

Creating an Innovative Environment for Teaching Children Visual Arts on the Basis of Steam-Technology in Preschool Education

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ABSTRACT: The article considers modern effective pedagogical technologies used in the work of preschool education. Substantiates the relevance of the use of modern innovative technologies in the activities of preschool education. List the most current modern innovative technologies used in the work of preschool education institutions. Concepts such as “innovative technology” and “pedagogical technology” will be considered. The essence of these technologies and the purpose of their application are explained. It is concluded that the need for effective use of these technologies in preschool education. Forms, methods, classifications of types of technologies used by kindergarten teachers are described.

Keywords: STEM, Science and mathematics, Pedagogical technology, Carousel, «Brownian motion», «Decision tree», «Aquarium», science skills.

Introduction

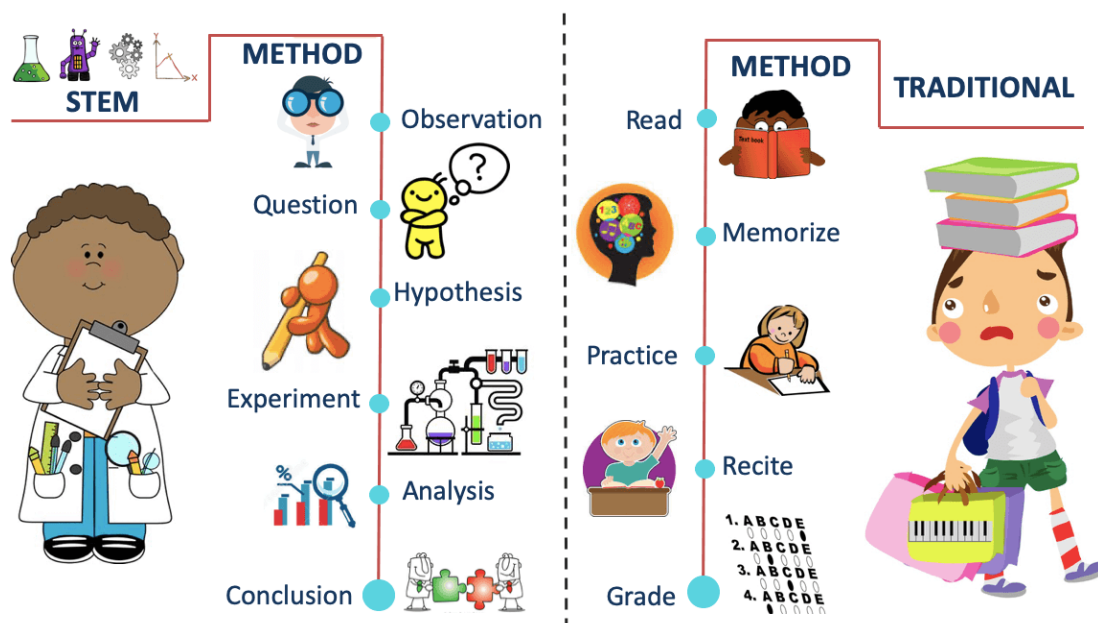
STEM is not an acronym for science, technology, engineering, and mathematics, but a teaching method that combines these topics.

This addresses concerns that disciplines or disciplines are often taught in isolation, when in fact they are all interrelated. This is a reciprocal disciplinary approach based on the study of manuals.

In today’s world, these areas are inseparable. Pick any item from your home or office and try to fit it in just about any of the root subjects. This is not possible because everything is integrated with each other.

Science and mathematics lead to the development of technology, which is then integrated with engineering to make it useful in our lives.

STEM encourages children to learn to experiment, to make mistakes, and to draw the right conclusions from their own experiences, rather than relying on the words of the textbook.



«Pedagogical technology» — this is the construction of teacher's work, which included in his action a certain order and expect to achieve the projected results.

The following criteria are the essence of educational technology:

- an unambiguous and strict definition of the learning objectives (why and for what);
- the selection and maintenance of the structure (that);
- optimal organization of the educational process (as);
- methods, techniques and means of teaching (through which);
- as well as keeping the required real skill level of the teacher (who);
- and objective methods of assessment of learning outcomes (is it).

The establishment of an additional education of children, in contrast to the school there are all conditions for children to share their individual characteristics and interests; teach all different, adjusting the content and methods of training depending on the level of mental development and specific features, capabilities and requirements of each child.

The condition for the effectiveness of any development of the curriculum in secondary education is a passion of the child's activities, which he chooses. Therefore, in the system of supplementary education curriculum is created by each student.

