
NEURAL NETWORKS IN EDUCATION: AN INNOVATIVE APPROACH TO LEARNING

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Abstract

Today, in the era of globalization, digitization, the creation of new technologies, environmental problems and other serious changes that affect almost all aspects of human life and work and pose new challenges and tasks to humanity, education is a part of modern society. It was felt that it is the main condition for its development and survival. The rapid development of science, the expansion of the volume of knowledge and information creates a demand for the formation of new educational methods focused on the personal and social needs of a person during the production period. Currently, the development of new technologies and their practical use have become one of the main factors of increasing the competitiveness of any country. The term "artificial intelligence" has become widespread in our way of life, which is closely connected with today's technologies. Artificial intelligence is a system or technology capable of imitating human behavior in the performance of certain tasks, gradually improving itself using the acquired information. In general, artificial intelligence is neither a format nor a function, but a process that includes data collection, analysis, etc.

The term "artificial intelligence" was coined by 1956. This summer, a conference on artificial intelligence was held at Dartmouth University in the USA. Scientists such as Claude Shannon (Bell Laboratories), Nathaniel Rochester (IBM), Herbert Simon (Carnegie University, Trenchard Moore (Princeton University), John McCarthy (Dartmouth University), Marvin Minsky (Harvard University) participated in it. American computer scientist John McCarthy (1927-2011) left a name in history as the author of the term "Artificial Intelligence".¹

Also, in 1997, the famous chess program "Deep Blue" was created, which defeated the world chess champion Garry Kasparov. During these years, the 6th generation computer project based on neural networks was being developed in Japan. After that, attention to artificial intelligence increased. From large companies to military institutions began to finance this sector. As a result, the number of new technologies has increased, competition has increased, and artificial intelligence tools have been perfected.

In order to increase the use of artificial intelligence technologies, to improve the system of digital data collection, storage and processing, a number of works are currently being carried out in our country to train qualified personnel in this field, to support scientific projects in this direction. . Even the "Digital Uzbekistan-2030" strategy approved by the decree of President Shavkat Mirziyoyev on October 6, 2020² of February 17, 2021 "Taking measures to improve the republic's position in the Government Artificial Intelligence Readiness Index"³ The publication of the decision (PQ-4996, Annex 1, paragraph 20) is also a proof that attention is being paid to these processes at the level of state policy. As a result

¹<https://www.tableau.com/data-insights/ai/history#:~:text=The%20idea%20of%20%E2%80%9Artificial%20intelligence,moved%20independently%20of%20human%20intervention.>

²<https://lex.uz/ru/docs/-5030957>

³<https://innovation.gov.uz/news/post-1102>

of these efforts, Uzbekistan began to rise year by year in the international ranking of the "Government Artificial Intelligence Readiness Index". Ranked 87th out of 189 countries with a score of 43.7 in the 2023 report of the index⁴.



Figure 1. Indicators of Uzbekistan in the "Government Artificial Intelligence Readiness Index". According to this index, Uzbekistan is ranked 7th among "Central and South Asian countries"⁵.

