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"INTEGRATING POTTERY INTO STEAM-BASED EDUCATION THROUGH THE CREATION OF CLAY ROBOT TOYS"

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Abstract: This article highlights the experience of integrating the art of pottery with modern STEAM education. It proposes a methodology for developing technical thinking, creativity, and national craftsmanship skills in students through the creation of a mechanical robot model made of clay.

Keywords: Methodology, STEAM, clay, toy, education and upbringing, schools and preschool educational organizations, students, technology.

INTRODUCTION

In accordance with Decree No. PF-5712 of the President of the Republic of Uzbekistan dated April 29, 2019, fostering practical and creative skills based on interdisciplinary connections among students—within the framework of the STEAM approach being introduced into the education system—is a pressing task. From this perspective, the traditional process of making clay toys—serving as a medium that combines artistic, technological, and mathematical knowledge—can be an effective avenue for realizing this strategic objective. In line with established objectives, there is an active effort to research and develop effective methods for organizing educational processes and extracurricular activities—grounded in modern pedagogy and psychology—that foster students' creative and practical skills, encourage creative activity, and contribute to their harmonious, comprehensive, and holistic development.

According to UN reports, it is projected that by 2050, 75 percent of professions will be related to STEAM disciplines. It is believed that through education based on this system, students will evolve into professionals capable of solving future challenges and making new discoveries. First, let us address the question of what STEAM actually is: the term represents the initial letters of the English words "Science," "Technology," "Engineering," "Arts," and "Mathematics." STEAM was developed in the USA. Initially, subjects such as science, technology, engineering, and mathematics were integrated to form the STEM system; later, "Arts" was added, resulting in the fully developed STEAM model. Teachers believe that knowledge gained in these subjects—or more precisely, these disciplines—will help students develop into highly qualified professionals in the future. This is because it motivates students to acquire solid knowledge and immediately apply it in practice.

The term STEAM is essentially an expanded version of STEM—that is, STEM + ART = STEAM. STEM develops the functions of the left hemisphere of the brain, whereas ART develops the functions of the right hemisphere. While left-brain functions encompass analytical, inductive, deductive, and critical thinking, as well as language, reading, and writing skills, right-brain functions involve creativity, imagination, emotions, and more. This naturally leads to the question: why do we need the STEAM approach? In recent years, large-scale reforms have been implemented in Uzbekistan's education sector. Notably, a new Law "On Education" was adopted on September 23, 2020,

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comprising 11 chapters and 75 articles. Educational reforms have not been limited to this; the Cabinet of Ministers Resolution No. 187 of April 6, 2017—"On Approving State Educational Standards for General Secondary, Secondary Specialized, and Vocational Education"—also outlines measures aimed at restructuring the continuous education system in the Republic of Uzbekistan and organizing public education in line with global standards. Furthermore, on May 11, 2022, a Presidential Decree approved the "National Program for the Development of Public Education for 2022–2026." A National Curriculum, incorporating international best practices, has also been developed for Uzbekistan; this initiative is addressed in the Presidential Decree "On Measures to Develop the Spheres of Education, Upbringing, and Science During Uzbekistan's New Period of Development" (Decree No. PF-6108, dated November 6, 2020). One such change is the adoption of the STEAM approach in education. In accordance with the Decree of the President of the Republic of Uzbekistan No. PF-5712 dated April 29, 2019—"On Approving the Concept for the Development of the Public Education System of the Republic of Uzbekistan until 2030"—several tasks have been outlined. These include transitioning to an innovative educational process while addressing the need for a modern workforce; introducing ICT and new teaching methods; organizing lessons based on STEAM educational technology requirements; ensuring that the proportion of educators trained in STEAM subjects reaches 10% by 2023 and 50% by 2030; and establishing the knowledge base necessary for acquiring new professional competencies. From this perspective, the process of making clay toys in pottery can serve as a practical application of STEAM education.

