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METHODOLOGY OF USING SIMPLE EXPERIMENTS IN INTRODUCING CHILDREN TO NATURE

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Abstract: This article highlights the pedagogical potential of using simple experiments in the process of introducing preschool children to nature. The importance of children directly observing natural phenomena, conducting experiments, identifying cause-and-effect relationships, and drawing independent conclusions is analyzed. The views of scholars such as J. Piaget, L. S. Vygotsky, J. Dewey, and M. Montessori on child development and experience-based learning are also discussed in relation to this methodology. The stages of organizing simple experiments and examples of practical experiments that can be used in preschool education are presented.

Keywords: preschool education, nature, simple experiment, observation, experimental method, environmental education, children's activity, practical activity, natural phenomena.

Today, introducing children to nature in the preschool education system and developing their environmental awareness, observation skills, independent thinking, and research abilities are considered important pedagogical tasks. The preschool period is an important stage when children's initial scientific understanding of the surrounding environment is formed. Therefore, connecting the knowledge acquired during this period with practical activities creates an important foundation for their further intellectual development.

The relevance of this topic is primarily determined by the need to educate children not as passive recipients of knowledge, but as active participants and young researchers. Unlike traditional methods of explanation and storytelling, simple experiments allow children to directly observe natural phenomena, interact practically with objects, ask questions, make predictions, and draw conclusions based on the results.

This aspect is scientifically consistent with John Dewey's views on experience-based learning. The scholar emphasized the importance of connecting education with children's real activities and experiences. From his perspective, knowledge is not simply information provided in a ready-made form, but a result formed through active experience. Therefore, studying natural components such as "water," "air," "soil," "plants," "light," and "temperature" through simple experiments in preschool education helps children acquire knowledge through practical activities.

Another important aspect of the topic is related to Jean Piaget's theory of cognitive development. Piaget demonstrated that children's thinking develops through their active interaction with objects and practical experiences. For preschool children, it is more effective to understand scientific concepts by seeing, touching, comparing, and experimenting with them rather than learning abstract information. Therefore, simple experiments can be considered an educational tool that corresponds to the age and psychological characteristics of preschool children.

From the perspective of L. S. Vygotsky's developmental education concept, experimental activities are also highly significant. The difference between activities that a child can perform independently and those that can be performed with adult assistance demonstrates the importance of pedagogical support during the learning process. During an experiment, questions from the teacher such as *"Why did this happen?", "What do you think will happen next?",* and *"How can we check this?"* encourage children's thinking and reasoning.

The relevance of the topic is also explained by the increasing importance of environmental education. Global issues such as climate change, rational use of water resources, waste reduction, and biodiversity conservation increase the need to develop environmental knowledge and responsibility from an early age. As children study natural phenomena through practical experiments, they begin to perceive nature not merely as an object of observation, but as an environment that requires care and protection.

Simple experiments also provide an opportunity to naturally develop elements of the STEAM educational approach in preschool education. For example, when studying the properties of water, children observe, compare, measure, record results, and draw conclusions.

For example, consider the simple experiment "Which objects float in water?" The teacher provides children with objects such as a stone, a piece of wood, a plastic lid, a spoon, and a ball. First, children observe the objects and determine whether they float or sink in water — Science (S). Then they compare the objects according to their weight, size, and shape, and count how many objects float and how many sink — Mathematics (M). Children try to answer the question, *"Why do some objects float while others sink?"* and think about how to place the objects in water in order to test the result — Engineering (E). They record the results using drawings, symbols, or a simple table — Technology (T). In addition, children can make a boat from objects that float on water or create and demonstrate a shape that floats well — Art (A). Thus, all S–T–E–A–M elements can be integrated naturally within a single simple experiment.

Such activities contribute to the development of children's initial skills in natural sciences, mathematics, engineering thinking, and creative thinking.

Therefore, the scientific and pedagogical relevance of studying the topic "Methodology of Using Simple Experiments in Introducing Children to Nature" is reflected in the following aspects:

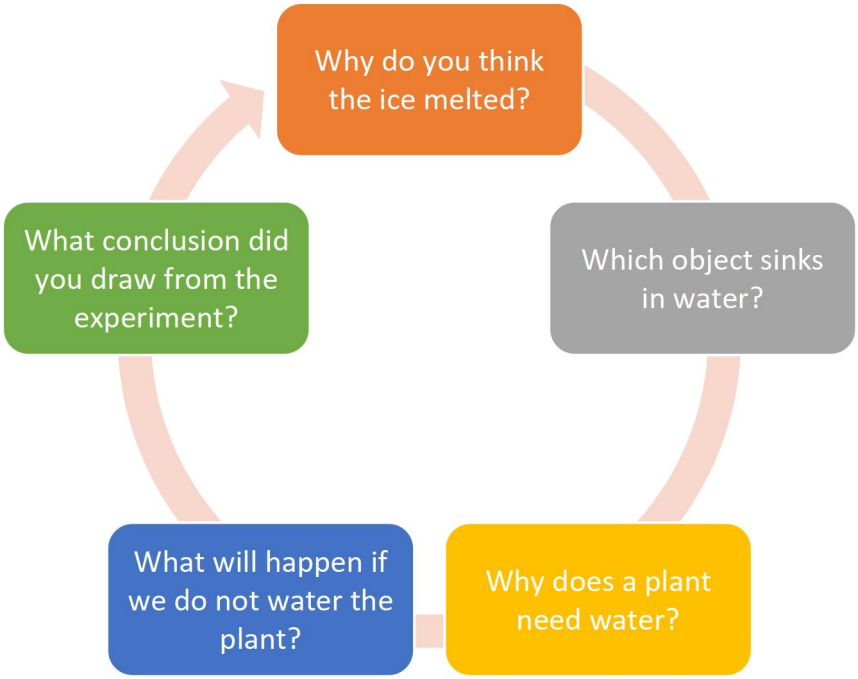
- the need to develop children's knowledge of nature through practical activities;
- developing initial research and scientific thinking skills in preschool children;
- improving the ability to observe, compare, analyze, and draw independent conclusions;
- developing environmental knowledge and a responsible attitude toward nature from an early age;
- widely implementing modern, child-centered, and active teaching methods in preschool education;
- integrating educational content with modern STEAM and experience-based learning approaches.

