

FORMATION OF CREATIVE ACTIVITY IN STUDENTS THROUGH ARTIFICIAL INTELLIGENCE AND NEUROPEDAGOGICAL TEACHING

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Abstract. This article analyzes the role, opportunities, and future developments of artificial intelligence in the education system. It examines the use of artificial intelligence for personalizing the learning process, improving educational programs, implementing virtual assistants, and expanding the possibilities of distance education. Special attention is given to the role of artificial intelligence in democratizing global education, teacher training, and addressing ethical issues in education.

Keywords: artificial intelligence, global education, virtual assistant, ethics, neuropedagogy, creative activity.

Annotatsiya. Ushbu maqola ta'lim tizimida sun'iy intellektning o'rni, imkoniyatlari va kelajakdagi o'zgarishlarini tahlil qiladi. Unda sun'iy intellekt yordamida o'quv jarayonini shaxsiylashtirish, o'quv dasturlarini takomillashtirish, virtual yordamchilarni joriy etish hamda masofaviy ta'lim imkoniyatlarini kengaytirish masalalari ko'rib chiqiladi. Shuningdek, global ta'limni demokratiklashtirish, o'qituvchilarni tayyorlash hamda ta'limdagi etika bilan bog'liq muammolarni hal etishdagi sun'iy intellektning roli ham ta'kidlab o'tilgan.

Kalit so'zlar: Sun'iy intellekt, global ta'lim, virtual yordamchi, etika, **neyropedagogika**, ijodiy faollik.

Аннотация. В данной статье анализируются роль, возможности и перспективы развития искусственного интеллекта в системе образования. Рассматриваются вопросы персонализации учебного процесса с использованием технологий искусственного интеллекта, совершенствования образовательных программ, внедрения виртуальных помощников, а также расширения возможностей дистанционного обучения. Особое внимание уделяется роли искусственного интеллекта в демократизации глобального образования, подготовке педагогических кадров и решении этических проблем в сфере образования.

Ключевые слова: искусственный интеллект, глобальное образование, виртуальный помощник, этика, нейропедагогика, творческая активность.

INTRODUCTION

The education system requires students to be formed not only as individuals possessing knowledge, but also as creative, independently thinking personalities capable of making innovative decisions. From this point of view, the introduction of advanced pedagogical approaches and digital technologies into the educational process is one of the most urgent issues. In particular, artificial intelligence (AI) technologies and neuropedagogical approaches create opportunities for organizing effective education by taking into account the individual characteristics of students.

AI-based educational technologies serve to personalize the learning process, adapt curricula, introduce virtual assistants, and expand the opportunities of distance education. This creates

favorable conditions for developing students' independent learning, critical thinking, and creative approaches. In this process, the effective use of modern educational technologies by professors and teachers of higher education institutions is of great importance.

Large-scale reforms aimed at modernizing the education system are being implemented in the Republic of Uzbekistan. In particular, the Decree of the President of the Republic of Uzbekistan No. PF-5847 dated October 8, 2019, "On the Concept for the Development of the Higher Education System until 2030," the Resolution No. PQ-4199 dated February 20, 2019, "On the Establishment of Presidential Schools," and the Resolution No. PQ-4884 dated November 6, 2020, "On Measures to Further Improve the Education and Upbringing System," constitute the legal basis of reforms in this area.

The neuropedagogical approach is of particular importance in effectively organizing students' cognitive activity. This is because neuropedagogy is based on organizing the educational process in accordance with the mechanisms of human brain activity. This approach increases the effectiveness of teaching by taking into account psychophysiological factors such as attention, memory, thinking, and emotional state. In addition, a student's ability to generate new ideas, approach problems in unconventional ways, and apply knowledge in practical situations is directly related to their creative activity. A creatively active individual can independently defend their own views, promote innovative approaches, and strive for self-development. Therefore, organizing education on the basis of artificial intelligence and neuropedagogical approaches is considered an important factor in shaping students' creative activity.

LITERATURE REVIEW AND METHODS

In recent years, issues related to improving the educational process on the basis of artificial intelligence and neuropedagogy have been widely discussed in international and national scientific literature. In particular, UNESCO, in its 2021 report *Reimagining Our Futures Together*, emphasizes the role of digital technologies, including artificial intelligence, in transforming the education system. This source substantiates the necessity of person-centered education, equal opportunities, and the democratization of global education.

