

The Formation of Research Culture in Younger School Children

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Abstract: In an era when the individual is in the first place, both in the social and educational space, it is necessary to create favorable conditions for its implementation. Scientists and methodologists note that in recent years there has been a tendency to a loss of interest on the part of pupils towards schooling. Teachers have great difficulty in increasing the attention of schoolchildren to learning. Till now teachers are constantly searching for new methods, techniques and forms of training because many problems within the framework of the lesson system are not solved.

Key words: Research culture • Education • Elementary school • Psychology • Humanization

INTRODUCTION

In a message of the President of the country N.A. Nazarbayev to the people of Kazakhstan "Kazakhstan-2050" reads as follows: "Our path to the future is connected with the creation of new opportunities for revealing the potential of the Kazakhs. A developed country in the 21st century is active, educated citizens. The result of the training of schoolchildren should become their mastery of the skills of critical thinking, an independent search and in-depth analysis of information. It is necessary to give new impulses to the development of All-Kazakhstan culture. A long-term concept of cultural policy should be developed. It should identify measures aimed at creating a competitive cultural mentality of Kazakhs, the development of modern cultural clusters.

- We must intensively introduce innovative methods, solutions and tools into the domestic educational system, including distance learning and on-line training, accessible to all comers.
- It is necessary to get rid of obsolete or unclaimed scientific and educational disciplines while strengthening the sought-after and promising areas.
- To change the focus and emphasis of the curricula of secondary and higher education, including programs for teaching practical skills and obtaining practical qualifications [1, 2].

The State Program for the Development of Education in the Republic of Kazakhstan for 2011-2020 indicates that "from an early age, education plays an important role in the formation of social, emotional and other vital skills. This is a convincing argument in favor of further development of the entire range of educational services. Kazakhstan needs a radical modernization of education. Therefore, a new national vision is proposed: by 2020, Kazakhstan is an educated country, a smart economy and a highly skilled workforce. The development of education should become a platform on which the future economic, political and socio-cultural prosperity of the country will be based" [2].

The Law of the Republic of Kazakhstan "On Education" as of 10.07.2012 specifies that the main task of the education system is to create the necessary conditions for obtaining education aimed at the formation, growth and professional development of the individual on the basis of national and universal values of science and practice [3].

In the Concept of Education of the Republic of Kazakhstan until 2015, the primary goal of an elementary school is defined as the provision of the initial formation of the child's personality, the identification and development of his abilities. The education and upbringing at this stage focuses on the formation of a positive motive and ability to learn, to acquire solid skills in reading, writing, numerating, elementary experience of language communication, creative self-realization, culture

of behavior, personal hygiene and healthy lifestyle, thus creating a basis for the subsequent development of educational programs of the primary school [4].

The questions of the activization of schoolchildren's educational and cognitive activity are one of the most urgent problems, including both social and psychological aspects. The first of them is that at this stage of development of our society there is a profound transformation in all spheres of people's lives - material production, social relations, spiritual culture. All this requires a young man entering into an independent life, the most modern education, high intellectual and physical development, a deep knowledge of the scientific and technical and economic bases of production, a conscious creative attitude to work. To solve this problem, it is necessary to move away from the classical formation of knowledge and skills and move to the ideology of development on the basis of a personality-oriented model of education. One of the ways to implement this principle can be the organization of creative, research and project activities of schoolchildren.

It is advisable to introduce the basics of research into the educational process in primary school. One of the features for the organization of research activities at the primary level of the school is that not only strong students but also children who are lagging can take part in it. Just the level of research will be different. The aim of the organization of students' research activities is the formation of their cognitive activity. The goal can be achieved if the following tasks are solved: the development of logical thinking, creative abilities, outlook, oral and written speech; Abilities to generalize and systematize information, communication skills; Formation of observation and attention, skills of working with artistic and scientific texts [5].

The urgency of the problem is also caused by the fact that changing the way of the initial stage of education is the main direction of today's reforms. The assimilation of the subject material of learning from the goal becomes a means of such emotional, social and intellectual development of the child, which ensures the transition from learning to self-education and consequently, the successful socialization of the younger student.

MATERIALS AND METHODS

The strategic goal of reforming education is child-centered, developing its creative abilities, independence, initiative, aspiration for self-realization and self-determination.

The humanization of education as a way of achieving the goal of reforms presupposes the maximum personification and differentiation of the education and upbringing of children.

The experience of the students' educational and research activities over the years has become the basis for developing new approaches to the organization of the educational process in the context of the pedagogy of development, the mastering of innovative technologies aimed at changing the nature of education as the assimilation of the amount of knowledge and skills - to search, motivating students to self-determination [6].

As the experience of the organization of students' educational and research activities in educational institutions of various types shows, educational and research activities contribute to:

- The development of interest, expansion and actualization of knowledge in the subjects of the school curriculum, development of ideas about intersubject communications;
- The development of intellectual initiative of students in the process of mastering basic and additional educational programs;
- The creation of prerequisites for the development of a scientific way of thinking;
- The development of a creative approach to any kind of activity;
- The formation of an attitude toward the prestige of pursuing a scientific activity, fundamental sciences;
- The formation of a sphere of meaningful subject communication within the children's collective, between students, teachers, scientists and specialists;
- Training in information technologies and working with communication media;
- The formation of a developing educational environment for the child;
- Professional self-determination of children;
- Obtaining pre-professional training;
- Meaningful organization of free time for children;
- The formation of the scientific and pedagogical community of children, teachers, scientists and specialists who implement various programs of educational and research activities [7].

At present, students' research activities are presented in various forms. The main of them are associations of students by interests, conferences, olympiads, tournaments, exhibitions, scientific and methodological collections, student scientific unions, small academies of sciences [8].

The desire to penetrate into the innermost secrets of being is born even on a school bench; already in an elementary school one can meet students who are not satisfied with working with a school textbook, they are not interested in working in the classroom, they read vocabularies and special literature, they seek answers to their questions in various areas of knowledge. Therefore, it is very important to identify at school all those who are interested in various fields of science and technology, to help realize their dreams, to bring their children on the road leading to a search in science, in life, to help reveal their abilities. The creative activity of the junior schoolchild begins with an elementary school, so the period of elementary education is considered as a preparatory stage for the participation of primary school students in targeted research and development activities in the future.