A simple experiment is a method that allows complex scientific concepts to be explained to children in a simple, practical, and age-appropriate way. For example, in the topic "Properties of Water," the teacher can pour water into several different containers and observe together with the children how the shape of the water changes according to the shape of the container.

The Swiss psychologist Jean Piaget demonstrated the importance of active movement and direct interaction with objects in the development of children's thinking. Preschool children develop concepts by touching, comparing, observing, and practically interacting with objects in their environment.

Therefore, learning about natural phenomena through experiments corresponds well to the developmental characteristics of preschool children.

L. S. Vygotsky, in turn, emphasized the importance of cooperation with adults and question-and-answer activities in children's development. During experiments, instead of providing ready-made answers, the teacher should ask questions that encourage children to think independently. For example:



Such questions help children develop independent thinking and understand cause-and-effect relationships. When organizing experiments in preschool educational institutions, children's age, safety, and individual abilities must be taken into consideration.

Maria Montessori attached great importance to children's independent activities, direct interaction with objects, and acquisition of knowledge through personal experience. In this respect, simple experiments are closely related to the Montessori principle of the "child as an active researcher."

It is particularly important to support children's curiosity and initiative while they are learning about nature. Instead of giving ready-made answers, the teacher should create conditions that enable children to find answers independently.

When organizing simple experiments effectively, the teacher acts not only as a provider of information but also as a facilitator and partner. The teacher:

1. creates safe conditions for conducting experiments;
2. guides children toward observation;
3. asks problem-based questions;
4. listens to children's predictions;
5. discusses the results of the experiment;

6. encourages children to draw independent conclusions.

If experiments are combined with elements of play, their attractiveness for children increases. For example, play-based activities such as “Little Scientists’ Laboratory,” “Let’s Discover the Secrets of Nature,” and “Water Researchers” can be organized.

Conclusion

In conclusion, the use of simple experiments in introducing preschool children to nature is an effective pedagogical method. Through experiments, children directly observe natural phenomena, engage in practical activities, ask questions, make predictions, and ultimately draw independent conclusions.

J. Piaget emphasized children’s acquisition of knowledge through active movement and experience; L. S. Vygotsky emphasized cooperation with adults and the importance of guiding questions in the educational process; and J. Dewey emphasized connecting education with real-life experiences. The ideas of M. Montessori also highlight the importance of children’s independent practical activities. These theoretical perspectives strengthen the pedagogical foundations for using simple experiments in preschool education.

References

1. Qodirova, F. R., Toshpo‘latova, Sh. K., Kayumova, N. M., & A’zamova, M. N. (2019). *Maktabgacha pedagogika*. Tashkent: Tafakkur.
2. Xasanboyeva, O. U., Tojiyeva, M. X., & Toshpo‘latova, Sh. K. (2011). *Maktabgacha ta’lim pedagogikasi*. Tashkent: Ilm Ziyo.
3. Republic of Uzbekistan. (2019). *Law of the Republic of Uzbekistan “On Preschool Education and Upbringing”*. Tashkent.
4. Cabinet of Ministers of the Republic of Uzbekistan. (2020). *State Standard of Preschool Education and Upbringing*. Tashkent.
5. Ministry of Preschool Education of the Republic of Uzbekistan. (2022). *Ilk Qadam State Curriculum*. Tashkent.
6. Bybee, R. W. (2013). *The Case for STEM Education: Challenges and Opportunities*. NSTA Press.
7. Yakman, G. (2008). *STEAM Education: An Overview of Creating a Model of Integrative Education*. Virginia Polytechnic Institute and State University.
8. Quigley, C., & Herro, D. (2016). Developing a conceptual model of STEAM teaching practices. *School Science and Mathematics*.
9. Perignat, E., & Katz-Buonincontro, J. (2019). STEAM in practice and research: An integrative literature review. *Thinking Skills and Creativity*.
10. Urry, L. A., Cain, M. L., Wasserman, S. A., Minorsky, P. V., & Reece, J. B. (2020). *Campbell Biology*. 12th ed. Pearson.
11. Freeman, S., Quillin, K., & Allison, L. (2020). *Biological Science*. 7th ed. Pearson.

12. Sadava, D., Hillis, D. M., Heller, H. C., & Berenbaum, M. R. (2020). *Life: The Science of Biology*. 12th ed. Oxford University Press.

13. Raven, P. H., Johnson, G. B., Mason, K. A., Losos, J. B., & Singer, S. R. (2020). *Biology*. 12th ed. McGraw-Hill Education.