The OECD's Learning Compass 2030 concept, developed in 2023, highlights the importance of skills such as creative thinking, problem-solving, and independent decision-making in developing students' transformative competencies. This shows that the development of creative activity is one of the priority directions of modern education. Research conducted in the field of neuropedagogy also proves that aligning the educational process with the functioning of the human brain increases the effectiveness of learners' knowledge acquisition. Johnson (2020) emphasizes the importance of emotional state, motivation, and individual approach in the learning process.

Among local researchers, Mukhammadiyev (2021) and Safarova (2022) discuss the role of the axiological approach and value system in the educational process and emphasize the importance of innovative pedagogical technologies in personal development. Turgunov (2023) shows that creative approaches and modern methods play an important role in developing the competencies of future teachers. In addition, the Key Competence Framework developed by the European Commission in 2022 also recognizes creativity, critical thinking, and digital literacy as key competencies. This further increases the relevance of artificial intelligence and neuropedagogical approaches in modern education.

In this study, a comprehensive methodological approach was applied to investigate the process of forming students' creative activity on the basis of artificial intelligence and neuropedagogical approaches.

The theoretical basis of the research is formed by modern scientific views in the fields of pedagogy, psychology, and neuroscience. The following methods were used during the study:

Theoretical analysis method was used to study and summarize how the concepts of artificial intelligence, neuropedagogy, and creative activity are presented in scientific sources.

Comparative analysis method was used to clarify the effectiveness of AI-based approaches by comparing them with traditional teaching methods.

Pedagogical observation was used to observe students' activity, independent thinking, and creative approaches in the real educational process.

Questionnaire and interview methods were used to determine the level of students' use of artificial intelligence tools and their influence on the educational process.

Experimental method was used to identify changes in the level of students' creative activity through the introduction of AI-based educational elements.

The study applied qualitative and quantitative approaches in an integrated manner, and the obtained results were analyzed systematically. In addition, students' independent thinking, problem-solving ability, level of generating new ideas, and reflective activity were identified as the main criteria for assessing their creative activity.

RESULTS AND DISCUSSION

During the research process, the impact of the educational process organized on the basis of artificial intelligence and neuropedagogical approaches on students' creative activity was studied comprehensively. As a result of pedagogical observations and experimental work, significant positive changes were observed in students' learning activities.

In particular, it was found that the use of artificial intelligence-based educational tools contributed to improving students' mastery of learning materials, developing their independent learning skills, and forming individual learning trajectories. In classes organized on the basis of the neuropedagogical approach, improvements were observed in students' concentration, effective retention of information, and ability to apply acquired knowledge in practical activities. In particular, lessons organized with consideration of the emotional learning environment helped form positive motivation among students and activated their creative thinking.

The analysis of experimental results showed that the integration of artificial intelligence and neuropedagogical approaches led to an increase in the following indicators among students:

- ability to solve problems independently;
- level of generating new ideas;
- critical and creative thinking skills;
- reflective analysis skills.

Compared with traditional teaching methods, the research results showed that the level of creative activity was higher in the groups where innovative approaches were used. This once again confirms the effectiveness of modern educational technologies.

The introduction of artificial intelligence technologies into education not only optimizes the learning process, but also has a positive impact on students' personal development. However, this process also involves methodological, technical, and ethical challenges related to the use of technologies, and addressing these issues is important for further improving the quality of education.

At the same time, the practical implementation of the neuropedagogical approach requires teachers to have special training, psychological knowledge, and sufficiently developed innovative competencies. Otherwise, the effectiveness of this approach may not produce the expected results. The results of the conducted research scientifically substantiate that the educational process organized on the basis of artificial intelligence and neuropedagogical approaches is an effective means of developing students' creative activity.

CONCLUSION

In brief, artificial intelligence and neuropedagogical teaching approaches are effective means of forming creative activity in the personality and social development of future teachers, that is, students. Through the systematic introduction of such technologies into the educational process, it is possible to develop students' intellectual and creative potential. As a result, the training of competitive specialists with innovative thinking can be achieved. Therefore, the consistent implementation of these approaches in higher education institutions should be considered one of the priority directions for improving the quality of education.

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