At present, students' research activities are carried out in all educational institutions: schools, lyceums, gymnasiums and additional children's education institutions.

Traditionally, the research activities of students continue to develop successfully in institutions of additional education for children, such as the Palace of Creativity, the Palace of Children and Youth, etc.

The research activity of students in many institutions becomes a means of integrating the educational programs of general, secondary and additional education, which allows to combine the advantages inherent in the educational programs of these two types: the orientation of general secondary education for the fulfillment of the state and social order of the society for the reproduction of the professional and human potential and the direction of the additional education for free choice by the child and his family of types and forms of activity, the formation of his own ideas about the world, the development of cognitive motivation, abilities and inclinations. This integration path makes it possible to create a special educational environment that is comfortable both for the child and for the teacher, based on the interaction of children and the teacher in the process of objective activity, the real authority of the mentor and friend and the respectful attitude of the subjects of this activity to each other.

One of the most important tasks of general education is the achievement of a level of students' education that would be sufficient for an independent creative solution of world outlook and research problems of a theoretical or applied nature (V.I. Andreev, Z.I. Vasilieva, Ye.I. Kazakova, I.A. Kolesnikova, O.Ye. Lebedev, A.S.

Robotova, G.S. Sukhobskaya, A.P. Tryapitsyna). At the same time, the fact that students master the methods of research activity scientists attribute to the essential characteristics of a high level of education of modern schoolchildren. The research activity contributes to the development of cognitive interest of younger schoolchildren, stimulates their cognitive activity.

In the studies of V.I. Andreev, S.P. Arsenov, L.V. Guryev, V.V. Davydov, L.V. Zankov, G.V. Kozlova, L.M. Fedoryak, Z.A. Khayretdinova, D.B. Elkonin emphasizes that the originality of thinking, creativity of schoolchildren is most fully manifested and successfully develop in a variety of educational activities that have a research focus.

The research data (L.P. Vinogradova, A.V. Leontovich, A.N. Poddyakov, A.I. Savenkov) speak about the possibility of successful teaching of the elements of the study research already at the initial stage of school education.

Thus, the relevance of research is determined by the social order for a creative, independent personality; The need of a modern school in the development of pedagogical technology for developing research skills in junior schoolchildren; The need to enrich the practice of organization of research activity existing in the primary school [9].

The experience of the students' educational and research activities over the years has become the basis for developing new approaches to the organization of the educational process in the context of the pedagogy of development, the mastering of innovative technologies aimed at changing the nature of education as the assimilation of the amount of knowledge and skills - to search, motivating students to self-determination [10].

On the basis of the foregoing, it can be argued that during the period of the implementation of education reforms in our country, the relevance of the organization of the research activity of junior schoolchildren is significantly growing. The research activity and behavior of a schoolboy is a complexly integrated education, it covers the entire personality (motivational, goal-oriented, meaningful, procedural, evaluative components) [11].

Relying on the above scientific works, creatively working teachers strive to organize in the practice of teaching the research activity of schoolchildren. However, this concerns, first of all, the organization of research activities of students in the senior and middle level and in the case of a primary school, this practice has not received sufficient dissemination. Since research activities are quite complex, it is studied in the vast majority of

cases in adolescents: it is believed that younger schoolchildren are not ready for it. At the same time, in domestic psychology, there is a rich experience in the study and formation of cognitive, research activities of children (P.Ya. Galperin, A.V. Zaporozhets, A.N. Poddyakov, A.I. Savenkov, N.F. Talyzina). However, in pedagogy, the problem of organizing the research activity of junior schoolchildren is poorly developed. Thus, the contradiction between the humanistic value of research activity, consistent with the age of junior schoolchildren and the insufficient development of the pedagogical theory and practice of conditions and technology for its practical application in the educational process of the mass primary school becomes evident [12].

The theoretical and methodological basis of the research:

- philosophical and psychological-pedagogical concepts of personality development in activity (L.S. Vygotsky, A.N. Leontiev, S.L. Rubinshtein); Psychological and pedagogical theories of developmental learning (V.V. Davydov, L.V. Zankov, A.M. Matiushkin, N.A. Menchinskaya, V.D. Shadrikov, B.D. Elkonin);
 - Ideas of humanistic personal-oriented pedagogy (Sh.A. Amonashvili, V.A. Sukhomlinsky, V.V. Serikov, I.S. Yakimanskaya);
 - Theoretical concepts of cognitive activity and student autonomy (M.N. Skatkin, I.Ya. Lerner, M.I. Makhmutov), creative self-development of the person (V.I. Andreev, A.M. Matushkin);
 - The concept of the development of research activities of children [13]; Psychological substantiation of the development of research activity in childhood (A.V. Leontovich, A.N. Poddyakov, A.I. Savenkov);
 - The conceptual basis of pedagogical technologies (V.P. Bepalko, M.V. Klarin, V.M. Monakhov, I.Yu. Sokolova, etc.)
- Methods of research:
- Theoretical methods: the analysis of philosophical, psychological and pedagogical literature, educational and methodological documentation; The analysis of state educational standards and textbooks; The historical analysis of the problem and the subject of research; The modeling in the aspect of the problem under study;
 - Empirical methods: the pedagogical observation; the diagnosis (questionnaires, diagnostic interviews); The pedagogical experiment; The analysis of products of educational and pedagogical activity.

Experimental Work on the Organization of Research Activity of Junior Schoolchildren: Experimental work was carried out on the basis of the Lyceum No. 62 of Astana city in 3 "B" and 3 "V" classes, where the 3 "B" class was the experimental one and 3 "V" as the control class.

The purpose of the experiment was to test the effectiveness of technology for the formation of research skills of junior schoolchildren (search, information, the ability to represent the result of research, organizational and evaluation skills), taking into account the following pedagogical conditions: the consideration of age and individual characteristics in the organization of research, the motivation of research activities, the position and professional activity of the teacher who organizes the study [14].

