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Steam Technologies, a New Stage in the Development of Preschool Children

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Annatation. The implementation of the STEAM education model, which is an important component of many projects being implemented today, largely depends on the creation of a new subject-spatial environment of the education system as a whole, updating the content, software and methodological support, and material and technical base. STEAM technologies make it possible to introduce children to technical creativity, which contributes to the formation of the inclinations of engineering and technical thinking, and also gives children the opportunity to show initiative and independence, the ability to creative and cognitive actions.

Key words: STEAM-technologies, to introduce children to technical creativity, the formation of the inclinations of engineering and technical thinking, the manifestation of initiative and independence, the ability to creative and cognitive actions.

A modern teacher is, first of all, an erudite, energetic, creative person, possessing professional qualities and loving his work. He must be a mentor.

Changes over the past few decades are exciting, but at the same time, they make us worry. Every day new types of work and even entire professional fields appear, which is why modern teachers should think about whether the knowledge and skills they teach meet the needs of the time? Researchers are convinced that 65% of modern preschoolers will master professions that do not exist today. It will require young professionals who own the latest technology, understand the natural sciences and engineering.

What might interest our pupils, you ask?.. We answer… STEAM-technologies. They will allow teachers to raise a generation of successful researchers, inventors, scientists, technologists, artists and mathematicians.

A reasonable question arises, why exactly STEAM and exactly in kindergarten? Our preschoolers should be ready for school innovations, creating projects and the ability to implement them in reality. How to implement STEAM education in kindergarten?

STEAM is an educational approach that incorporates the arts into the more-familiar STEM model, which includes science, technology, engineering and mathematics. STEAM programs can include any of the visual or performing arts, such as dance, design, painting, photography and writing.

The focus has been on STEM fields and education for them since the late 20th century, when the ongoing shortage of technology workers began. Since that time, government agencies in many countries around the world have invested heavily in STEM education and its promotion. The emphasis on fostering STEM skills has inescapably led to decreased emphasis on other subjects in the arts and humanities, with the result that funding for them has dwindled and students have fewer arts-related options.

Reintegrating art and design into education has been demonstrated to increase the happiness and well-being of students. From a business and perspective, the major payoffs include better problem-solving skills and increased creativity and innovation. The integration of arts into STEM education and fields may also help encourage more participation by women in what have been male-dominated areas. Firstly, the creation of a mixed subject-spatial environment that will allow for design and experimental research activities, the creation of IT technology classrooms, a STEAM laboratory, and LEGO centers.

Secondly, STEAM integrates various activities of preschoolers that combine all five areas, and provides an opportunity to demonstrate results. After all, the main motto of the STEAM program is: “Minimum theory, maximum practice”.

What is the role of the educator? Only the innovative approach of teachers makes it possible to achieve high results through practical research activities.

What do you need to know about STEAM technology? There is one main thing you need to know about STEAM - it is not just a fashion in education, it is an investment in the future of children, where a child can master several professions, be sociable, creative, fluent in the audience and defend their projects.

The use of STEAM technologies in our work began with the acquisition and use of LEGO constructors, which, when organizing the educational process, make it possible to introduce children to technical creativity, which contributes to the formation of the inclinations of engineering and technical thinking, and also makes it possible for children to show initiative and independence, the ability to goal-setting and cognitive actions. Promotes the development of attention, memory, thinking, imagination, communication skills, the ability to communicate with peers, vocabulary enrichment, the formation of coherent speech.

In the process of mastering LEGO construction, which combines elements of play and experimentation, preschoolers learn the basics of modern robotics, which contributes to the development of technical creativity and the formation of scientific and technical orientation in children.

The implementation of the STEAM education model, which is an important component of many projects being implemented today, largely depends on the creation of a new subject-spatial environment of the education system as a whole, updating the content, software and methodological support, and material and technical base.

The STEAM education program in preschool education has several modules:

1. Didactic system of F. Frebel;
2. Experimenting with animate and inanimate nature;
3. LEGO construction;

4. Mathematical development;
5. Robotics;
6. Multi-studio "I create the world."

For my work, I chose "Experimenting with animate and inanimate nature."