Implementing STEAM-based education in schools and preschool institutions fosters a child's future ability to independently conduct innovative research. Regardless of the field, success requires knowledge, and STEAM technology can play a pivotal role in achieving this goal. This method enables the integration of theory and practice, allowing children to build upon their knowledge, apply it effectively, achieve independent success, and take pleasure in their own capabilities. STEAM is an innovative technology that can be implemented across all educational institutions. In activities organized based on the STEAM curriculum—whether in schools or preschools—the child's active participation is paramount. Within the STEAM framework, abstract ideas, concepts, or thoughts alone are insufficient for cognitive development; a child must apply everything practically and witness the results firsthand—or, more precisely, experience the process through action. This is because hands-on manipulation, a modern integrated environment (including its ICT components), and the accompanying experiments actively engage children in the learning process and heighten their interest. Integrating STEAM technology into activities such as making ceramic toys serves as an effective way to harmonize children's theoretical knowledge with practical experience. While working with clay, a child not only develops their artistic taste but also cultivates scientific thinking, an engineering mindset, and technical reasoning skills. For instance, when creating a toy, the child independently explores questions such as "How can I keep the shape stable?" or "What kind of movement mechanism can I add to make it spin or move?" This process fosters skills in problem-solving (Engineering), modeling (Technology), and inquiry (Science). Furthermore, by observing the physical properties of clay, the child gains firsthand understanding of natural phenomena—such as changes in the material's state, the hardening process, and its reaction with water—thereby facilitating the practical learning of scientific concepts. Artistic elements—such as decorative patterns, color harmony, and structural form—enrich the artistic (Art) component of the activity. Each child expresses their creative ideas through the finished product, which nurtures aesthetic thinking. Ultimately, the process

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of making toys allows the child to conduct scientific experiments, utilize technical tools, devise mechanical solutions to problems, apply creativity, and calculate precise measurements and proportions. Thus, the art of pottery—through the STEAM approach—becomes an invaluable tool for fostering creativity, engineering thinking, patience, and independent decision-making skills in children. It serves to develop STEAM competencies, offers practical solutions for the innovative educational objectives outlined in Presidential decrees, and enables the integration of national craftsmanship with modern education.

According to the Ministry of Preschool and School Education, STEAM subjects (which incorporate art alongside science, technology, engineering, and mathematics) are taught in Uzbekistan's Presidential Schools. These schools officially deliver STEAM education based on the international Cambridge curriculum.

For instance, information regarding the Presidential School in Tashkent notes that the curriculum includes natural and exact sciences, engineering, foreign languages, and information technology.

Moreover, the schools are equipped with the necessary technologies to support this approach, as evidenced by images of the Presidential Schools. I believe that incorporating pottery—specifically the creation of clay toys and various figures—into these practical activities enhances the STEAM program by fully realizing its "Arts" component, thereby fostering a generation with immense potential.

In conclusion, STEAM is an integrated teaching method combining science, technology, engineering, arts, and mathematics. Unlike traditional education, the STEAM approach ensures that knowledge is acquired through interconnected disciplines rather than in isolation. Children develop non-traditional thinking, problem-solving skills (finding multiple solutions), and creativity—competencies that will prove invaluable in their future endeavors. Furthermore, the inclusion of practical pottery sessions highlights the significant role that both STEAM methodologies and traditional national crafts—such as pottery—play in the lives of the younger generation today. Given the growing popularity, effectiveness, and educational advantages of STEAM technologies, it is recommended to incorporate the art of pottery into the educational process within the framework of STEAM technologies.

REFERENCES:

1. SH.M.Mirziyoyev 2018-yil 5-sentabrdagi «2018- 2021-yillarda O‘zbekiston Respublikasi Xalq ta’limi tizimini yanada takomillashtirish bo‘yicha chora-tadbirlar dasturi to‘g‘risidagi» gi PQ – 3931 – son Qarori.
2. Umumiy pedagogika [matn]. Darslik/ X. Ibraimov, M. Quronov -T.,”Sahhof”, 2023, 1-4 bet.
3. “Science and Education” Scientific Journal / www.openscience.uz July 2023 / Volume 4 Issue 7 Maktabgacha ta’limda STEAM ta’lim texnologiyasidan foydalanish zaruriyati Shaxnoza Rajabovna Ro‘ziyeva Buxoro viloyati, Vobkent tumani, 5-DMTT
4. https://lex.uz/docs/01.02.2024https://lex.uz/docs/-501300701.02.2024