The tasks of the experimental work were as follows:

- To determine the existing level of the formation of research skills of junior schoolchildren in experimental and control classes.
- To develop a pedagogical technology aimed at developing research skills of junior schoolchildren and ensure its implementation in special training sessions.
- To trace the developmental dynamics of research skills of primary school students (experimental and control).

Experimental work aimed at solving these problems included the following stages:

- The staging section of the existing level of the formation of students' research skills in the experimental and control classes.
- Conducting training sessions on the technology developed by us, contributing to a purposeful process of developing research skills on the basis of the experimental class.
- Comparative analysis of the results obtained when assessing the levels of development of research skills in the experimental and control classes.

The experiment consisted of three stages:

Stage 1: The diagnosis of research skills of junior schoolchildren.

Stage 2: The organization of research activities of junior schoolchildren.

Stage 3: The analysis of the results of research activities of junior schoolchildren.

We identified five groups of research skills of junior schoolchildren:

- The ability to organize their work (organizational);
- Skills and knowledge associated with the implementation of research (search);
- The ability to work with information, text (information);
- The ability to design and present the result of their work.
- Skills related to the analysis of their activities and evaluation activities (evaluation).

Thus, we define the research skills of children of primary school age as intellectual and practical skills related to the independent choice and application of techniques and methods of research on materials accessible to children and corresponding to stages of the study.

The criteria we identified on the basis of the analysis of the relevant literature (L.I. Bozhovich, A.G. Iodko, Ye.V. Kochanovskaya, G.V. Makotrova, A.K. Markova, A.N. Poddiakov, A.I. Savenkov), allow to assess the formation of research skills of primary school students:

- The practical readiness of the student to carry out research activities is manifested in the fact that the child independently chooses a relevant research topic for him, outlines the steps of work on this topic, applies various methods of research (working with literary sources, observation, etc.), formalizes and represents the result (product) of its work.
- The motivation of the research activity of students is considered by us as the desire of the child to learn new things, to perform certain actions to search for interesting knowledge, to participate in educational research. The student shows cognitive activity in the process of solving educational problems, interest in new topics and ways of working. The criterion is seen in the dynamics of children's motives associated with the conduct of research: from narrow social motives (to achieve praise) to a broad cognitive (the desire to find new knowledge, to learn how to find information).
- The manifestation of creativity in the research activities of children was taken into account in the approaches of choosing the topic, defining research objectives, in productivity in finding solutions to

problems; On the originality of approaches to the choice of research paths, the creation of a new product, the design and presentation of results, the ability to see the subject under study from different angles and positions.

- The degree of manifestation of independence. A feature of junior school age is that in the educational and cognitive activities the leading role belongs to the teacher or other adults. As a rule, the subject of children's research lies within the zone of the child's nearest development and it is difficult for him to cope with the research without outside help. However, as you master the skills of research, the participation of adults in his work is reduced and the position of the teacher varies from leader to organizer, assistant, consultant.

The evaluation of each of these criteria was correlated with the levels of formation of skills in the research activities of students in lower grades, identified and described in our work:

- We define the baseline level as already existing, formed on the basis of spontaneous research experience of children and educational skills obtained during the first grade. The initial level can be given the following characteristics: low level of interest in conducting research, lack of knowledge about research activities, skills in research. It is possible to carry out research activities by analogy. The student seldom takes the initiative and the original approach in the study, he does not express ideas, suggestions, assumptions on the work.
- The initial level is characterized by the appearance of external motives to conduct research, the ability, with the help of the teacher, to find the problem and offer various options for its solution. At the initial stage, children are able to perform elementary short-term studies by analogy with the help of adults. There is a knowledge of the basics of knowledge on the organization of his research work, some simple research skills. The manifestation of creativity can be regarded as low.
- The productive level has the following characteristics: stable internal and external motives for conducting research work, there is a desire to conduct research independently (individually or with a group). The student has a certain knowledge of research activities, has many skills in the implementation of the study (can determine the topic,

Table 1: Levels of development of research skills of junior schoolchildren

Criterion / Level	The practical readiness in the implementation of the study	The motivation of educational and research activities	The manifestation of creativity in teaching and research activities	The self-reliance in the implementation of educational research work
The initial level	The absence of knowledge and specific skills of educational and research activities	Low motivation	Actions by analogy	Only under the guidance of the teacher
The elementary level	The initial knowledge and elementary skills for the implementation of collective study	External motives prevail	The collective creativity: new ideas are generated in a collective search	The collective search by analogy can be carried out without direct participation of the teacher, difficulties in individual independent work
The productive level	Skills related to the definition of the topic, the search for information in books, the ability to work with text, highlight the main thing; The ability to present the results of a study.	External and internal motives for the research	The ability to choose the original topic, it is interesting to present the result of the work	Some stages of the study can be carried out independently, others - with the help of parents and the teacher
The creative level	The abilities of educational and research activities related to the definition of the topic, the purpose, the tasks of the study, the use of accessible methods, the search for information in the library, on the Internet, the methods of fixing and processing it, the compilation of graphs, tables, schemes, drawings, the presentation of the research result, its analysis and evaluation	Stable internal cognitive motives	The ability to display originality in the choice of topics, search methods, presentation forms, express many ideas for solving problems, look at the problem from a new position	Virtually all stages of the study can be implemented independently

purpose and objectives of the study with the help of a teacher or independently, work with sources of information); Demonstrates the possibility of an original approach to solving the problem, presenting the result of its activities [15].

- The creative level can be defined as follows: there is a constant interest in conducting various kinds of research, the ability to independently and creatively approach the choice of the research topic, the ability to set goals, tasks, to find ways to solve the problems positively; A high proportion of independence in the implementation of work at all stages of the study; The ability to present originally the result of the activity (Table 1).

To determine the level of development of research skills in younger schoolchildren, the following diagnostic methods were used:

- Pedagogical observation, carried out by the teacher in lessons in various disciplines, in the study activities;

- analysis of products of children's research activities;
- Questionnaires that allow to identify and assess the formation of specific skills, the availability of knowledge about research activities, the manifestation of creativity, the degree of independence in research work, the motivational attitude towards the educational study of junior schoolchildren.

