



STEPS INTO CREATING A METHODOLOGICAL MANUAL FOR FORMATION OF THE BASIC CONCEPTS OF COMPUTER SCIENCE IN CHILDREN OF PRIMARY SCHOOL AGE: "COMPUTER SCIENCE IN MY MIND"

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Abstract.

The particular objectives and subject matter of computer science education in Uzbekistan's elementary schools may now be determined in two ways:

1. Fundamental instruction in the use of information technology tools.

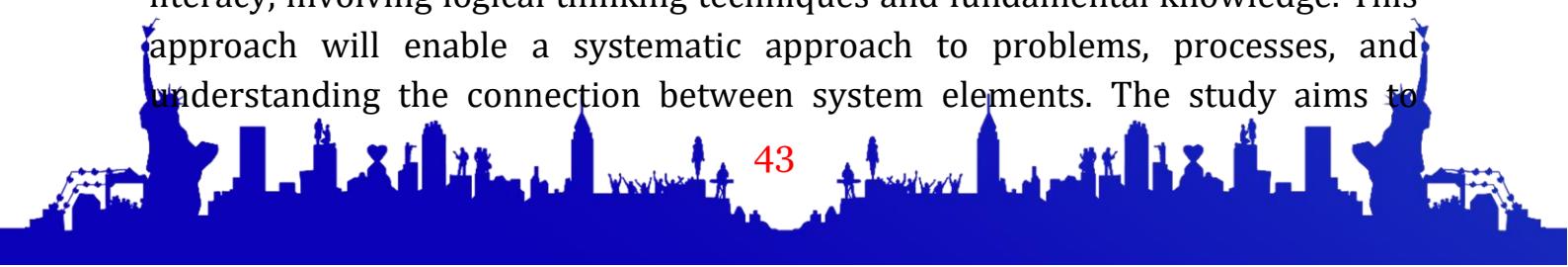
2. The growth of intellectual abilities and creativity that define a person's media literacy in the information age.

Our research's challenge is to figure out how to foster students' creativity while teaching computer science. Many works identify and explore issues related to basic computer science knowledge, as demonstrated by the findings of numerous psychological and educational studies. However, when it comes to thinking skills, such as the capacity to use novel techniques and tools and come up with non-standard solutions to problems, thinking skills remain at the second level.

Primary school-aged students nowadays are already familiar with information technology and various devices, which simplifies the answer to the question "What should be taught?" but also complicates the issue "How will I teach?" because traditional teaching approaches are ineffective for teaching today's youth. For these reasons, we are investigating many approaches, developing new ones, and inventing educational technology.

Key words: primary school, creativity, educational technology, information technology, methodology

Teaching computer science to primary school students is a crucial aspect of preparing students for the information society. This research aims to develop a methodology that focuses on the development of information creativity and literacy, involving logical thinking techniques and fundamental knowledge. This approach will enable a systematic approach to problems, processes, and understanding the connection between system elements. The study aims to





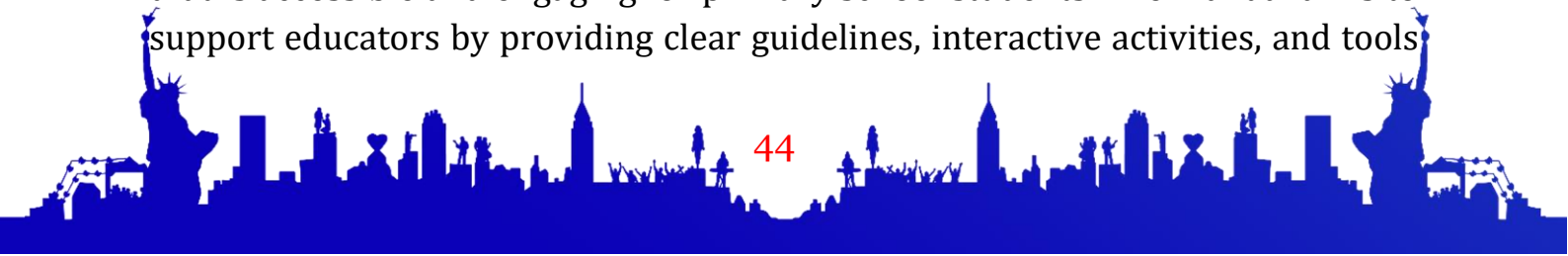
activate the educational process when teaching other subjects, focusing on the development of students' creativity to achieve educational goals. The object-information approach should be chosen as the basis for selecting content, prioritizing the development of creative components in students' thinking and techniques. This includes analysis, decomposition, identification of hierarchical structures, generalizations, and recording the results of logical operations in the form of diagrams, tables, and structured text. This will contribute to the development of students' information literacy and contribute to the overall learning process.

