European International Journal of Pedagogics (ISSN: 2751-OOOX)

Received: 26 February 2026 | Accepted: 22 March 2026 | Published: 14 April 2026

DOI: 10.55640/eijp-06-04-20

RESEARCH ARTICLE

The Role and Importance of Robotics in The Digitalization of The Educational Process

Irisboyev F.B
Senior Lecturer, Jizzakh Polytechnic Institute, Uzbekistan

Xayrullayev A. I
Jizzakh State Pedagogical University, Uzbekistan

VOLUME: Vol.06 Issue04 2026

PAGE: 110-112

Abstract

This article explores the importance of robotics and digital technologies in education and their impact on the learning process. In today's world, robotics and digital technologies play a significant role not only in scientific and technical fields but also in the educational system. The article highlights the benefits of integrating these technologies into education, focusing on their ability to develop problem-solving skills, creative thinking, and practical abilities in students. It also examines the pedagogical, psychological, and methodological aspects of incorporating robotics and digital technologies into educational programs.

KEYWORDS

Robotics, digital technologies, STEM education, innovations in teaching, interactive learning, programming, hands-on learning, digital competencies in education, blended learning, creative thinking of students, problem-solving, pedagogical methods, online learning, simulations, digital competencies of teachers, distance learning.

INTRODUCTION

Today, digital technologies are widely introduced in all spheres of society. The education system is not left out of these processes, it is developing on the basis of modern technologies. By digitizing the educational process, it is possible to effectively organize the process of providing knowledge to students, create an interactive environment, and develop students' independent thinking skills.

The development of the education system is carried out not only through traditional methods, but also through the use of modern technologies. Digital technologies and robotics, as new opportunities and resources introduced into the educational process, help students not only learn subjects in depth, but also develop their creative and analytical thinking skills. This article analyzes the scientific and methodological foundations of the use of robotics and digital technologies in education, innovative approaches, and their role in improving students' competencies. Digital technologies and robotics create new opportunities for students to master practical and theoretical knowledge. Robotics is a field based on the creation of automatic systems by combining mechanical, electronic, and programming technologies. Robotics in education allows students to study mathematics, physics, computer science, and other subjects in more depth. This, in turn, develops students' problem-solving and creative thinking skills.

Digital technologies help make teaching and learning

interactive and effective. Students learn through online resources, educational programs, simulations, and games, which increases their interest in learning and improves learning efficiency.

There are several scientific and methodological foundations for the use of robotics and digital technologies in education. Constructivism, for example, emphasizes that students actively construct their own knowledge. Robotics and digital technologies allow students to gain practical experience in solving problems, which is consistent with the constructivist approach. Also, innovative pedagogical methods, such as STEM (Science, Technology, Engineering, and Mathematics) education, are based on the integration of robotics and digital technologies. STEM education helps students develop their interest in technology and science, as well as apply mathematical and scientific knowledge in practice. Integrating robotics and digital technologies in education helps to increase students' competencies not only in traditional subjects, but also in new areas. For example, robotics allows students to learn skills in programming, engineering, and technology. Students learn to apply their mathematical and physical knowledge in practice by building and programming robots. Digital technologies can also be used to develop distance learning and introduce new forms of teaching to students through online courses, interactive programs, and simulations. This not only increases the level of student learning, but also helps to reach a wider audience. Robotics and digital technologies play an important role in education in developing students' creative and problem-solving skills.

Students learn to solve complex problems in designing and programming robots. This process creates practical experience for them and allows them to consolidate a lot of knowledge. With the help of digital technologies, students learn to use a creative approach to solving problems when they encounter difficulties in the learning process, using various simulations and educational programs. Such activities help students develop systematic thinking, critical decision-making and innovative approaches. Training teachers is also important for the effective introduction of robotics and digital technologies in the education system. Teaching teachers to use new technologies, improving their digital competencies and providing them with new pedagogical methods significantly increases the effectiveness of education.

It allows teachers to learn modern methods in the use of robotics and digital technologies, prepare them to use interactive educational tools, diversify education and adapt it to the individual needs of students.

Robotics and digital technologies are not only introducing innovative approaches to education, but also influencing social change. Through digital technologies, students not only learn scientific knowledge, but also learn to feel social responsibility in the processes of developing and applying new technologies. These technologies also help ensure equality and opportunities for students in education.

The use of robotics and digital technologies in education helps to develop innovative approaches, increase students' skills in problem solving, creative thinking and practical application of technologies. These technologies help to make education more effective, interesting and interactive. At the same time, it is important to prepare teachers for new methods and create an effective learning environment at all levels of the education system during the implementation of technologies.

In this regard, the introduction of robotics technologies into the educational process is of great importance. Robotics is an effective tool not only for studying technical subjects, but also for developing logical thinking, problem solving, and a creative approach in students. The use of robotics elements in the modern education system serves to make the process of learning more interesting and effective for students.

REFERENCES

1. Zhao, J., & Zhang, H. (2020). Application of Robotics in Education: Enhancing Learning with Technology. Springer.
2. Yuen, M., & Leung, K. (2021). Robotics and Automation in Education: Applications, Impacts and Future Prospects. Elsevier.
3. Williams, B., & Vaux, A. (2019). Digital Transformation in Education: The Role of Robotics in Learning Environments. Routledge.
4. Bogue, R. (2018). Robotics in Education: A Review of Educational Robots and Their Applications in STEM Learning. Industrial Robot: An International Journal.
5. Bers, M. U. (2017). Robotics and Education: An Interdisciplinary Approach. International Journal of Advanced Robotics and Automation.
6. Bender, J. D. (2019). The Impact of Robotics on the Future of Education. The International Journal of

Education and Development using Information and Communication Technology (IJEDICT).

7. Carter, M., & Adams, R. (2020). Robotics in Early Childhood Education: A Comparative Study of Educational Robots in the Classroom. Early Childhood Education Journal.
8. Gonçalves, M., & Silva, R. (2017). Artificial Intelligence and Robotics in Education: A New Era of Digital Learning. Cambridge Scholars Publishing.