The effectiveness of the organization of research activities is reflected by a matrix of criteria. On the organizational aspect, the criteria for the effective organization of research activities of junior schoolchildren are divided into three blocks:

According to the first block, the criterion is the composition of the subjects of the organization of research activities, which includes children, their parents, teachers, scientific leaders [16].

On the second block: the presence of a different-level (school, district, municipal level) system of regulatory support for the activities of subjects of the organization of junior schoolchildren's research activities.

On the third block, three criteria are distinguished:

- The availability of active forms of subjects' joint activity for the organization of research activities (at least at the school level);
- The availability of programs and cyclograms of joint activities of subjects for the organization of research activities;
- The presence of programs and cyclograms of methodological support of joint activity of subjects of the organization of research activity.

According to the second aspect, based on the essence of the personal orientation of the organization of research activities as an educational process, its effectiveness is determined by three blocks of criteria: the number of participants, the quality of activities and the content of the results of activities.

The criteria for the first block have the following composition:

- The positive dynamics of the number of junior schoolchildren taking part in conferences at the school, district, municipal level;
- The positive dynamics of the number of educational institutions that organized the participation of junior schoolchildren in conferences at the school, district and municipal levels.

On the second block:

- Improving the quality of research work of junior schoolchildren;
- Increase the level of professional competence of teachers-leaders of research activities of junior schoolchildren.

On the third block:

- The positive dynamics of the developmental level of research skills of junior schoolchildren, actively engaged in research activities.

In accordance with the developed model, we organized the research activity of junior schoolchildren: the best children's works are sent to a school conference.

The introductory effectiveness of the organizational model of junior schoolchildren's research activities can be traced in the organizational aspect:

- Research activities include younger schoolchildren, their parents, leaders of research activities;
- The regulatory and legal framework for supporting the organization of research activities has been created;
- Various forms of research work with students have been organized for the purpose of qualitative preparation of students.

The preparatory work for the study began with the formulation of tasks:

Educational: the activation and actualization of knowledge obtained by students in the study of a particular topic; the systematization of knowledge; the acquaintance with a complex of materials, which obviously go beyond the school curriculum.

Developing: the development of the ability to reflect in the context of the topic, analyze, compare, draw their own conclusions; to select and systematize the material; to use ICT in the registration of the conducted research; to present publicly the results of the study [17].

Educative: to create a product that will be interesting to others and in demand by others.

In the work, we used special games and exercises to activate the research activity of children, helping to master the primary skills of conducting independent research.

The first stage is training sessions with the class, giving the opportunity to introduce each child to the technique of conducting the research.

From the first days of classes we considered the methods of research, that is, from where it is possible to obtain information. This is to ask questions to yourself, ask an adult person, look at books, observe, conduct an experiment, look at a computer, etc.

Subsequently, we conducted a lesson-training on which we learned how to collect all available information and process it in the same way as scientists do. For example, they offered the task: to prepare a message about the brown bear. Our task is to bring the guys to the idea that the set of methods depends on our real capabilities. The more of them, the better and more interesting the work will go. Having determined the sequence of work, they began to collect the material. But this information is difficult to hold in your head or to write down, creating a diagram [17].

The ability of children to make short notes, to invent icons indicates the level of development of associative thinking and creative abilities. At first, parents were able to help us, to whom we explained the purpose of the

research, their effectiveness. Together with the children, they made a selection of literature, read articles on the topic. The necessary information with the students was recorded on the layout sheet. We analyzed and summarized the collected information, then the researchers made reports. After the speech, they held a discussion and gave the opportunity to ask questions. So the guys got acquainted with the general scheme of activity [17].

Then we worked on forming skills to see problems, to ask questions, to put forward hypotheses, to define concepts, to classify observations and experiment skills, to draw conclusions and deductions, to structure materials, etc.

We offered tasks and exercises for developing the ability to see problems that were applied in practice. The task: look at the world with other people's eyes. One of the most important properties in identifying problems is the ability to change one's own point of view, to look at the object of research from different angles. Naturally, if you look at the same object from different points of view, you will necessarily see something that escapes from the traditional view and is often not noticed by others. For this, the following exercises were performed:

- Continue the unfinished story;
- Compose the story on behalf of another character (imagine that you for a while became a diary in Masha's schoolbag, a pebble on the road);
- Describe one day of your imaginary life or use this ending (... the bell rang and Dima continued to stand at the board; ... and the hare peacefully fell asleep on Olya's hands);
- Determine how many values the object has (find as many options of unconventional as possible, but with a real use, for example, a brick, a newspaper, a piece of chalk);
- Name as many features of the subject as possible (for example, a table, a house, an airplane, a book, etc.).

Following the identification of the problem, a solution is sought. Therefore, further, we learn to put forward a hypothesis, i.e. to build assumptions. In this process, the originality and flexibility of thinking, productivity and also personal qualities such as determination and courage are required. Hypotheses are born as a result of logical reasoning and as a result of intellectual thinking. The more events a hypothesis can anticipate, the more value it has. Initially, the hypothesis is not true and not false - it is simply not defined [18].

"The cognition begins with surprise to what is common", - said the ancient Greeks. Hypotheses (or hypothesis) arise as possible solutions to the problem. These hypotheses are then tested in the course of the study. The construction of hypotheses is the basis of research, creative thinking.

In the ability to work out hypotheses I use the following exercise:

- Let's think together why in the summer the snow does not melt in the mountains; Why many children love computer games, etc.;

Making assumptions, we usually use the following words: let's suppose, let's assume, perhaps, maybe, etc.

Another important skill for research is the ability to ask questions. After all, any knowledge begins with a question. To do this, we use the following exercises: we show pictures of people and animals and ask them questions. Another task, what questions will help you learn something new about the subject lying on the table?

The game "Find a Wondered Word" (children ask different questions about the same subject, starting with the words "what", "how", "why", "what for").

We prepare children for the fact that the present always continues in the future and therefore we teach them to further questions: what else might interest you in this problem? What else can you offer or do? These questions arouse curiosity, challenge the child's imagination. It is also necessary to teach definitions of concepts. In order to learn to define a concept, we apply relatively simple techniques: description, comparison of our descriptions with the description of the same subjects by classics or classmates, the distinction (for example, spring and autumn are seasons but how they differ), the generalization [19].