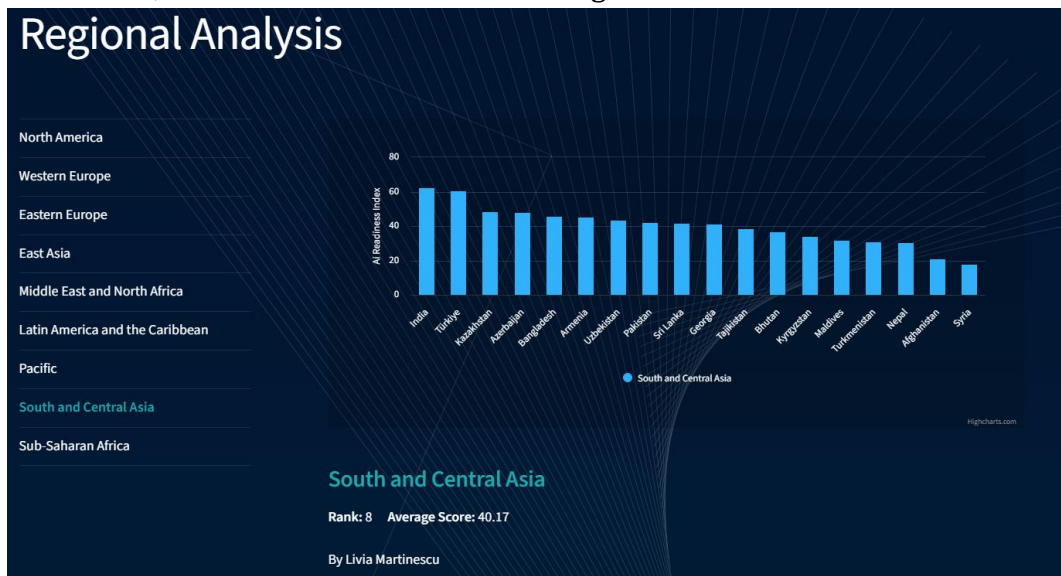


Figure 2. Ranking sequence of "Central and South Asian countries" in Government Artificial Intelligence Readiness Index.

In recent decades, artificial intelligence and neural networks, as part of the digitization process, have significantly changed the way we acquire knowledge and learn. These technologies provide new opportunities to personalize learning, automate assessments, and improve educational processes.

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⁵<https://oxfordinsights.com/ai-readiness/ai-readiness-index/#summary>

Today, the correct integration of artificial intelligence (Artificial Intelligence) in order to create advanced technologies and increase their efficiency is one of the serious issues facing humanity.

One of the main advantages of using neural networks in education is the ability to provide individualized learning to each student. Neural networks can analyze information about a student's mastery, learning style, and individual needs to suggest individualized learning programs and assignments that match students' knowledge levels and abilities. Some educational platforms use neural networks to create adaptive courses and materials. This allows students to learn subjects at their own pace and in the most efficient way. Flexible platforms can provide additional explanations, exercises, or tests to improve students' understanding of the material.

The use of artificial intelligence in the implementation of the educational process brings much relief for the teacher and the student. For example, SI can automatically grade homework assignments. This simplifies the evaluation process and allows for more objective assessment of student performance. In addition, neural networks can provide feedback to students, help them understand mistakes and improve their knowledge.

Artificial intelligence can also be used to optimize the management of educational systems. They can analyze information about curricula, timetables, available resources and other aspects of education to organize and improve the effectiveness of the learning process.

In addition, neural networks can be used to develop students' creativity and critical thinking. During the learning process, they help to discuss tasks, which helps to develop analytical, problem-solving and innovative thinking skills. Artificial intelligence can track the impact of lessons on individual students. Based on the results of the lesson or homework, he analyzes what he does not understand and where there are shortcomings. Through this, he provides feedback to teachers on how to improve their teaching or understand what are the shortcomings of textbooks and teaching materials. Artificial intelligence can also monitor students' attention levels and indicate which material is boring or too difficult.

Also, thanks to artificial intelligence, students can access an educational platform that can teach them not only what they need, but also areas that teachers do not know about. For example, AI learning platforms typically operate on data collected from multiple sources, carefully analyzed and cross-checked. It is very difficult from a human factor perspective for a teacher to be able to stay abreast of trends and events at the same level as an artificial intelligence.

The use of artificial intelligence in education is an innovative approach to teaching schoolchildren. They allow you to deliver personalized learning, tailor learning materials and evaluate performance more effectively. Neural networks also help to develop students' creativity and critical thinking skills and optimize the management of educational systems.

According to scientists, artificial intelligence should retain its identity. The system can show the strengths and weaknesses of the students and adjust the learning method and process accordingly. Artificial intelligence can recommend to the learner through games and special programs what to pay more attention to, what learning speed is suitable for him, where there are gaps and what activities he needs more. Intelligent algorithms can determine the best learning method for each student. They can help teachers identify the most gifted students, guide them in unique ways, and develop new ways for students to work together.

In the future, these technologies will continue to improve, which will create more opportunities for students to improve their education and improve the quality of education. The main conclusion is that learning new knowledge will become more individualized in the future.

References

1. <https://www.tableau.com/data-insights/ai/history#:~:text=The%20idea%20of%20%E2%80%9Artificial%20intelligence,moved%20independently%20of%20human%20intervention.>
2. <https://lex.uz/ru/docs/-5030957>
3. <https://innovation.gov.uz/news/post-1102>
4. [https://oxfordinsights.com/ai-readiness/ai-readiness-index/#summary.](https://oxfordinsights.com/ai-readiness/ai-readiness-index/#summary)