and teachers.

ITS design consists of four stages:

1. needs assessment,
2. cognitive task analysis,
3. tutor implementation and assessment.
4. learning, outcomes, curriculum structure and definition of objectives.

Planning takes into account the possible behavior of students when completing tasks or interacting with the system.

In the second stage, cognitive task analysis involves systems programming to create a proper computational model that meets the requirements. Expert interviewing, think-aloud research, and observation of learning behavior and the learning process are used to develop a domain model.

The initial implementation of the tutor occurs in the third stage of ITS design and includes the development of an environment that supports the learning process in an authentic form.

In the final stage, evaluation processes are carried out, including pilot testing, evaluation formation, parametric studies and final evaluation.

Smart learning

Smart learning (SL) is related to the development of intelligent devices based on intelligent technologies. Smart learning is also understood as Smart Learning (SL). Technology is not only related to other areas of life but also to education and can be used in the educational environment to help students in the learning process. It is called "technology-enhanced learning". Technology improves the way of learning through various means and tools to extract learning content, communication, assessment and expression in the learning process using technology. This direction of solving students' educational problems attracts many researchers. Researchers of different professions define SL differently. Some consider it context-sensitive, universal. Another study believes that it is more focused on content and students than on its technology, although the technological infrastructure is advanced and intelligent. The role of technology in supporting the learning process is inevitable, but the focus should be on the content and students, not on smart devices (Islamgereeveva Y.S., Merzlikina I.V., 2023:44).

Smart learning combines the benefits of universal access to education and social interaction. It is an educational concept that is focused on the needs and interests of students and the use of technology. Its goal is to improve the quality of learning and student achievement throughout the learning process. Smart learning focuses on contextual, personalized and transparent learning that promotes the development of intelligence and problem-solving abilities in real-life situations. Students are given the opportunity to learn flexibly, anytime and anywhere, and to collaborate with each other.

The application of smart technologies is expected to change teaching and learning methods and educational strategies. As SL integrates smart technologies into education, new pedagogical approaches are needed to enable students and teachers to integrate technologies into their goals. Although many studies consider SL from different perspectives, its definition has not yet been fully established, as the concept is only being formed, both technologically and substantively.

The characteristics of SL include motivation, self-direction, adaptability, technologyembeddedness, and resource orientation. It can be formal or informal, personalized or situational, social or collaborative, with an emphasis on content and application. SL is made possible by the use of smart technologies and embedded artificial intelligence. More advanced technologies will provide more opportunities and improve learning outcomes. By focusing on contextual and personalized learning, SL will enhance students' intelligence and problem-solving skills in the real world, and students will be able to learn without time and place constraints, with a more collaborative approach. **Social robots**

Robot tutor helps to engage the student in the learning process and cheers up him. This is especially useful in individual learning. Scientists have long been working on devices that help would be for children with mental and physical developmental features. And ordinary children who do not cope with studying, such a robot was would be useful, because cars in literally inhuman patience: a calm reaction to errors and ability to endlessly repeat the material. For especially friendly associations, robot tutors are usually made similar on toys. By the way, the first such robot was released in Japan still in 2000 year, it was called IROBI.

December 6, 2022, the website Atlantic published an article of Stephen Marche "The College Essay Is

Dead. No One Is Ready for How AI Will Transform Academia". An analysis of articles published in 2023 in foreign and Russian media highlighted the advantages and disadvantages of artificial intelligence used for educational purposes. ChatGPT is becoming a tool for writing essays, essays, and other works, an assistant in the process of grading and analyzing errors, and an effective way to develop critical thinking in students. While ChatGPT-4 demonstrates the ability to provide an individualized approach to learning by creating tasks, offering recommendations, and creating learning plans for each student, all while saving time and resources, there are concerns about the impact of the neural network on traditional teaching methods and the threat of losing individual adaptation. Martin Frontskevich emphasizes that students' constant reliance on technology to complete tasks and find answers can lead to the loss of their own learning skills. In general, the use of artificial intelligence for educational purposes is considered possible. ChatGPT -4 can help improve the quality of education by improving the ways of interaction between teachers and students. It is likely that each teacher has the right to decide for themselves how to effectively and efficiently use this technology in the course of teaching.

Amanda Werner on the podcast "Amanda on Air" also discusses the pros and cons of an AI tool like ChatGPT.

She identified seven key points:

1. Using ChatGPT to create texts will help shift the focus from mechanically learning the structure of typical essays and other standard formats to developing critical thinking, research skills, and creativity through various multimedia forms.
2. ChatGPT can be an effective feedback tool for students, facilitating the process of editing and proofreading their texts.
3. Using ChatGPT to grade assignments and provide feedback improves the grading process and gives students the opportunity to revise their assignments based on the feedback received before final submission.
4. Collaborative interaction with ChatGPT allows students to improve their text editing skills. 5. Homework is not an integral part of the educational process, so the use of artificial intelligence here does not pose serious threats.
6. ChatGPT as a tool for developing critical thinking can be used in teacher-led discussions of analytical and philosophical issues.
7. The ability to use ChatGPT to find and explore new, reliable information simplifies the research process (Verner A., 2024).

Amanda Werner is optimistic about the prospects for using artificial intelligence in education, emphasizing that teachers' main concern is the fear of uncertainty. However, technological developments and changes in artificial intelligence do not affect interpersonal communication, which remains an important aspect of education.

It is known that many teachers in educational institutions fear that artificial intelligence can be a hindrance to learning and even a tool for fraud on the part of schoolchildren. Kevin Rose, author of the article "Don't Ban ChatGPT. Teach with It," posted on The New York Times January 12, 2023, believes that ChatGPT has a place in the educational process (Rose K., 2023). He clarifies that there is no way to completely prohibit students from using artificial intelligence, so one way or another it will still penetrate the course of study despite the bans. Some teachers are pinning their hopes on programs to detect letters created by artificial intelligence. The author of the above article is convinced that these methods of regulation often lead to failures, because they can often be fooled by changing the code or using another neural network. Since artificial intelligence is constantly evolving and new developments appear, teachers cannot keep track of each new version of the chat in order to block it.

Concerns about the use of ChatGPT in education are indeed well founded. There have already been several cases where the neural network has provided incorrect information. For example, on April 4, 2023, Rossiyskaya Gazeta published a note Pavla Melnik under the name "Will Artificial Intelligence Replace Programmers?" It says that Google's AI tool Bard incorrectly answered the question: What new discoveries from the James Webb Space Telescope can I tell a 9-year-old about? The bot reported that the telescope was used to take the first ever images of a planet outside the solar system. In reality, the first such image was taken by a team of scientists led by Gael Chauvin using an adaptive optics tool. The error was quickly spotted by users, and Google shares plummeted by \$100 billion (Melnik P., 2023).

Conclusion

Of course, the use of artificial intelligence in education is considered a promising and innovative approach

that can significantly improve the educational system. Tools based on artificial intelligence can individualize learning, which makes it more effective.

The role of artificial intelligence in education is in its intelligent teaching methods, communication, analysis and assessment of students, as well as supervision, process management and optimization. AI technology performs all the necessary tasks for both teachers and students. It should ensure communication in such a way that the language and terminology used by users are understandable and meaningful.

The use of artificial intelligence in education is of great importance because it enriches the teaching methods with new technologies and procedures. It attracts researchers from various disciplines to study a wider range of issues related to education. It is obvious that AI and its role in education are interdisciplinary and many problems beyond the scope of traditional education can be easily solved with its help.

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