

DEVELOPING CREATIVE POTENTIAL IN PRESCHOOL CHILDREN THROUGH STEAM TECHNOLOGIES IN THE EDUCATIONAL PROCESS

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Abstract

This article examines the theoretical and practical significance of STEAM technology in fostering creativity among preschool children. The study substantiates key pedagogical principles for the development of creativity, including centralization, reflexivity, effectiveness, and an integrative approach. It also analyzes the potential of STEAM-based education to enhance children's creative thinking, problem-solving skills, and engineering mindset.

Keywords: STEAM technology, creativity, preschool education, creative thinking, integration, competencies, pedagogical principles, innovative approach

Introduction. In developed countries such as the United States, Germany, Finland, Japan, South Korea, and Russia, particular attention is paid to scientific and pedagogical research aimed at developing creativity in preschool children through STEAM education. At the UNESCO International Congress (2015), preschool education was recognized as a crucial stage in shaping a well-rounded individual, facilitating socialization and adaptation to a rapidly changing world.

In Japan, for example, the development of creativity in preschool children is implemented through the concept of "Kokoro" education, which emphasizes not only knowledge and skills but also character formation. This approach integrates moral development, empathy, aesthetic sensitivity, self-regulation, and environmental awareness into the educational process.

Research conducted by national scholars such as Z.M. Ashurova, R.X. Bultakova, Sh.R. Turdiyev, and Yu. Maxmutazimova highlights the importance of STEAM approaches in developing competencies among preschool children. International researchers, including S.R. Singer, A.R. Pudyaningtyas, M. Kerker, G. Yakman, N. DeJarnette, and R.R. Bernstein, have also contributed significantly to the application of STEAM education across various domains.

Creativity is inherently linked to the psychological characteristics of the child and develops through the interaction of intellect, intuition, and logical thinking.

Main Part

Challenges in Preschool Education

Modern educational systems require educators to adopt innovative approaches. However, many preschool institutions still rely on traditional teaching methods, which often fail to meet contemporary societal demands. Such approaches may reduce children's motivation to learn and hinder their creative development.

Traditional teaching is typically linear and structured, limiting opportunities for self-development. In contrast, modern pedagogy emphasizes fostering creativity and holistic personality development. According to the "Ilk qadam" state curriculum, it is essential to provide children with non-standard tasks that encourage creative engagement in everyday life.

Role of STEAM Technology

STEAM education integrates five domains—Science, Technology, Engineering, Art, and Mathematics—into a unified learning system. Unlike traditional subject-based instruction, STEAM promotes interdisciplinary learning and encourages children to think critically, explore, and experiment.

Through STEAM activities, children develop:

- creative and divergent thinking;
- problem-solving skills;
- engineering and design thinking;

- the ability to generate multiple solutions to a problem.

Preschool children are naturally curious and inclined toward exploration. They are eager to understand how things work and actively engage in experiments and practical activities. Therefore, STEAM-based learning provides an ideal framework for nurturing their creativity.

Pedagogical Principles of Creativity Development

The development of creativity in preschool children through STEAM technologies is based on several key pedagogical principles:

- **Centralization Principle:** Focuses on designing learning activities aligned with educational goals, selecting appropriate methods and tools, and organizing effective instructional processes.
- **Reflexivity Principle:** Requires continuous adaptation of the educational process based on learners' needs and capabilities.
- **Effectiveness Principle:** Ensures achieving optimal results with minimal time and effort through efficient educational conditions.
- **Multifactorial Principle:** Considers various factors such as material resources, teacher qualifications, psychological environment, and students' intellectual potential.
- **Adaptability Principle:** Emphasizes the application of acquired knowledge in real-life contexts and supports social adaptation.
- **Naturalness and Socialization Principle:** Highlights the importance of integrating learning with social experiences and natural developmental processes.

Creativity fundamentally involves generating original ideas, solving problems in unconventional ways, and producing innovative outcomes. Its development significantly enhances school readiness and self-expression in children.

Creative Activity and Learning Outcomes. The creation of creative products depends largely on the individual's personality and intrinsic motivation. STEAM-based learning fosters such motivation by providing opportunities for exploration and self-expression.

Through STEAM activities, children not only acquire knowledge but also develop competencies in scientific and technological domains. They engage in hands-on experiences, experiments, and collaborative learning, which enhance their cognitive and creative abilities.

Conclusion. Creativity in preschool children develops progressively through structured educational stages. It manifests in children's ability to think broadly, communicate effectively, express emotions, and demonstrate creativity in various activities.

The implementation of STEAM technology leads to significant changes in children's cognitive processes and contributes to the development of personal qualities. Creative development occurs through communicative, practical, and игровая activities, particularly through play-based learning.

The integration of STEAM technologies into preschool education enhances children's readiness for school, supports their creative self-expression, and fosters essential competencies. By encouraging innovative thinking and problem-solving, STEAM education plays a vital role in preparing children for future challenges.

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