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TO ORGANIZE AND EVALUATE THE SELF-STUDY OF STUDENTS OF HIGHER EDUCATIONAL INSTITUTIONS IN SUBJECTS USING ARTIFICIAL INTELLIGENCE

Annotation. *This article presents the results of scientific research into using modern information technology and methods to help students learn independently in various disciplines. Artificial intelligence is currently being used to explore all areas. It is also intended for widespread use in education. In this article, we will examine how students can utilize artificial intelligence for independent learning, drawing on our experience. In the context of a modular credit system in higher education institutions, students learn to make the most of modern IT technologies and their software and technical tools, as well as new methods of applying these technologies to teaching and learning. This provides students with ample opportunities to gain knowledge through e-learning systems using artificial intelligence, as well as to assess the knowledge gained. This involves applying information and communication technologies to teaching, creating wide opportunities for students to gain knowledge through electronic teaching systems using artificial intelligence to organize independent study.*

Keywords: *AI- artificial intelligence, IT, LMS, E-learning, ICT, IT in E.*

ОРГАНИЗАЦИЯ И ОЦЕНКА САМОСТОЯТЕЛЬНОЙ РАБОТЫ СТУДЕНТОВ ВЫСШИЕ УЧЕБНЫЕ ЗАВЕДЕНИЯ ПО ДИСЦИПЛИНАМ, ИСПОЛЬЗУЮЩИМ ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ

Аннотация. *В данной статье представлены результаты научных исследований по использованию современных информационных технологий и методов, помогающих студентам самостоятельно осваивать различные дисциплины. Искусственный интеллект в настоящее время используется для изучения всех областей. Он также предназначен для широкого использования в образовании. В этой статье мы рассмотрим, как студенты могут использовать искусственный интеллект для самостоятельного обучения, опираясь на наш опыт. В контексте модульно-кредитной системы в высших учебных заведениях студенты учатся максимально эффективно использовать современные IT-технологии и их программные и технические средства, а также новые методы применения этих технологий в преподавании и обучении. Это предоставляет студентам широкие возможности для получения знаний с помощью систем электронного обучения с использованием искусственного интеллекта, а также для оценки полученных знаний. Это предполагает применение информационно-коммуникационных технологий в обучении, создание широких возможностей для получения студентами знаний с помощью электронных обучающих систем, использующих искусственный интеллект для организации самостоятельной учебы.*

Ключевые слова: *ИИ- искусственный интеллект, информационные технологии, LMS, электронное обучение, ИКТ, IT в электронном виде.*

TALABALARNING MUSTAQIL O'QISHINI TASHKIL ETISH VA BAHOLASH SUN'IY INTELLEKTDAN FOYDALANADIGAN FANLAR BO'YICHA OLIY O'QUV YURTLARI

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Annotatsiya. *Ushbu maqolada talabalarga fanlarni mustaqil ravishda o'zlashtirishga yordam beradigan zamonaviy axborot texnologiyalari va usullaridan foydalanish bo'yicha ilmiy tadqiqotlar natijalari keltirilgan. Sun'iy intellekt hozirda barcha sohalarni o'rganish uchun foydalanilmoqda. Shuningdek, u ta'lim sohasida keng foydalanish uchun mo'ljallangan. Ushbu maqolada biz talabalar mustaqil ta'lim olishlarini o'z tajribamizga asoslanib, mustaqil ta'lim mavzularini o'rganish uchun sun'iy intellektdan qanday foydalanishlari mumkinligini ko'rib chiqamiz. Oliy o'quv yurtlarida modulli kredit tizimi kontekstida talabalar zamonaviy IT-texnologiyalar va ularning dasturiy va texnik vositalaridan, shuningdek, ushbu texnologiyalarni o'qitish va o'qitishda qo'llashning yangi usullaridan maksimal darajada foydalanishni o'rganadilar. Bu talabalarga sun'iy intellektdan foydalangan holda eLearning tizimlari orqali bilim olish hamda olingan bilimlarni baholash uchun keng imkoniyatlar yaratadi. Bu o'qitishda axborot-kommunikatsiya texnologiyalaridan foydalanishni, mustaqil ta'lim olishni tashkil qilish uchun sun'iy intellektdan foydalanadigan elektron o'quv tizimlari yordamida talabalar uchun bilim olish uchun keng imkoniyatlar yaratishni o'z ichiga oladi.*