The study will be conducted with the following tasks in line with its intended purpose.

- Analysis of foreign sources to determine learning objectives and select content.
- Analysis of pedagogical and psychological concepts for developing students' creativity.
- Development of a concept for teaching computer science using an object-information approach.
- Development of a methodology for teaching computer science to first-grade students of primary school.
- Creation of a training kit "Computer Science in My Head" with textbooks with QR codes.
- Conducting a pedagogical experiment to test the possibility of using the methodology for developing information literacy in primary school students.

The integration of computer science education into primary schools is an essential step in preparing children for the digital future. The manual, titled "Computer Science in My Mind," emphasizes creative and engaging teaching approaches that align with the cognitive development of young learners. The work draws upon recent studies, international practices, and educational theories to outline a structured framework for building computational thinking and digital literacy in primary school students.

The importance of introducing computer science education at the primary level cannot be overstated. In today's world, where technology permeates every aspect of life, fostering computational thinking and problem-solving skills in young learners is crucial. This thesis investigates how a methodical manual can address these needs by presenting abstract computer science topics in a manner that is accessible and engaging for primary school students. The manual aims to support educators by providing clear guidelines, interactive activities, and tools





for teaching key concepts such as algorithms, data representation, and logical reasoning.

The creation of the manual involves several steps:

- **Content Selection:** Identifying essential computer science topics relevant to primary education.
- **Pedagogical Strategies:** Designing activities based on theories like Vygotsky's social constructivism and Papert's constructionism.
- **Integration of Technology:** Incorporating tools like coding games and interactive apps to enhance learning.
- **Validation:** Testing the manual in pilot classrooms and refining it based on feedback from educators and students.

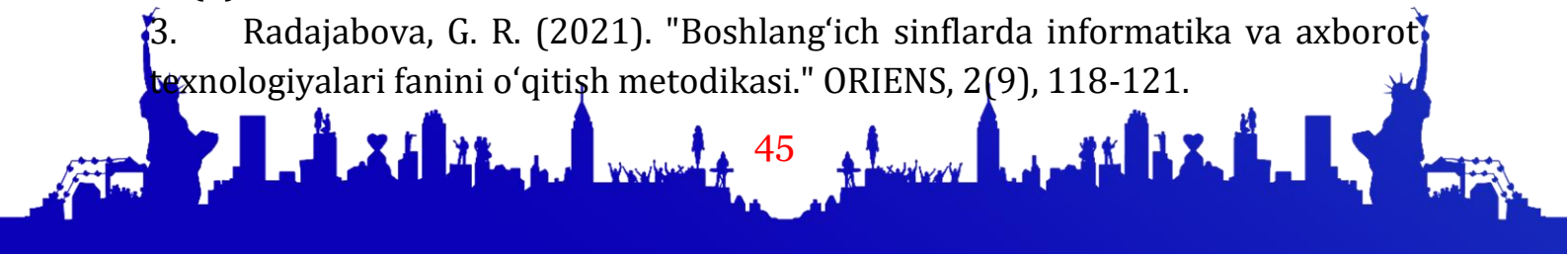
Developing computational thinking at an early age equips students with lifelong skills that transcend traditional subject boundaries. The proposed manual aims to address common challenges, such as the abstract nature of computer science and varying levels of technological infrastructure in schools. By using age-appropriate methods, the manual bridges the gap between students' cognitive abilities and the technical demands of computer science.

The gamification and visual storytelling techniques proposed in the manual have been shown to increase engagement and comprehension, as demonstrated in studies by Smith & Morgan (2023). Furthermore, García & Ho (2021) emphasize that educational technology significantly enhances creative learning experiences, supporting the integration of tools like Scratch and Blockly into the manual.

"Computer Science in My Mind" represents a significant step forward in democratizing computer science education for primary school children. By aligning pedagogical practices with developmental needs and leveraging modern educational tools, the manual lays a solid foundation for digital literacy and innovation. This work contributes to the global effort of equipping the next generation with the skills needed to thrive in an increasingly digital world.

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