

## METHODS FOR FORMING STUDENTS' RESEARCH SKILLS BASED ON A HEURISTIC APPROACH

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**Abstract.** *In this article reveals the pedagogical possibilities of developing the research skills of primary school students using heuristic methods. Methods, techniques and tasks that are most effective in developing research skills in primary school students are presented. Accordingly, the unique pedagogical features of the formation of the first elements of research skills in primary school students were analyzed. In addition, it has been shown that logical exercises and tasks expand the cognitive, creative and analytical thinking capabilities of primary school students.*

**Keywords:** *primary schoolchildren, research skills, heuristic methods, cognitive-logical tasks, problematic issues, small-scale research, design technologies.*

Research activities are formed as a result of students' learning activities based on heuristic research. With the help of research skills, students achieve a certain result in the educational process. They develop logical and creative thinking. Research activities formed by students are carried out using heuristic methods, tasks and heuristic questions. The first elements of research skills are revealed in mathematics and native language lessons in primary school through logical problems and exercises. Such exercises ensure the productivity of students' research activities.

Logic exercises and problems stimulate students' mental activity, helping them explore and analyze the environment, existence, people and their own behavior. Accordingly, exercises and tasks are important in developing the first elements of research skills in primary school students. Some aspects of activities to encourage the curiosity of younger schoolchildren using heuristics R.G.Safarova, B.R.Adizov, M.Makhmudov, R.Ibragimov, G.Nadjmiddinova, Kh.P.Nazarova, R.Nurjanova, G.G.Khasanova, F.M. Kochkarova, N.G. Dilova, the pedagogical foundations of the formation of independent thinking skills and social activity in the development of students' cognitive activity were studied by B.B. Mamurov, Z. Nishonova, G. Ibragimova, Kh. M. Tojiboeva, N. T. Tosheva, Z. A. Kholmatova. Problems of developing heuristic and cognitive skills of students are reflected in the works of O. Karakhonova, D. Gaipov, Zh. Shomurodov.

It is known that elementary school students are more inclined to study the environment. They cannot meet these needs by working on exercise and reproductive issues. Heuristic questions, assignments, exercises and tasks serve to develop the creative abilities of primary school students. As a result, their knowledge will expand.

It is important to set challenging tasks for students to develop initial research skills. With the help of heuristic and problematic tasks, primary school students gain experience in intellectual activity in their native language, reading and mathematics lessons. Because these tasks ensure effective assimilation of the knowledge presented to students. As a result, students will be motivated to carry out small-scale research. At the same time, such tasks expand analytical and reflective thinking.

In addition, logical exercises and tasks expand the cognitive, creative and analytical thinking capabilities of primary school students. Heuristic questions and tasks help develop the curiosity of primary school students, as well as develop their intellectual sphere. The process of

developing research skills in primary school students is organized on the basis of the principles of gradualism, movement from simple to complex and integration. In this process, students' inductive and deductive reasoning abilities are enhanced.

Heuristic tasks include a set of exercises, tasks and questions that develop students qualitatively and productively, and encourage curiosity and creativity. While working on them, primary school students are tasked with developing research skills. Primary school students independently find the necessary knowledge to complete these tasks. As a result, they do little research. That is why it is advisable for primary school teachers to pose as many heuristic, problematic questions, tasks, exercises, and problems to students as possible.

In the process of working on heuristic and problematic tasks, it is important that primary school teachers learn to independently choose methods of activity. In this process, elementary school teachers must be able to effectively use middle school didactic projects. To do this, primary school teachers must have experience in a creative approach. Based on the acquired knowledge, students demonstrate their initial research skills in the process of learning activities organized on the basis of the project method. The work process using the project method is carried out on the basis of the acquisition of natural knowledge. In this process, students develop research interests and research motives.

In situations of working on heuristic and problem-based tasks, students carry out learning activities, such as searching for necessary knowledge and analyzing problems. Such educational activities are of a research and analytical nature. Students' research activities have specific components. Forming students' research skills based on setting heuristic tasks for students requires special professional skills from the teacher.

The initial emergence of research skills is manifested in students' modeling, design, and construction. To the list of knowledge that motivates primary school students to research activities, you can add interesting natural phenomena, technical phenomena, grammatical problems, and interesting mathematical problems. Theoretical knowledge, which serves the development of students' intelligence, is the main source of the formation of their research motives.

Primary school teachers can use various games, project-based educational technologies, quizzes, and brainstorming situations based on a heuristic approach to develop students' research skills. Teachers must effectively use cognitive methods in developing research skills in primary school students. With the help of such cognitive methods, they understand the essence of the phenomenon being studied. In this process, they will be able to sense things around them. Another important method is the method of immersion in the thought process. This method encourages students to focus on the knowledge being learned, the tasks to be completed, understanding the main idea being expressed, and learning about specific aspects of it. It provides students with the necessary skills and abilities to understand the essence of the educational materials being studied and their application. In such situations, teachers ask students questions that guide them toward exploration.

The Visualization method also plays an important role in developing students' research skills. Elementary school students perceive what they see and are eager to explore it. The "symbolic vision" method is of particular importance in developing students' research skills. In this process, they perceive the meaning and essence of symbols and symbols. The "Use of heuristic questions" method is one of the effective methods of stimulating students to research activities. The "comparison" method primarily serves to develop students' analytical thinking. It is known

that analytical thinking is an important condition for the successful development of research skills in students. The “Differentiation of Evidence” method is also important in developing students’ research skills. As a result of working on the basis of this method, students will be able to compare different arguments with each other and identify differences and similarities between them.

In particular, the method of “heuristic observation” has a leading role in developing students’ research skills. This method serves to teach students to search for evidence, find important aspects of it, and evaluate evidence.

The method of “heuristic research” is also of particular importance in developing research skills in students in grades 3-4. During this period, students are more inclined to independent research, practical application of knowledge, and conducting small-scale research based on acquired knowledge. That is why teachers should systematically use the “Heuristic Inquiry” method. With the help of the teacher, students select an object of research, study and analyze its specific aspects.

It is clear that only as a result of applying all of the above methods, based on the level of mastery of primary school students, the capabilities of independent and analytical thinking, will they effectively develop their research skills by the opportunity to achieve.

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