Why did I choose this module, you ask? I answer: “Research activity is of great interest to children. An unquenchable thirst for new experiences, curiosity, a constant desire to independently seek new information about the world. Frequently asked questions: Why? Why? When? Experiments somehow remind children of magic tricks, they are unusual, they surprise.

The child's need for new impressions underlies the emergence and development of inexhaustible orienting research (search) activity aimed at understanding the world around. The more varied and intense the search activity, the more new information the child receives, the faster and more fully he develops.

What result did I want to get?

1. To develop children's interest in independent research, discoveries.
2. Develop observation, curiosity.
3. Develop cognitive processes: logical thinking, perception, voluntary attention, memory, fine motor skills, active speech and enrich vocabulary.
4. Enrich the subject-developing environment in the group.
5. To form self-confidence in children through the development of mental operations, creative prerequisites and, as a result, the development of personal growth and a sense of self-confidence and self-confidence in children.

Based on this, she determined the purpose of the work: the development of cognitive activity in children, curiosity and the formation of children's interest in the study of animate and inanimate nature through children's experimentation.

After diagnosing children by sections of ecology, the result showed that many children have "gaps" in knowledge. Not all children have a solid knowledge of the diversity of the world of living and inanimate nature.

As a result, I was given the following tasks:

Raise in children an interest in natural phenomena. To give elementary ideas about the properties of sand, water, stones, air.

To develop cognitive activity in children, voluntary attention, memory, speech, fine motor skills of hands and tactile-kinetic sensitivity.

Show the relationship between man and nature. To educate the culture of children's behavior in nature. Learn to take care of the natural environment.

The question arises - where to start?

Of course, the first thing is to create conditions for experimental activities.

After all, a properly equipped research laboratory, with its correct introduction into the

educational process, provides an opportunity to saturate kindergarten classes with experiments with animate and inanimate nature, arouse children's interest in experimental activities, and form the initial skills of conducting independent research.

I divided the materials that are in the corner of experimentation into sections: "Sand", "Water", "Air", "Stone". They are in a place accessible for free experimentation and in sufficient quantity.

The material in the corner of experimentation is designed for children, both of an average level of development, and for gifted children and children with a high level of development, in order to comply with the mini-max principle.

In the experimentation corner there are: both basic (various vessels made of various materials, different volumes and shapes; natural and waste material; etc.) and additional equipment (oilcloth aprons, towels, containers for bulk and small items.)

To successfully solve the tasks, I used the following principles of work:

- the principle of scientific character and accessibility of concepts;
- the principle of local history;
- the principle of natural conformity.

At the same time, educational technologies were used:

- ICT - technologies (there is an interactive whiteboard in the group);
- STEAM group space created;
- technology of research activity (technology provides the child with the opportunity to find answers to all his questions, allows him to feel like a researcher);

As part of my work, I have carried out:

1) experiences and experiments with children:

Experiences and experiments with water.

"What color is the water?";

"What does the water taste like?";

"What will happen to the water in the cold?";

"Sinking - not sinking";

"What dissolves in water?";

Experiments and experiments with air.

"What is air?";

"Games with a balloon and a straw";

"Where can air hide?";

"Is there air in the water?";

"Air in the aquarium";

"Air and Smell";

"Air tricks";

"Air pressure and wind".

Experiments with stones, sand.

"In the kingdom of stones";

"Collecting a collection of stones";

"Exploring the sand";

"Hourglass";

Experience "Weigh the sand";

"Introduction to clay";

"What is the soil made of?";

“Is there air and water in the soil?”;

2) In working with parents, the following were developed: consultation - children's experimentation in kindergarten and recommendations for organizing children's experimentation at home. A photo collage was made “We don’t get bored even at home - we set up experiments together!”

3) A file of experiments and experiments has been formed.