The generalization is a logical operation of the transition from the species concept to the generic by discarding the specific feature (attributes) from the content of the species concept. To do this, we use the following task: from the above concepts it is necessary to construct such series in which each subsequent notion would be generic with respect to the previous one.

An important means for developing skills to define is the usual riddles. We look at them not just as fun, but still quite a serious task. The answer to the riddle is its definable part and the formulation is the second half of the definition, its defining part. The compilation and solving of crossword puzzles can also be seen as an exercise in defining concepts.

Also, we learn to classify with children. The research and knowledge of the world are not reduced to the perception of objects and phenomena, their sensory reflection. It involves the isolation in the objects and phenomena of the general essential features. With the help of classification, people not only organize experience into meaningful blocks for them, but also transform specific observations into abstract categories. The classification is the operation of defining concepts for a certain reason for disjoint classes. For example, we offer children a popular task "the fourth superfluous". Subjects are classified according to the main characteristic, by color, shape, etc. The more division, the more productivity of thinking. And this quality is very important in creative activity. To form the latest skills, we use classification tasks with obvious errors. Such tasks allow developing critical thinking, which is very important in research activities [20].

We also learn to observe. In order for the observation to become possible, it is important to have observance - a fusion of mindfulness and thought.

Exercises to develop attention and observation: the first - we put before the children one of their favorite things. We consider this subject together carefully and calmly. Then we propose the children to close their eyes. We remove the object and ask you to recall and name all its details. The next stage of the exercise - we draw the studied thing from memory. Another block of tasks is paired images containing differences. A good opportunity for developing the ability to observe and the ability to analyze visual images is given by tasks with deliberately made mistakes.

With the children, we learn to conduct an experiment - the most important method of research. The most interesting experiments are, of course, experiments with real objects and their properties.

We learn to analyze, distinguish the main and secondary, draw conclusions and deductions.

These and other types of tasks allow us to form the necessary skills to create a research work or project in the third grade. How do we work on this?

The success of the activity largely depends on its precise organization. Under our guidance, a schedule is drawn up for the implementation of the study: the time frame, the scope of work and the stages of its implementation are determined. The meaning of the technology of educational research is to help the student to go through the path of scientific knowledge and to master his algorithm. The pedagogical management of educational research is carried out at all stages of the

work, but most significantly it is at the stage of formulating the topic, objectives, baselines and also in the analysis of project implementation [21].

The topics that we use in our work can be defined in three main groups:

Fantastic - focused on the development of non-existent, fantastic objects and phenomena;

Theoretical - focused on the work of studying and summarizing the facts, materials contained in various sources;

Empirical - the conduct of their own experiments.

We always remember: the topic should be interesting and captivate the child. With her choice, you should not delay. Most children, with the exception of gifted people, do not have constant attachments, their interests are situational. It is necessary to act quickly until the interest is not quenched [22].

The research work is possible and effective on a voluntary basis. Guys worry about a variety of problems. However, the topic should be feasible, that is, it should correspond to the age characteristics of children, its solution should be useful to the participants of the study. With the coincidence of interests among several students organize mini-groups. Individually, or in a formed pair, or in a mini-group, the guys formulate possible topics for future work. Also, the theme should be original, with elements of surprise, singularity.

At all stages of the work, we, the teachers, should clearly realize that the main result expected by us is the development of creative abilities, the acquisition by the child of new knowledge and skills. More precisely, we must bear in mind that in this case we are dealing not with one result, but with at least two. The first thing you can consider is what the child creates with his own head and hands - the layout, the project, the report and that sort of things. The second, the most important, is pedagogical: an experience of independent, creative, research work invaluable in educational attitudes, new knowledge and skills that make up a whole spectrum of mental neoplasms that distinguish the true creator from a simple performer [23].

Both of these results are clearly visible when protecting children's own work. In this regard, the protection of the results takes on special significance. This is a necessary stage of work.

The registration of the research results requires the following demands: the availability of the title page, footnotes, application design. The introduction clearly defines the research objectives, relevance, the degree of study of the topic, a review of the literature. In the main

part, the results of the study are presented in a logical sequence. In conclusion, it is necessary to draw conclusions that should be concise and clear, consistent with goals, objectives, hypothesis [24].

Defense is the crown of research and one of the main stages of training a beginning researcher. The work performed is not just to tell it, like any real research, but it must be protected publicly. In the course of protection, children learn to present the extracted information, face other views on the problem, learn to prove their point of view.

The performed works are reviewed by teachers on methodological associations, where the student can receive advice for improving work. To assess the results and award of diplomas, a jury is formed. It consists of the school administrator, teachers and students, whose projects took prizes in previous competitions. The work evaluates the cognitive value of the topic, the originality and value of the collected material, the structure and logic of the work, the language and style of presentation and answers to questions. The time of presentation of the project is no more than 5-7 minutes. In addition, there are works on nominations: for the most interesting experiment, for the most original topic, for the most brilliant performance, for the most scientific research and so on.

The presentation of works becomes a holiday for schoolchildren, at which children receive an evaluation of their work. The guys say that they feel like real scientists, communicating with each other, finding like-minded people. Students, whose works are most successful, get the right to participate in urban scientific and practical conferences.

It is expedient to start the organization of research activity from the first class.

In the first grade, we used special games and classes in our work to activate the research activities of the child, helping to master the primary skills of conducting independent research.

At the first stage, training sessions were conducted with the class, giving the opportunity to introduce each child to the technique of conducting the study.

Since the first days of school, we are considering research methods, that is, from where you can get information. In the classroom, we practiced asking questions about each other on topics. For this we use the following exercises:

- We show pictures of people and animals and propose to ask them questions.

- I put the subject on the table and ask the question: "What questions will help you learn something new about the subject lying on the table?"
- The game "Find the Wonderful Word". Children ask different questions about the same subject, starting with the words "what", "how", "why", "what for".
- The game "Guess What You Asked". On the card, the question was written: "When does the leaf fall?" The child responds: "Falling leaves occur in autumn". All other children need to guess what the question was.

