GENDER ROLES IN STEM

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Annotation*: This article discusses the importance of introducing educational programs for preschool children to master basic knowledge of science, technology, engineering and mathematics (STEM knowledge). It is proven that teaching STEM knowledge to pre-school children gives them great potential for further development in primary and secondary school. When revealing the subject of STEM knowledge for preschoolers and the gender aspects of its successful teaching, it is concluded that, along with the preparation of such educational programs, it is necessary to develop the special knowledge of boys and girls.*
Key words: *STEM, preschool education, gender equality, gender differences in preschool development.*

In the modern world, over the past quarter century, a radical scientific and technological revolution has occurred due to the development of computer and information and communication technologies. This revolution led to a new format of human life, permeating both professional spheres and routine everyday life with new knowledge, skills and technologies. The changes affected everyone, but the younger generation turned out to be especially sensitive to them, as they are most actively involved in the development of new technologies that are still being developed. This also applies to preschoolers, which, due to the characteristics of preschool human development, provides opportunities for development in primary and secondary school, and in the future for further steps in the development of technology. It is argued that it is necessary to start learning knowledge on the concept of STEM from an early age, since children very easily intuitively absorb the innovations of the time. It is indicated that knowledge acquired in preschool age turns out to be an influential factor even in achieving success in higher education. That is why, in order to reasonably build a strategy for the development of the labor market, it is necessary to start with educational programs for preschoolers. In 2014, the US National Science Teachers Association recognized that preschoolers have excellent opportunities to learn and explain how the world works.

The institutionalization of integrated science, technology, engineering and mathematics (STEM) knowledge and skills and the revision and reframing of STEM curricula in early childhood education in Uzbekistan are just beginning. Many additional education projects have been successfully launched, but for now they mostly concern pre-school children and primary schoolchildren. Animated series that include STEM knowledge for preschool and primary school age are becoming widely known. However, there are no wide-ranging educational programs that integrate STEM knowledge that would be widely implemented in kindergartens. Traditionally considered successful

mathematical training of preschoolers, including mastering logic and counting, still remains outside of comprehension and connection to computer technologies in the modern world and does not show how the basics mastered can be applied by preschoolers in practice both in play and in fulfilling everyday needs children communicating online with relatives and friends. Or how IT technologies help in creating and distributing a video about a new craft or drawing of a preschooler.

STEM knowledge indirectly turns out to be significant for a preschooler's understanding and successful learning. For example, while eating, a situation may arise discussing food, the technologies of its production and preparation, on the one hand, and its role for human well-being, on the other. Examples can be found in the practices of walking, playing music and physical education, and, of course, children playing and using toys. Such observations and reasoning in kindergarten give children an understanding that STEM skills shape their lives, they are necessary for literally every modern person. A child's educational path and interests may vary greatly, but knowledge about technology can be useful anywhere. The narrowness of its application means that mathematics is more suitable for boys; it is they who become prize-winners of Olympiads and then show higher achievements in technical universities. The use of a gender approach to studying the current situation in preschool education is necessary in order to study in more detail how educational stereotypes are formed regarding the success of girls and boys in acquiring STEM skills.

There is an approach that recognizes that the development of a pre-school student is more successful when he immediately puts new knowledge into practice in a playful form, mastering the surrounding reality, or gains knowledge in the context of a practical problem situation, further confirms the importance of taking into account gender stereotypes and gender roles that are constructed in the process of developmental activities in kindergarten. Thus, the contexts of the problem situation should always take into account the already established interests of boys and girls and, in activities to create new interests, reform the gender segregation of children's interests. For example, boys and girls have different passions for role-playing professional games: boys play more as firefighters and car drivers, girls play as teachers, doctors, and veterinarians. Taking this into account, firstly, it is important for a teacher implementing a STEM educational program to create problem situations that reveal the need to use new technologies in professions that both boys and girls play. Secondly, the teacher's competence should also include the ability to expand children's role preferences: to get involved in the game and explain in the language of a preschooler.

A gender approach is used to study the conditions of mixed and separate education for boys and girls. One of the authors of works in this direction, V.E. Kagan, argues that education as a social institution should instill in children correct ideas about femininity and masculinity, which will help them better adapt to society and in the future choose the appropriate professional strategy. It is in preschool age (4-7 years) that children begin to form a gender identity, which assigns to them the norms of behavior and personal qualities characteristic of men and women. Therefore, separate education better instills gender-role norms in children and determines the vector of personality development as a man and as a woman. Also, in preschool age, children are more likely to internalize gender norms of behavior rather than personal qualities. As stated, the STEM field

involves the integration of four aspects. Mathematics is currently recognized as a basic discipline that allows the development of logic and abstract thinking. With its mastery, future schoolchildren have more opportunities to move to the virtual computerized world and the ability to switch from the virtual to the real world.

If mathematics and science are basic fundamental knowledge, then technology and engineering are their application, and here it is more worth talking about developing the ability to apply existing knowledge, try to apply the results in practice, see the implementation of scientific laws in real life, develop the design of material objects that help improve life. Educators argue that in order to successfully synthesize mathematics and engineering in the life of a preschooler, lessons must be increasingly informal, be integrated into the child's play activities, into his role-playing games, into creative interaction with adults, then he will be able to "grow in." A child in preschool age is not only a researcher, but also a born tester. From the first year of life, he tastes things, throws them, shakes them, picks them up, looks at toys and explores their properties. A great example of a material for developing engineering skills is LEGO. It allows you to study a variety of machine elements that perform various functions for its movement. However, not all boys, let alone girls, are interested in learning how machines work. To expand the opportunities for boys and girls to master STEM knowledge, it is necessary to develop this kind of educational didactic material.

Another important theme that could be synthetically built in here is the balance of professional and family life. Girls already at preschool age try to try on the role of their mother, playing "mother-daughter." The course of this game can include educational dialogues and projective role-playing situations in which modern technologies allow boys and girls to combine profession and parental responsibilities, aligning their gender roles.

As practice shows, STEM skills begin to develop at an early age, and therefore they should become part of educational programs for preschoolers and contribute to achieving the main goal of preschool education.

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