The results of the work on the formation of ecological consciousness in the process of experimenting with animate and inanimate nature, presented in this diagram, indicate a successful work.

As the Chinese proverb says: “Tell me and I will forget; show me and I will remember; let me try and I will understand.” Experimentation fully gives children the opportunity to independently look for a solution to the tasks assigned to them, try, experiment, make mistakes and get unexpected answers to their questions, because the satisfaction of curiosity should be combined with impatience, to find out what will happen in the next lesson, with an attempt to express their own assumptions and hypotheses.

As mentioned earlier, the STEAM education program has several modules. For my work, I chose "Mathematical Development". Why did I choose this particular module? No one will argue with the fact that every teacher should develop logical thinking in preschool children.

Working on the experience of the formation of logical thinking in preschoolers, I suggested that the use of didactic games in the development of logical thinking increases the effectiveness of the educational process. To do this, I conducted a study in a playful way, the purpose of which was:

- Study of the effectiveness of the development of logical thinking of preschoolers using didactic games, both in direct educational activities and in joint and independent activities.

I did control cuts. Based on these control sections, I made a diagnosis of children. The diagnostic results showed: with a high level - 0% (0 children), with an average level - 48%

(11 children), with a low level - 52% (12 children).

My observations have shown that the formation of these structures proceeds with great difficulty. Children do not have enough knowledge, do not know how to analyze.

In this regard, I have defined the purpose and objectives of my work.

Purpose: development of cognitive and logical abilities of children (personal development).

Tasks I have set for myself:

1. Teaching children operations: analysis - synthesis, comparison, ordering of actions, orientation in space.
2. Development in children: logical thinking, speech (the ability to reason, prove), arbitrariness of attention, cognitive interests, creative imagination.
3. Education: communication skills, the desire to overcome difficulties, self-confidence.

How to solve this problem? To solve the problem, I first of all created an appropriate developmental environment in the group, the Zanimatika center, which included a variety of didactic games - mathematical entertainment, taking into account the age characteristics of children.

To study the value:

- Logic puzzle "Big - small";

To study shape and color:

- Mosaic;
- Logic puzzle;
- Geometric lotto;
- Colored counting sticks;
- A set of geometric bodies.

For the study of space:

- Logic puzzle insert "Geometric shapes";

- "Geometric";
- Tangram.

To study time:

- Didactic game "What first and what then";
- Game "Didactic hours".

A card file of didactic games has also been formed. Work is underway with parents in the form of consultations and recommendations on organizing joint games at home for the development of logical and mathematical thinking.

Did I get positive results? Yes! Observing the play activities of children, I noted that

didactic games for the development of logic are of the greatest interest to children.

The results of the diagnostics confirmed the need for targeted pedagogical work to organize a system of game classes using didactic games aimed at the formation of logical and mathematical thinking.

The results of the diagnostics show that during my work, my experience contributed to an increase in the level of logical development of children.

As Sukhomlinsky wrote in his book “I Give My Heart to Children”, “There are thousands of tasks in the world around us. They were invented by the people, they live in folk art as riddle stories.” The ability to think logically, to draw conclusions without visual support, to compare judgment with certain rules is a necessary condition for the successful development of children in the future. To develop cognitive activity in children, voluntary attention, memory, speech, fine motor skills of hands and tactile-kinetic sensitivity.

Show the relationship between man and nature. To educate the culture of children's behavior in nature. Learn to take care of the natural environment.

The question arises - where to start?Of course, the first thing is to create conditions for experimental activities.

After all, a properly equipped research laboratory, with its correct introduction into the educational process, provides an opportunity to saturate kindergarten classes with experiments with animate and inanimate nature, arouse children's interest in experimental activities, and form the initial skills of conducting independent research.

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Thus, with the help of STEAM - technology, preschoolers delve into the logic of ongoing phenomena, understand their interconnection, study the world systematically and thereby develop curiosity, an engineering style of thinking, and the ability to get out of critical situations. At the same time, children learn the basics of management and self-presentation, which, in turn, provide a completely new level of child development.

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