Kalit so'zlar*: SI – sun'iy intellekt, AT-axborot texnologiyalari, LMS, eLearning, AKT.*

Introduction. In this article, you can find out that today artificial intelligence (AI) is used in the development of various areas, including the beginning of its application in the study of Education. It is expected that in the 21st century, in mastering the sciences from artificial intelligence, we will play an important role in reading and learning in enriching our knowledge, developing our methods of access to resources by forming electronic resources for teaching and teaching. With the development of technologies based on artificial intelligence, updating the methods in educational processes for the Independent Education of students in the field of education with modern technological devices and software tools for the use of modern technologies has become a demand of modern times today. Today I consider it necessary to conduct training using modern software tools from modern technologies, because other areas cannot be developed without developing the educational sphere. So today you will have visions of artificial intelligence in education and what good favorable conditions will be created and used for students to receive an independent education in the conditions of a modular credit system in improving the teaching and learning process from it.[1-8].

The rapidly growing field of artificial intelligence (AI) offers significant opportunities to transform the way science is taught, learnt and assessed by innovating lesson planning, providing learners with personalized feedback, automating assessment and offering unique, data-intensive experiences (Cooper, 2023; Zhai, 2023). Science educators have been at the forefront of integrating AI into educational research and practice (Shin & Shim, 2021; Guo et al., 2024) due to their collective interest in AI that dates back to the 1980s (Good, 1984, 1987; Good et al., 1986; Stewart & Atkin, 1982; Disessa, 1987). For instance, researchers have examined the automatic evaluation of students' written explanations and arguments (e.g. Ha et al., 2011; Moharreri et al., 2014) and student-drawn models (Zhai et al., 2022; Lee et al., 2023) using machine learning and computer vision algorithms. Recently, science education researchers have started using large language models (LLMs), such as BERT, ChatGPT (Bewersdorff et al., 2023; Wulff et al., 2023) and GPT-4 V (Lee & Zhai, forthcoming), to create personalised assessments and learning resources. They are also exploring how AI can be used to prepare pre-service teachers (Arantes, 2024) and in teaching more broadly (Jang & Choi, 2024). These collective efforts uphold the AI in science education initiative, which is pioneering the transformation of epistemic practice in science classrooms.[2-7].

As AI plays an increasingly important role in various aspects of science education, the National Association for Research in Science Teaching (NARST), the professional association of the science education community, has recently formalised its commitment to AI by establishing the Research in Artificial Intelligence-Involved Science Education (RAISE) Research Interest Group (RIG) in 2022. This is a significant milestone in the evolution of science education research intersecting with AI. Initially comprising 23 members, the group has grown rapidly to 130 members since its establishment. The 2024 NARST conference showcased the growing interest

among members in AI, featuring numerous presentations, including those in the RAISE RIG-sponsored poster session and 'Book Talk: Uses of Artificial Intelligence for STEM Education (Zhai & Krajcik, 2024), which attracted over 50 participants. In this context, there is a need for evidence-based reflection on the impact of AI on science education research. As a field, we are curious about the reasons behind the growing interest in and applications of AI among NARST members, and the aspects of AI being explored in research and its potential for science education. Ultimately, the field requires forward thinking and an understanding of current research for future studies. To address these issues, this study reviews the presentations, posters and workshops delivered at the recent 2024 NARST conference. The findings advance our understanding of the current state of science education research integrating AI, identify challenges in this rapidly evolving landscape and propose future research agendas to be collaboratively addressed by science educators worldwide. [1-6].

Methods:

Today, artificial intelligence is useful for studying all subjects. It is used extensively in education, for example.

In this article, we will discuss how students can be helped to master topics they do not understand by creating classrooms where they can use artificial intelligence for independent learning, based on our own experience. Of course, the development of the educational sphere is one of today's current topics, because we cannot develop other areas if the educational sphere does not develop. As pedagogical staff and teachers, we must constantly use modern information and IT technologies, even in times of change, because these modern methods produce results. I think it will be worthwhile to see one of the few IT technologies being used today: artificial intelligence.[2-5].

In higher education institutions, we must constantly develop the educational process by applying modern, innovative technologies and teaching methods to provide students with an education. Artificial intelligence technology is currently being used to develop all industries and is producing good results. If we use artificial intelligence to solve tasks such as developing the field of education, improving the quality of the educational process and increasing student interest in subjects, we will certainly achieve good results.