Then the children faced a problem, the solution of which they had to find in the books. For example, "What is the elephant's trunk for?". Answers to the questions the children could present orally, with the help of their drawings or show an illustration.

In the spring, an observation of a birch branch was made, which was put into the water. Children with the help of the teacher recorded the results. Subsequently, already in the second half of the first class, we conduct a lesson in which we learn how to collect all available information and process it in the same way as scientists do [25].

Our task is to bring the guys to the idea that the set of methods depends on our real capabilities. The more of them, the better and more interesting the work will go. We suggest that children prepare a report on the brown bear. Having determined the sequence of work, we begin to collect the material. Some children work with encyclopedias, others learn information from adults, a third group uses a computer. A lot of information was collected. We come to the conclusion that we need to create a diagram. So with the help of the teacher, the child learns to make short notes, to invent badges, symbols. That, in turn, develops the child's thinking and creative abilities.

In the second grade, it is necessary to work on the formation of skills to see problems, to ask questions, to put forward hypotheses, to define concepts, to classify observations and experiment skills, to draw conclusions and deduction, to structure materials etc. [26].

We offer tasks and exercises for developing the ability to see the problems that we apply in the lessons.

The task: look at the world with other people's eyes. One of the most important properties in identifying problems is the ability to change one's own point of view, to look at the object of research from different angles. To do this, we perform the following exercises:

- Continue the unfinished story;

- Compose the story on behalf of another character (imagine that you became a fish in an aquarium for a while, a flower in a meadow, etc.) "
- Using this ending (... the rain has ended, but people continued to stand under the canopy; ... and Alyosha smiled warmly at his mother ...) continue the story;
- Determine how many values the object has (find as many options as possible of unconventional, but real use, for example, newspapers, rulers);
- Name as many signs of the object (tree, house, cap, book, etc.) as possible.

Following the identification of the problem, a solution is sought. Therefore, further, we learn to put forward a hypothesis, that is, to make assumptions. In this process, originality and flexibility of thinking, productivity and also personal qualities such as determination and courage are required. In the ability to work out hypotheses, we use the following exercise:

- Let's think together why the birds fly south; Why the streets are so called, why we use a cooler, etc.;
- Making assumptions, I suggest using the words: to suppose, to assume, perhaps, maybe, etc.

It is also necessary to teach definitions of concepts. In order to learn to define a concept, we apply relatively simple techniques:

- The comparison of their descriptions with the description of the same subjects by classic scientists or classmates.
- An important means for developing skills to give definitions is the usual riddles. The answer to the riddle is its definable part and the formulation is the second half of the definition, its defining part. In the lessons, we try to make our own riddles.
- Compiling and solving crossword puzzles.

Also, we learn to classify with children.

The classification is the operation of defining concepts for a certain reason for disjoint classes. For example, I offer children a popular task "the fourth, excess". Subjects are classified according to the main characteristic, by color, shape, etc. The more division, the more productivity of thinking. To form the latest skills, we use classification problems with obvious errors. Such tasks allow developing critical thinking, which is very important in research activities [27].

We also learn to observe. Observing a certain phenomenon (for example, air temperature), guys mark the systematic results, compare the information received, make a report, where we formulate the conclusions on the work done.

With the children, we learn to conduct an experiment - the most important of the methods of research. The most interesting experiments are, of course, experiments with real objects and their properties. To conduct a mini-study at the lesson, it is necessary to draw up a clear instruction for children on the tasks, provide the necessary equipment, a table where the results will be recorded. The study is best conducted in a group where the children distribute roles and each is responsible for his small task. Thus, the work will be organized and effective. And, of course, the teacher's help is very important. The presentation of the results is organized in different ways. Perhaps an oral report on the work done and the results. But the most interesting way is the creative representation of the results in the form of a drawing, sign, diagram, etc. For example, when studying the properties of air, the children presented it in the form of figure-signs. Each figure reflects its own property [28].

At all stages of the work, we, the teachers, should clearly realize that the main result expected by us is the development of creative abilities, the acquisition by the child of new knowledge and skills.

In the course of research activities, children develop the following skills:

- **Minded** – the promotion of the idea (the brainstorm), the problematization, goal the setting and formulation of the problem, the hypothesis advancement, the statement of the question (the hypothesis search), the hypothesis formulation, the reasonable choice of method, ways in activity, planning of activity, self-analysis and reflection;
- **Presentation** - the construction of an oral report (message) on the work done, the choice of ways and forms of visual presentation (product) of the results of activities, the production of visual objects, the preparation of a written report on the work done;
- **Communicative** - fluency in information, the ability to clearly answer the question posed and express their ideas and thoughts, interact within the group, find the best option;
- **Search** – to find information on directories, contextual search, in hypertext, on the Internet, the formulation of keywords;

- Information - structuring information, highlighting the main, receiving and transmitting information, presentation in various forms, orderly storage and retrieval.

Thus, it can be argued that the application of the method of research in the lessons is productive. The opening as a unit of training increases cognitive activity, provides creative development of the child in the process of acquiring new knowledge. The use of research activities in the lessons of cognition of the world increases the students' cognitive interest in the subject, topics and creativity. An important point, we believe, is an independent work to acquire knowledge and develop the creative abilities of the child [29].

RESULTS AND DISCUSSION

Experimental studies were conducted according to the plan.

At the beginning of the pilot work, we got acquainted with the object of the study, studied the views and approaches to the problem of the junior schoolchildren's research activity, outlined in the pedagogical literature, analyzed the materials of periodicals and Internet resources and clarified the conditions that would ensure the effectiveness of this process.

At this stage, a plan for the experimental development of the implementation of the system of lessons, as well as extra-curricular activities aimed at developing research skills was considered.

At the first, ascertaining stage, the existing level of the formation of skills of research activities of students in the experimental and control classes with the help of our tasks for students.

The main task of this stage is to establish the initial level characterizing the availability of research skills among students, which, in our opinion, consists of two components: the spontaneous research experience of children obtained in the process of life activity and the experience gained during the first grade.

At this stage, 42 students of 3 "B" and 3 "V" classes were included in the experimental work, where 3 "B" appeared as a pilot class and 3 "V" as a control class.

