

NEURAL NETWORKS: APPLICATION IN THE EDUCATIONAL PROCESS

Karas E.D.

Belarusian State University of Informatics and Radioelectronics, Minsk, Republic of Belarus

Andreeva O.V. – Senior Lecturer at the Department of Foreign Languages

Annotation. The article discusses the active use of neural networks in the educational sphere in the context of the AI revolution. Opportunities and challenges of incorporating neural networks into learning process are described.

Keywords: artificial intelligence, higher education, students, educational process system, neural network.

Introduction. In the era of rapid technological development, humanity has reached the point when the artificial intelligence (AI) is becoming an integral part of our lives. Incorporating AI into the learning process opens up new horizons for personal learning and for people with disabilities as well. Using AI automates repetitive routine tasks and increases students' interest in learning through gamification.

When studying the approach to the integration of artificial intelligence into the educational process the following tasks take place:

- to analyze modern AI technologies that can be used in education;
- to study the existing experience of universities in implementing neural networks in learning process;
- to suggest options for the use of AI in educational system.

Artificial intelligence is not just a «toy for generating pictures». According to Gartner, by 2026, about 70% of IT products would be developed by means of AI [1]. For example, nowadays bots, actively used in business, allow communication with customers. Neural network-based applications are being released and tested by cybersecurity system algorithms [2]. Neural networks are able to search and organize data, generate new ideas and diverse content, that is why, their use in the field of higher education becomes more and more significant.

Main part. It would take a long time to list the advantages of artificial intelligence. Let's observe some tools which could be engaged in the development of educational process. Artificial intelligence, as it was mentioned above, plays an important role in improving the individual learning. Sometimes the lecturer's explanation of the material comprehensible to some students may be too hard for others to understand but they do not dare ask clarifying questions. In this case, neural networks can be useful for selecting content adaptable to individual learning pace. The virtual assistant writes an explanation in simple words and analyzes the theory using examples. Everyone can type the text in English and send it to the chatbot with the request to identify errors. It points out existing mistakes and helps to correct them [3]. There are many foreign students studying at universities in our country and neural networks would help them to adapt to the learning process faster.

Getting a good education might become a very big problem for people with disabilities. Speech-to-text tool Notta is a convenient way for hearing-impaired learners to perceive new material. [4].

Gamification is currently a popular way of learning. Among artificial intelligence tools developed to personalize exercises to each individual the most famous is the application Duolingo. Depending on its progress, application itself is able to offer more tasks on the least mastered topic.

Nowadays, AI tools are useful for teachers and lecturers as well. Neural networks reduce the time and effort of academic staff helping them to perform their pedagogical tasks. Some examples of

practical application of neural networks in educational activities are:

- creating tests. Neural networks are capable of generating a variety of test on any topic. For example, Google Gemini assists in quick getting a set of questions on the history of Belarus or mathematical problems for students having different level of knowledge;

- developing assignments and tasks. Artificial intelligence helps both to generate text and to formulate a detailed problem statement. For example, Chatbots such as ChatGPT or Yandex GPT successfully cope with the task of creating physics problems that deal with calculating the velocity of a meteorite;

- making presentations. When a presentation for a lecture should be quickly prepared, the GAMMA App service is useful. It creates slides corresponding to the topic of a lesson;

- visual content generation. To illustrate the material, neural networks, for example, GigaChat service from Sberbank, are able to create diagrams and drawings.

Despite the advantages, there is the risk that students will simply make a copy of the generated text without understanding and analyzing its content. It is important to explain that any neural network is an assistant, but not a performer of their assignment. That is why the great attention must be paid to the development of critical thinking, deep analysis of the obtained results, and discussing how students use AI in their work [5]. The 2023 study showed that about 50% of university students use neural networks for educational purposes. About 80% plan to use this AI tool in their future professional activities [3].

One of the famous examples is the experiment of Tyumen State University, where «AI-persons» replacing living teachers in some their duties were developed. The chatbot corresponding to a historical figure was created. Interesting characters, which students had the chance to converse with, were Robert Sapolsky, Steve Jobs, and even Joseph Stalin.

However, the result of this experiment was not particularly impressive. Students proved to interact with artificial intelligence rather poorly. They turned to AI, but much less than it was expected. And, the questions formulated by artificial intelligence were easily ignored by students [6].

Conclusion. In that way, the integration of artificial intelligence into the educational process opens up wide opportunities for personalizing learning, increases its effectiveness and optimizes the teachers' work. AI technology makes it possible to adapt educational materials to students' individual needs and improve independent learning.

It should be emphasized that neural networks ability to handle and generalize a huge amount of data can be used not only to create educational materials but to filter information and accelerate students and teachers' research work. In this regard, the use of AI requires a very serious approach to training students and teachers' skills needed to deal with this technology.

To sum up, artificial intelligence and neural networks in particular serve as the tools that support educational process but do not substitute for it. Their application in practice could considerably contribute to training qualified specialists who meet international standards.

References

1. Gartner. *Gartner Top 10 Strategic Technology Trends for 2024* [Electronic resource]. Mode of access: <https://www.gartner.com/en/articles/gartner-top-10-strategic-technology-trends-for-2024>. Date of access: 23.02.2025.
2. ITMO University. *Trends in Education* [Electronic resource]. Mode of access: <https://news.itmo.ru/ru/education/trend/news/13918/>. Date of access: 23.02.2025.
3. Sber Developers. *Education with AI* [Electronic resource]. Mode of access: <https://developers.sber.ru/help/gigachat-api/education-with-ai>. Date of access: 23.02.2025.
4. University of San Diego. *Artificial Intelligence in Education* [Electronic resource]. Mode of access: <https://onlinedegrees.sandiego.edu/artificial-intelligence-education/>. Date of access: 23.02.2025.
5. ITMO University. *Trends in Education* [Electronic resource]. Mode of access: <https://news.itmo.ru/ru/education/trend/news/13918/>. Date of access: 23.02.2025.
6. *Can AI Replace a University Teacher? Interview on the Results of a Series of Experiments* [Electronic resource]. Mode of access: <https://skillbox.ru/media/education/mozhet-li-ii-zamenit-prepodavatelya-v-vuze-intervyu-o-rezultatah-serii-eksperimentov/>. Date of access: 23.02.2025.