In further education there is no strict regulation of activity, but voluntary and humanistic relationships of children and adults, comfortable for creativity and personal development make it possible to introduce the practice of student-oriented technologies.

The purpose of student-centered learning technology is the maximum development (as opposed to the formation of pre-defined) individual cognitive abilities of the child through the use of existing him of life experience.

In accordance with this technology for each student to create individual education program, which, unlike the training is individual, based on the characteristics specific to the student, the flexibility to adapt to his or her abilities and development dynamics (for example, many teachers work individually with gifted children, children with disabilities) lay in its educational program.

In the student-centered learning technology center of the whole educational system is the individuality of the child's personality, therefore, methodical basis of this technology account for differentiation and individualization of education.

Personalization of education is a fundamental characteristic of an additional education of children. By virtue of its use in different organizational forms and nature of the various motivations of personality-oriented practice became his ancestral feature.

Individualization of learning technology (adaptive) — this training technique in which an individual approach and individual form of training is a priority.

The establishment of several options taking into account the individual features can be applied additional education of children and opportunities for students:

1. Acquisition of training groups of uniform composition (by gender, age, social status).
2. Intra- group differentiation for the organization of training at different levels when it is impossible to form a complete group on the direction.
3. Profile education, elementary and pre-professional training in groups of senior managers (seamstress, video art, etc.).

The main advantage of individual training is that it adapts the content, methods, forms, tempo training to the individual needs of each student, to monitor his progress in learning to make the necessary correction. This allows the student to work economically, to control their costs, which guarantees success in learning. At school, individual training applies limitedly. Group technologies require the organization of joint activities, communication, dialogue, mutual understanding, mutual support, intercorrection. Modern additional education level is characterized by that group technology widely used in its practice. There can be selected the following level of collective activities in groups:

Simultaneous work with the whole group;

Work in pairs;

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Group work on differentiation.

Peculiarities of group technology lies in the fact that the study group is divided into subgroups for addressing and carrying out specific tasks; the task is performed in such a way as to be visible the contribution of each student. Group members may vary depending on the purpose of the activity. During group work the teacher performs a variety of functions: controls, answers to the questions, regulates disputes, helps. Teaching has done through communication in dynamic groups, where each learns each. Work in pairs allows trainees to develop a removable structure of independence and communicability. Interactive learning technologies is an organization of the learning process in which the student can be in the collective, complementary, based on the interaction of all participants of the training of comprehension process.

Using the interactive learning models include simulations of life situations, the use of role-playing games, joint problem-solving. It eliminates the dominance of any member of the educational process, or any ideas. It teaches humane, democratic approach to the model.

The method «Carousel» it is formed two rings: inner and outer. The inner ring is the students sitting still, and the inner students change in every 30 seconds. Thus, they have time to say a few minutes a few topics and try to convince the correctness of the interlocutor.

Technology «Aquarium» is that some students act out the situation in the circle, and the rest observe and analyze.

«Brownian motion» presupposes the movement of students across the class to gather information on the proposed theme.

«Decision tree» — class is divided into 3 or 4 groups with the same number of students. Each group discusses and takes notes on his «tree» (a sheet of paper), and then the group is swapped and appends their own ideas to neighbors trees.

The meaning of interactive learning is that the learning process is organized in such a way that almost all trainees are involved in the learning process, they are able to understand and reflect on about what they know and think. Joint activity of students in the learning process, development of teaching material means that each individual brings their own special contribution; there is the exchange of knowledge, ideas and methods of activity. Moreover, it happens in an atmosphere of goodwill and mutual support, which allows not only obtaining new knowledge, but also develops the cognitive activity, it transfers into higher forms of cooperation and collaboration.

All the educational, developmental, up-bringing, social technologies used in the further education of children, are intended

- to awaken the activity of children;
- to arm them with optimal methods of business;
- to carry this activity to the creative process;
- to lean to independence, activity and communication of children.

New educational technology can radically restructure the learning process. Under the conditions of an additional education the child develops, participating in the games, cognitive, labor activity, so the purpose of the introduction of innovative technologies is to give children experience the joy of labor in teaching, awaken in their hearts the feeling of self-esteem, to solve the social problem of development of each student's abilities, including it in an active activities, bringing the presentation on the topic to study the formation of sustainable concepts and skills. Modern technologies in the work of institutions of additional education of children combined with everything valuable that has been accumulated in the domestic and foreign experience, family and folk pedagogy, they allow you to choose the most effective methods and techniques for organizing children's activities and create favorable conditions for their communication, activity and self-development.