The term 'artificial intelligence in educational development' was coined by John McCarthy and Marvin Minsky in 1956 during their summer research project (COMEST, 2019; Haenlein & Kaplan, 2019).

To this day, several types of electronic learning platforms and mobile applications have been used for independent student education. Through such technologies, students have achieved good results, as I have witnessed during my time conducting scientific research.

So, what results can we achieve by using artificial intelligence in education?

Today, we will consider the results that can be achieved in an experiment on this topic.

If we use artificial intelligence to improve the educational process, students will be able to access a range of educational resources and create electronic courses, as well as upload large amounts of data to platforms to help them learn. In this process, there is direct contact between the students and the teachers. The student will master the assigned topics one by one at a time and in a location that is convenient for them. They will then send their completed assignments to the teacher, who will supervise and evaluate them. There will be online communication between the students and teachers throughout the process.[2-8]. One of the most interesting programmers for students of artificial intelligence at higher education institutions is the application of the credit modular system to the educational process at an AI training institution. This method has been created in accordance with independent education.

AI enables students to receive an independent education, teaching them to think for themselves and achieve results. However, students will not be able to complete tasks at the next level unless they master the full topic. Using this method to organize training will definitely provide us with the opportunity to train personnel with good, modern knowledge in the future. In order for students to receive independent training, it is advisable to use artificial intelligence when applying such methods. This involves creating opportunities to increase students' interest in science by making subjects interesting and relevant to them through modern, understandable

methods. Artificial intelligence (AI)-based educational tools are being used on a variety of electronic platforms to open up a wide range of opportunities for both students and teachers. These electronic platform visual aids not only improve results in the educational process, they also make it more interesting and accessible.

One of the most popular applications of AI in training is the use of virtual electron courses, which are one of the technologies offered by online electron training courses. These meaning-based artificial platforms have the ability to meet requirements by helping to find answers to questions, understand complex topics and independently change educational programmers.

This online, automated assessment system is based on artificial intelligence and is available on various platforms. Students can correctly assess the results of their completed assignments at short intervals. This means that communication and evaluation between students and teachers can be based on accurate statistics of the results achieved. Students have the opportunity to study independently on specific topics and demonstrate their understanding of the analysis processes using AI electron courses. During this time, teachers follow the educational topics assigned to them and help students master the subject by changing the system and using methods that students understand.

Students at higher education institutions are required to independently study and master 55% of subjects based on the plan, in addition to training. This is necessary because it means that they will have mastered almost half of the scientific knowledge required for their future careers, should they not study the subjects in depth. Today, under the conditions of the credit module system, students at all higher education institutions in Uzbekistan are obliged to independently study and master 55% of subjects based on the plan, in addition to training. This is necessary because it means that they will have mastered almost half of the subject matter. If future specialists do not study the subjects assigned to them in depth, they will not be able to become modern professionals or specialists in their chosen fields. Therefore, I believe that today's future teachers must be given the opportunity to apply a wide range of modern technologies to their studies. In order for students to master independent learning in training to become economists, programmers, doctors and other industry professionals, we must, of course, apply modern IT technology and make the most of it.

From artificial intelligence to improving the quality of education, Electron has been using software tools with different applications in our daily lives to achieve this. We can see this in mobile applications, Electron platforms, various social media and chatbots that serve customers.[2-6]. In order to improve the methodology for forming students' knowledge, skills and abilities in the process of independent learning, it is necessary to apply artificial intelligence technologies to students in order to assess their knowledge and provide them with the necessary methodological instructions. This will improve the methodology for applying electronic content, which can also be used if the student achieves good results. This will require the use of modern technical devices and software tools. Students can achieve good results through scientific research if they use some of the following artificial intelligence methods to improve the quality of their education and obtain an independent education. These methods include:

1. The student will be able to receive an independent education. They can be trained to compile information on lectures and practical classes. This information will be created by the teacher in advance on the electronic platform.

2. The student learns by reading the tasks assigned at the appointed time according to the plan. They feel responsible for fulfilling the assigned tasks on time, which fosters their punctuality and growing loyalty to their profession.

3. Students can complete their allocated tasks at any time and from any location.

4. The teacher can monitor the tasks performed by the student and provide methodological assistance in the event of any misunderstandings regarding the necessary tasks.