To identify the effectiveness of the work performed, we singled out the following criteria:

- The practical readiness in the implementation of the study;

- The motivation of educational and research activities;
- The manifestation of creativity in teaching and research activities;
- The independence in the implementation of teaching and research work.

In the experimental 3 "B" class, after the ascertaining cut, it was revealed that, according to the practical readiness in the implementation of the study, 4 people have a high level, which is 19.1% of the students, the average level is observed in 3 people, which is 14.3%, the low level - 14 people, which is 66.6% of students.

A high level of motivation for teaching and research activities was observed by 7 people, which amounted to 33.3% of students, the average level was observed in 3 people, which was 14.3% of students, a low level - 11 people, which amounted to 52.4% of students.

A high level of creativity in this class is observed in 3 people, which is 14.3% of students, the average level was registered in 7 people, which amounted to 33.3% of students, a low level - 11 people, which amounted to 52.4% of students.

A high level of independence in the implementation of teaching and research work is observed in 3 people, which is 14.3% of students, the average level was observed in 4 people, which amounted to 19.1% of students, a low level - 14 people, which amounted to 66.6% of students.

In the control 3 "V" class, after the first cut, it was revealed that 4 persons were at a high level in practical readiness to implement the study, which is 19.1% of students, the average level is observed in 3 people, which is 14.3% of students, a low level - 14 people, which is 66.6% of students.

A high level of motivation for teaching and research activities was observed by 7 people, which amounted to 33.3% of students, the average level was observed in 3 people, which was 14.3% of students, a low level - 11 people, which amounted to 52.4% of students.

A high level of creativity in this class is observed in 3 people, which is 14.3% of students, the average level was registered in 7 people, which amounted to 33.3% of students, a low level - 11 people, which amounted to 52.4% of students.

A high level of independence in the implementation of teaching and research work is observed in 3 people, which is 14.3% of students, the average level was observed in 4 people, which amounted to 19.1% of students, a low level - 14 people, which amounted to 66.6% of students.

Table 2: Levels of the development of students' research skills in the experimental and control classes according to the results of the ascertaining experiment

Criterion / stages	The practical readiness in %			The motivation in %			The creativity in %			The independence in %		
	B	C	H	B	C	H	B	C	H	B	C	H
Stating 3 "B" - experimental	19.1	14.3	66.3	33.3	14.3	52.4	14.3	33.3	52.4	14.3	19.1	66.6
Stating 3 «V»- control.	19.1	14.3	66.3	33.3	14.3	52.4	14.3	33.3	52.4	14.3	19.1	66.6

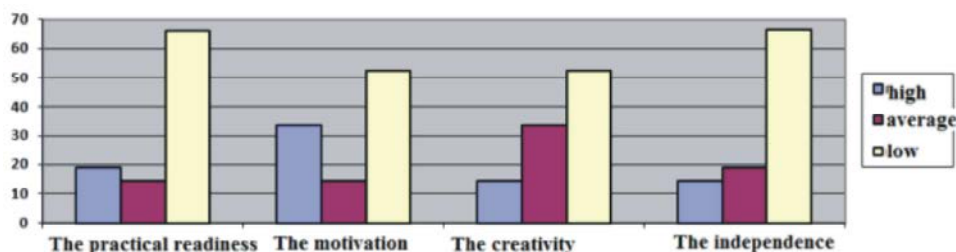


Fig. 1: The diagram of the formation of schoolchildren's research abilities of the experimental and control classes as a result of ascertaining experiment

The forming part of the experiment proceeded along such sections of the program as "Winter Changes in Nature", "Nature and Us", "Let's Save Air and Water, Minerals and Soil!"

When reading the topics of the section "Winter Changes in Nature", the following types of work were applied:

- Reading of art texts of cognitive nature on the topic "Birds in winter";
- Rebuses on the topic "Wild animals";
- Puzzles on the themes "Birds in winter" and "Protection and consolidation of health in winter".
- The didactic game "Who is superfluous here?"

It was used in the consolidation of knowledge:

- Crosswords on the themes: "Plants in winter", "Wild animals in winter".
- Didactic games "Forest Telephone", "Who is here unnecessary?"
- Problematic issues on the themes: "Plants in winter" and "Birds in winter" and a problem assignment on the themes "Birds in winter", "Wild animals in winter";
- The connection of the material with the surrounding reality, reliance on observations and personal experiences of children;
- The work on individual cards on all topics of the section.

In the generalization of knowledge applied:

- a crossword;
- a riddle;
- reading of the artistic cognitive text;
- a didactic game "On the pages of "Zimushka-Zima" magazine";
- drawing up a scheme that makes it possible to understand the cause-effect relationships of winter changes in nature;
- the work with illustrations.

In the lessons of familiarization with the topics of the section "Let's save air and water, minerals and soil!" the following types of work were used:

- experiments on the themes "Bodies, substances, particles", "Air and its protection", "Water and its properties", "Water transformation".
- didactic games "The body or substances, " "What thermometer is needed?"
- the work with the thermometer model;
- tables and diagrams on the themes "Water and its properties", "Water transformation".
- the game story "The Tale of the transformation of a droplet";
- educational material on the topics: "Water and its properties", "The transformation of water";
- with the consolidation of knowledge used: crosswords on the topics "Water and its properties";
- punch cards on the topics "Temperature and thermometer", "Air and its protection", "Water conversion";
- working with a thermometer model;
- the individual work on the topic: "Bodies, substances, particles".

In the generalization of knowledge in the section "Nature and Us" we used:

- The crossword;
- The game story.

In the lesson "Birds in the winter" we used listening and analyzing "overheard conversations" between the birds. Stories N. Sladkov helped in an interesting way to introduce the students to the educational material.

Such forms of entertaining material as puzzles and riddles are easily linked with the theme of a particular lesson and pursue the tasks of broadening the horizon, activating the cognitive activity of students and increasing work capacity. In the lesson of acquaintance with the life of wild animals, puzzles were used in winter. The children solved the puzzle and found out which animal was going to be talked about. Riddles were used in lessons "Birds in the winter", "Protection and promotion of health", they also entered into many crossword puzzles.

