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DEVELOPING CONCEPTIONS OF NATURAL PHENOMENA IN CHILDREN OF LOWER-KINDERGARTEN AGE THROUGH INQUIRY-BASED RESEARCH ACTIVITIES

Middle preschool age (4–6 years) is characterized by the active development of a child's cognitive sphere, the formation of observational skills, logical thinking, and the ability to establish cause-and-effect relationships. Natural phenomena – changes in weather, water cycles, atmospheric events, and seasonal changes in flora and fauna – become an accessible and engaging field for developing curiosity and scientific thinking.

However, modern pedagogical practice is often limited to passive observation or oral explanation, which does not always ensure the formation of holistic conceptions of nature. This necessitates the use of active learning methods, particularly inquiry-based research activities, which allow children to independently discover underlying patterns, test hypotheses, and draw conclusions [1].

The problem of forming conceptions of natural phenomena in preschoolers is actively studied by domestic and foreign psychologists and educators. In many studies of recent decades by scholars such as O. Bilan, N. Horopakha, N. Kot, N. Lysenko, S. Nikolaieva, Z. Plokhyy, N. Ryzhova, and others, the tasks of familiarizing children with nature have been clarified, and the content, primary forms, and methods have been defined.

The essence, structure, and significance of research activity have been considered in the works of H. Bielenka, O. Ivanova, N. Lysenko, S. Nikolaieva, and N. Yarysheva. Modern pedagogical approaches (B. Gross, E. Thomas) emphasize the integration of play and experiments into the process of cognition, which increases children's motivation and interest.

Thus, literature analysis indicates that the effective formation of conceptions regarding natural phenomena is possible only through the active involvement of children in inquiry-based research activities.

The aim of this article is to substantiate methodical approaches to forming conceptions of natural phenomena in middle preschool children through inquiry-based research activities and to provide practical recommendations for educators and teachers.

Middle preschool age is characterized by the rapid development of a child's cognitive sphere. During this period, children exhibit extraordinary curiosity, and their questions often go beyond simple observation: "Why does rain fall down?", "Why does ice melt faster in the sun than in the room?", "How does a plant grow from a seed?". This natural curiosity serves as the basis for organizing inquiry-based research

activities, allowing the child not just to receive ready-made knowledge, but to discover the regularities of the surrounding world with their own hands [2].

Psychological characteristics of middle preschoolers significantly determine the approach to research work. Children think in visual-image terms, relying on direct experience. For instance, they easily notice that ice melts, water evaporates, or wind moves leaves. However, to form a holistic understanding of the causes of these phenomena, they need the educator's support: explanations, demonstrations of alternative situations, and help in observing and comparing results [3].

Inquiry-based research activity is organized in several stages.

At the first stage, the educator formulates a problem question or creates a situation that sparks interest. For example: "Let's find out why water evaporates differently in different containers." Such tasks stimulate the desire to act, experiment, and observe.

At the second stage, children conduct observations or experiments. They interact directly with natural objects or models using simple materials—water, ice, balloons, seeds, and soil.

Example 1: During the "Water and Heat" experiment, children place ice in sunlight and shade, noting the difference in melting speed and concluding how temperature affects the process.

Example 2: In the "Air and Movement" experiment, they inflate balloons and observe how wind moves light objects, discussing wind power.

Example 3: The "Plant Growth" experiment allows children to observe how seeds sprout under different conditions (sufficient vs. insufficient watering, sun vs. shade).

At the third stage, children record their results. This can include drawings, diagrams, or verbal descriptions. This process helps systematize knowledge and forms primary scientific analysis skills.

At the fourth stage, a discussion of the results is held. The educator helps children compare their observations with expected outcomes and formulate conclusions [4; 5].

Inquiry-based research activity allows children not only to gain knowledge about natural phenomena but also to develop logical and critical thinking, independence, speech, and social skills. They learn to express their thoughts, argue their conclusions, and collaborate with peers during group experiments.

Inquiry-based research activity is an effective method for forming conceptions of natural phenomena in middle preschool children. It promotes the development of observation, curiosity, and environmental competence. The use of active learning methods allows children to become active explorers of the world, forming a positive attitude toward nature and providing a foundation for future schooling. Therefore, actively involving middle preschoolers in research and experimentation is a key means of developing a holistic perception of the environment.

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