TEACHING ROBOTICS TO SCHOOLCHILDREN IN THE DEVELOPMENT OF NEW UZBEKISTAN

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Abstract. This article analyzes the importance, prospects, and existing challenges of teaching robotics to schoolchildren in the development of New Uzbekistan. In the context of modern technological progress, robotics plays a crucial role in developing children's logical thinking, forming programming and engineering skills, enhancing creative thinking, and improving their ability to work with innovative technologies.

Keywords: robotics, school education, New Uzbekistan, technological education, programming, artificial intelligence, engineering, logical thinking

INTRODUCTION

With the development of digital technologies and artificial intelligence in the modern world, attention to the field of robotics is increasing. The experience of developed countries shows that learning robotics from an early age contributes to the development of children's logical thinking, problem-solving skills, and technological mindset.

Given the significant attention paid to education in the development of New Uzbekistan, it is essential to introduce specialized robotics lessons and extracurricular clubs. Robotics not only sparks students' interest in technology but also increases their engagement in STEM (Science, Technology, Engineering, Mathematics) subjects.

RESEARCH METHODOLOGY AND EMPIRICAL ANALYSIS

This study includes the following areas:

- Examination of international experience in teaching robotics in school education.

- Analysis of the system for teaching robotics to schoolchildren in Uzbekistan.

- Assessment of the impact, benefits, and future prospects of robotics education for students.

- Identification and evaluation of challenges in the widespread implementation of this subject in schools.

The primary goal of this article is to improve the system of teaching robotics in Uzbekistan, study international best practices, and outline future perspectives.

Robotics lessons help develop students' knowledge and skills in the following areas:

- Developing logical thinking – enhancing problem-solving abilities.

- Teaching programming basics – strengthening technical thinking.

- Encouraging creative thinking – generating and testing new ideas.

- Fostering teamwork skills – learning to work on projects collaboratively.

- Developing scientific research and experimentation skills.

The level of integration of robotics education in schools is presented in the following table:

Table 1. Development of Robotics Education in Schools in Uzbekistan

Robotics Fields	Implementation in Schools (%)	Student Interest Level (%)
Basic electronics and circuits	65%	80%
Programming and artificial intelligence	50%	75%
Automated systems	40%	70%

Mechatronics and mechanisms	45%	65%
3D modeling and design	35%	60%
Sensor technologies	30%	55%

As seen in the table, students have a high level of interest in robotics; however, this subject has not been fully introduced in all schools.

ADVANTAGES AND CHALLENGES OF TEACHING ROBOTICS TO SCHOOLCHILDREN

Teaching robotics to schoolchildren has several advantages:

- Stimulates interest in technology.

- Provides hands-on application of programming and engineering knowledge.

- Increases the likelihood of students choosing technological careers in the future.

- Develops creativity and independent thinking.

However, there are also several challenges in implementing robotics education:

- Lack of robotics laboratories in many schools.

- Insufficient qualifications of teachers.

- Limited time allocated in the curriculum for this subject.

- Limited availability of software and technical resources.

- Insufficient financial resources.

The following table presents an analysis of the advantages and challenges of robotics education:

Table 2. Analysis of Advantages and Challenges of Robotics Education

Advantages	Challenges and Barriers
Develops logical thinking in schoolchildren	Lack of necessary equipment and laboratories in all schools
Forms programming and engineering skills	Need to improve teacher qualifications
Provides essential knowledge for future careers	Insufficient time allocated for robotics lessons
Enhances creative thinking and problem-solving skills	Shortage of educational materials for teaching programming and technical knowledge
Increases interest in technological innovations	Limited financial resources

CONCLUSION AND DISCUSSION

Robotics is an integral part of modern technological education that helps students analyze problems, develop algorithmic thinking, and apply creative approaches.

To ensure the successful implementation of robotics education, the following recommendations should be followed:

- Establish robotics laboratories in schools and equip them with modern technologies.

- Study international best practices and introduce modern pedagogical approaches.

- Expand the integration of robotics education to contribute to the technological development of New Uzbekistan.

REFERENCES

1. Papert, S. (2010). Children, Computers, and Thinking: The Theory of Constructivist Learning. New York: Basic Books.

2. Resnick, M. (2017). Creative Learning: Innovating Education through Programming and Robotics. Boston: MIT Press.

3. Bers, M. U. (2018). Coding and Robotics: Innovative Education for Preschool and Elementary Students. Cambridge: Cambridge University Press.

4. Kazakoff, E. R. (2015). The Role of Robotics in STEM Education: Theory and Practice. London: Routledge.

5. Bryson, J. J. (2021). Artificial Intelligence and Robotics: Innovative Technologies in Future Education. Oxford: Oxford University Press.