Method

Studies on the implementation of elements of STEAM education are conducted in many countries: The United States, Australia, South Korea, Canada, Thailand, etc. The possibility of including the element "ART", used in the abbreviation STEAM, as shown by the study of experience in the implementation of STEAM-education, quite diverse, and they Expand as the students' progress through the basic levels of education.

For example, in kindergartens and junior classes, such an area of physical knowledge as acoustics can serve as an element linking STEM and STEAM. According to the researchers, acoustics is ideal for STEAM, since it is closely related to one of the areas of art - music. It is clear that this requires the pedagogical staff training, and there is such an

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experience of cooperation (training) Acoustics Research Group at Brigham Young University (BYU) with primary school teachers who subsequently successfully integrated art into teaching activities. A set of activities on increasing of younger schoolchildren's interest in physical phenomena can be integrated into the system of STEAM-education.

The need for an interdisciplinary approach in STEAM education (inter-, trans- and crossdisciplinary learning), implemented with the cooperation of subject teachers, the use of creativity in the work of secondary school teachers for the development of critical thinking of students is convincingly justified by the results of an international study where secondary schools Australia, the United States, Canada and Singapore took part.

Children are natural scientists. They try to figure out just how the world works by engaging in a series of steps called the scientific method. The scientific method includes observing, forming questions, making predictions, designing and carrying out experiments, and discussing. Even infants and toddlers are using a basic form of the scientific method (or performing little experiments) as they explore and discover the world around them! Children find patterns and build theories to explain what they see, and collect "data" to test those theories. A theory is like a guess or possible explanation for something. A toddler makes footprints after she walks through a puddle. She may form a theory based on her observation of her footprints, that the way she walks changes the size and shape of the prints. She then tests her theory by hopping on one foot or walking on her toes to see if her prints change. Like scientists, children learn from others. They watch what children and adults do and learn from trying to repeat what they've seen or by asking questions and seeing the results.

When we think of technology, cell phones and computers often come to mind. But the "T" in technology also stands for any type of man-made object. Technology includes simple tools such as pulleys, wheels, levers, scissors, and ramps. They support children's cognitive development, because as children play with these tools, they observe and learn from the underlying cause and effect. These simpler technologies allow children to understand how tools help us accomplish tasks. Children can see the cause and effect behind them, like how adding wheels below a large object makes it easier to move, or how raising a ramp makes a ball roll faster.

Engineering applies science, math, and technology to solving problems. Engineering is using materials, designing, crafting, and building – it helps us understand how and why things work. When children design and build with blocks or put together railroad tracks, they are acting as engineers. When children construct a fort of snow, pillows, or cardboard, they are solving structural problems. When they figure out how to pile sticks and rocks to block a stream of water or how objects fit together, they are engineering.

A creative mindset is critical for STEM subjects. That is why the arts was added to STEM to become STEAM. Scientists, technology developers, engineers, and mathematicians need to innovate and solve problems creatively. The subjects in STEAM are similar in their approach to learning. Active and self-guided discovery is core to the arts and to STEAM learning. Children engage in painting, pretend play, music, and drawing. Art is sensory exploration. Children can feel the paint on their fingers and see colors change the way paper looks. As they grow, children include symbols in their art that represent real objects, events, and feelings. Drawing and play-acting allow them to express what they know and feel, even before they can read or write. Music is also linked to STEAM skills such as pattern recognition and numeration. Research shows that early experience with creative arts supports cognitive development and increases self-esteem

Math is number and operations, measurement, patterns, geometry and spatial sense. From birth until age five, children explore everyday mathematics, including informal knowledge of "more" and "less," shape, size, sequencing, volume, and distance. Math is a tool children use every day! Babies and toddlers learn early math concepts like geometry and spatial relationships when they explore new objects with their hands and mouths. Teaching staff support math learning with infants and toddlers by intentionally using math language throughout the day. They make math concepts visible when they connect them to objects and actions. Infants begin to understand the math concept "more" early on and often use it to signal they want more food or drink.

Conclusion

As children grow, play becomes a bigger part of their lives. Exploration and hands-on learning naturally involve many STEAM skills. One study found that during unstructured free play, four- and five-year-old children spent almost half of their time engaged in math-related activity. Play often involves math language and thinking, even though math isn't the focus of their activity. Children talk about things like, "How much is a lot?" and "How little is little?" They often use their body to show size, such as stretching their arms to show how big a pumpkin is or holding fingers close together to show that something was "a little bit scary." This early play with math ideas and concepts lay the foundation for the development of more complex math and science skills later on. Simply having time to play on their own gives children one way to begin to build the foundations they will need throughout their lives. Adults can play an important role in arranging the environment for play to make sure it is conducive for these STEAM explorations.

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