5. This method provides an opportunity to assess how much the student has mastered the subject. It gives the teacher a quick and accurate assessment of the student's work.

6. In addition to supervising students' timely completion of their independent studies, there is also an opportunity to encourage high-achieving students by giving them certificates at various levels.

7. he results obtained by students can be analyzed to identify shortcomings and problems in the educational process, and to develop opportunities and methods for improvement.

In order for students to receive an independent education, there are plenty of opportunities to use artificial intelligence and achieve good results. This provides a valuable opportunity to enhance the quality of education today.

In higher education institutions, students admitted to the first year come from schools or colleges of different nationalities and levels. Their level of knowledge and degree of mastery of the subject will also vary. Some students will quickly master topics, some will take longer, and some will achieve an average level. Teaching these students presents different challenges to teachers. If teachers use modern assessment techniques or software tools such as artificial intelligence technology, they can more easily determine the validity of students' work, which helps students to understand their level of achievement.

Since the first year, our university has been attended by people of different nationalities. Students from different countries come to study here, including those from India, Pakistan, Jordan, Korea, Russia, Turkmenistan, Tajikistan, China and more than eighteen other countries. Naturally, students' levels of knowledge vary depending on their level of learning.[2-8].

In such conditions, I apply IT technology directly to the training of international students, which has been allocated to me. In our medical university, future doctors are taught how to apply information technology in medicine from the first year of their education, and this forms part of my professional activities. Therefore, medical students should definitely receive knowledge on modern technologies from future doctors and be able to apply these technologies in their future professional activities. I support the use of modern technologies to help students master topics and evaluate them. I conduct my pedagogical activities using artificial intelligence technology so that students can receive independent education. I believe that this method will produce good results in the future.

Artificial intelligence can be used to assess students more accurately and objectively. It is also a very convenient system for assessing students from both local and foreign countries.

In addition, artificial intelligence can assess students more accurately than traditional exams, which are often based on multiple-choice questions. Various methods of assessment can be used through AI, such as evaluating students' knowledge of concepts, analyzing their speech and thought processes, and evaluating their data, among others. This online method is especially useful if foreign students cannot attend classes due to health issues or visa problems. They will be able to master the assigned subjects by reading. In such cases, using an artificial intelligence system to assess how much the student has learnt is considered a convenient assessment method. Teaching systems based on artificial intelligence provide students with educational materials and the opportunity to exchange ideas, analyses processes and discuss questions and tasks amongst themselves. Such situational questions and assignments encourage independent thinking, enabling students to analyses and complete them, even when faced with more challenging situations. By doing so, teachers encourage students to think more creatively and analyses interesting situations, since future professionals, especially teachers and doctors, will encounter various situations in which they will need to solve problems.

In the context of higher education, it is possible to enhance the learning experience of students through artificial intelligence by providing teachers with real-time feedback and analyzing how students interact with educational materials. AI-based chatbots can answer questions and provide feedback, freeing up teachers to focus on higher-level tasks. In addition, virtual and extended reality, based on artificial intelligence, can improve the quality of the educational process by providing electronic lessons created using simulation equipment or visualization software tools. This allows students to learn about biological processes in the human body, particularly in the field of medicine.

In higher education, artificial intelligence can be used to identify problems in students' independent learning. Teachers often do not have the opportunity to assess each student's ability to gain knowledge. In such situations, teachers can use software systems created by artificial intelligence to quickly determine each student's ability. This allows students to quickly solve problems encountered during the learning process and increase their knowledge.

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- Before students receive an independent education, it is possible to use artificial intelligence to determine their level of knowledge and provide them with appropriate topics, gradually increasing the level of difficulty.

- It is possible to determine whether students adapt to this system by observing them complete independent educational tasks in real time.

- This gives teachers the opportunity to identify areas in which students are struggling. In these areas, teachers provide students with the opportunity to carry out explanatory work using accessible methods.

In addition: Artificial intelligence can help teachers identify problems in the learning process that may otherwise go unnoticed. Data analysis systems can modify or analyse students if they determine that they will be able to influence their learning.

Conclusion

In a modular credit system at higher education institutions, students learn how to make the most of modern IT technology and software using new techniques. This involves applying information and communication technologies to teaching, creating wide opportunities for students to gain knowledge through electronic teaching systems using artificial intelligence to organize independent study. I believe that, in the future, we will achieve the training of modern personnel through high-quality education.

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