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FEATURES OF USING ARTIFICIAL INTELLIGENCE IN CHEMISTRY TEACHING

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Abstract:

The use of artificial intelligence in teaching chemistry in high schools makes it possible to radically change the educational process today. The science of chemistry is characterized by its complex theory, numerous formulas, reactions and experiments. As well as helping students delve deeper into the basics of science, this science also presents many challenges. Therefore, the use of modern technologies in the educational process, in particular artificial intelligence, is important in facilitating and improving the effectiveness of the learning process of students.

Keywords: chemistry, artificial intelligence, visual and interactive exercises, training programs, animations, modern technologies, visual laboratories.

The first priority of artificial intelligence in teaching chemistry is to ensure interactivity. In traditional classes, students often have difficulty mastering complex concepts based on theoretical knowledge. Artificial intelligence-enabled curricula, on the other hand, allow students to explore subjects in a practical way, visual and interactive. For example, showing the structure of molecules in 3D, explaining chemical reactions by animating, increases students ' interest in the subject and encourages them to participate more actively. Virtual laboratories are



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another important area of artificial intelligence. In chemistry, experiments are very important, which serve to strengthen theoretical knowledge. But to conduct experiments in practice, special equipment, safety rules and time are required. Artificial intelligence-based virtual labs, on the other hand, allow students to perform experiments in a safe and accessible environment. This not only eases the student's acquisition process, but also protects them from errors in the experimentation process. Artificial intelligence also makes it possible to adapt the educational process taking into account the individual characteristics of students. Each student's learning style, ability, and level of knowledge can vary. Artificial intelligence systems analyze the level of knowledge of students and provide them with adapted educational materials and assignments. This approach serves to identify and strengthen students' weaknesses, as well as making the learning process more efficient.[1]

Artificial intelligence is also a great auxiliary tool for teachers. Processes such as lesson planning, preparation of educational materials, assessment of the level of knowledge of students can be automated. This allows teachers to focus more time on an individual approach and overcoming student difficulties. Automated assessment systems provide a quick and accurate assessment of students' knowledge to help teachers analyze outcomes. In chemistry, memorization of complex formulas and reactions is required in many cases. Artificial intelligence can be used to create interactive tests, games, and other learning incentives for students. These tools serve to strengthen students' knowledge, make the process of repeating and mastering them interesting. Thus, students acquire their knowledge in a more efficient and robust form. With the help of artificial intelligence, students' success in the learning process is constantly monitored. This allows teachers to determine which subjects each student faces challenges. As a result, it will be possible to revise classes, give additional exercises or provide individual support if necessary. This approach is important in improving the quality of Education.[2]

There are also some problems related to the application of artificial intelligence to the educational process. These include the lack of infrastructure and skilled personnel needed to implement technology, and the difficulties of students and teachers in adapting to new technologies. In addition, excessive use of technology



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can weaken students' ability to think independently and approach creatively. Therefore, it is necessary to use artificial intelligence in the educational process in a balanced and purposeful way.[3]

Ethical issues should also not be overlooked in the use of artificial intelligence. It is important to protect the personal data of students, respect their individual characteristics in the learning process, ensure fair and transparent operation of systems. These aspects play a large role in improving the quality of the educational process and strengthening the confidence of students. In the future, artificial intelligence technologies are further developed and new opportunities are expected to open up in the teaching of chemistry. A new generation of virtual laboratories, intelligent learning systems, individual training programs and other advanced technologies make the educational process more efficient and interesting. This allows students to increase their interest in science, further strengthening their knowledge and skills.[4]

Conclusion:

In conclusion, artificial intelligence serves as an innovative and effective tool in teaching chemistry in high schools. It helps to make the learning process of students interactive, individual and interesting. At the same time, it is important to create the necessary conditions for the application of artificial intelligence to the educational process, training qualified personnel and balanced application of technologies. The work carried out in this direction will serve to radically improve the quality of education in the future.

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