Entertaining forms of verification of the factual material assimilation can revive the survey and activate in this process the work of students. Among them are crosswords. In the game, everyone wants to be a winner. However, those students who win faster can reproduce the material studied.

The possibility of free choice at the answer is offered by the didactic game "A Forest Telephone". The child dials the number of the forest house and tells about its owner, about how he hibernates, what he eats at this time of the year. This form of reproduction of educational material does not reduce interest in the subject because it is brought to the simple text of the textbook.

The tasks of activating the educational and cognitive activity of students were also problematic questions and assignments aimed at developing the ability of students to apply knowledge about nature in a new situation.

When the material was repeated, the students' independent work was often used. At this stage of the work, a big role was played by punched cards, cards for individual independent work. Such cards are designed for a different level of knowledge of students.

To create the right ideas about objects and phenomena that are inaccessible to direct perception, pictures, tables, maps, pictures, screen aids are used. Visual aids help to systematize and generalize knowledge, to activate the mental activity of students. In practice, we used various types of visual clarity: figurative paintings, postcards, tables with images of plants and animals, models; and conditional - schemes, tables, maps.

In the formation of ideas and concepts about nature in the complex, a general lesson occupies a special place. This lesson was conducted at the end of the study of the section "Winter Changes in Nature". In order to establish the cause-effect relationships that occur in the nature of the changes, we began work with a generalization of the results of the students' personal observations, recorded in the class calendar of nature and work. According to this calendar, students determine the duration of the day, the temperature regime of the air, the state of the sky, the precipitation. On the basis of these data, children make a brief description of the time of the year, etc. In this lesson we used a variety of means to activate the educational and cognitive activity of students: reading the artistic cognitive text "What is snow for?" of N. Dmitriev, puzzles, crosswords, a didactic game "The pages of the magazine "Zimushka – Zima" ", etc.

The lessons used means of activating the educational and cognitive activities of schoolchildren, such as:

- the content of educational material;
- the use of entertaining material;
- didactic games;
- problem questions and tasks;
- Experiments and practical tasks;
- visual aids;
- the independent work of students.

Criteria for assessing students' knowledge in the lessons of cognition of the world:

- high - if the child can reproduce the knowledge on the 5th day after studying the topic;
- average - if the pupil reproduces them on day 2;
- low - if reproduced for 1 day, after acquaintance with the topic.

The mobility describes the result of the further transformation of knowledge in the process of their application in various learning situations. A high level of mobility is characteristic for students performing complex tasks on the topic studied. The average level is for those who cope with tasks of medium complexity. Low – for the guys who solve simple tasks.

The meaningfulness describes the result of understanding a complete generalized and systematized knowledge.

The level of the formation of skills is determined by such indicators as accuracy, speed, independence.

The accuracy is the ability to perform a certain type of tasks without errors. There are 3 levels of accuracy:

- High - no errors;
- Medium - 1-2 minor errors;
- Low - 3 or more errors.

The speed describes the performance of an action in a minimum period of time. Separately, the time of the first and last completed task is recorded. This time period is divided into 3 parts. Children who completed the assignment within a minimum period, have a high level of speed; For the maximum period of time - low level. The rest have an average speed level.

Self-sufficiency is the ability to perform actions without relying on outside help. There are 3 levels of formation of this indicator:

- High - performing tasks without the help of a teacher;
- Medium - the need for a small hint;
- Low - the task is completed with the help of the teacher.

At the initial and final stages of the practice, control sections of knowledge of the world for a given period were conducted.

If the student gave the right answers in all the polls, this is a high level of strength. The presence of 30% of errors in the last cut and the error-free performance of the first is the average level. The low level - 50% of errors.

The cut, conducted after studying the themes: "Plants in winter" and "Birds in winter", consisted of 3 tasks of varying complexity. With his help, the level of mobility of knowledge and accuracy, speed, independence of skills was revealed.

If all tasks are fulfilled - a high level of mobility. Medium - if 1 and 2 tasks are executed without errors or all tasks are error-free or all tasks with 1 or 2 errors. Low level - 1 task without errors or all tasks with 2-3 serious errors. The accuracy of the execution was determined with the help of the first task. High level - no errors; Average - the presence of one serious or 1-2 minor errors; Low - 2-3 serious, based on ignorance of program material, errors.

On the basis of the cuts that characterize the levels of indicators of the given criteria, it is possible to determine the total final level of the formation of knowledge and skills on certain topics of natural history. This, in turn, is necessary to confirm the formation of the cognitive activity of the students in the class.

Knowing the levels of students' claims it is possible to determine a technique for detecting cognitive activity.

They can be defined in the following way:

14 numbered envelopes are decomposed on the table in ascending order, in them cards with the same difficulty in assignments.

The pupil is given a setting that the task's complexity grows from 1 to 14, i.e. the easiest is the first task, the most difficult is in the envelope under the number 14. This choice is judged on the level of his claims for cognitive activity.

In general, the level of the knowledge of the world increased: at a high level from 35% to 46.5%; On average decreased from 55% to 50%; At a low - from 11.5% to 3.5%.

The formation of skills at a high level rose from 21.5% to 43.5% on average dropped from 61.5% to 50%; At a low from 16.5% to 6.5%.

The initial section, conducted to identify the level of the formation of cognitive activity, gave the following results:

- High level - 3 people - 15%;
- Average level - 12 people - 60%;
- Low level - 5 people - 25%.

The final cut revealed the level of cognitive activity: high - 6 people (30%), middle - 12 people (60%), low level decreased from 10.4% to 6.4%.

The initial section, carried out to reveal the level of formation, cognitive activity, gave the following results:

- high level - 7 people - 28%;
- medium level - 16 people - 64%;
- low level - 2 people - 8%.

The final cut revealed the level of cognitive activity high in 15 people (60%), i.e. In addition to the 7 previous ones in 8 children, it rose from middle to high.

Thus, the level of cognitive activity as a whole increased by 30%.

With the help of school psychologists, we investigated the level of development of the students' thinking processes at the beginning and at the end of the experiment. The results of the studies are shown in the table.

According to the table, we see how the percentage of students with a high level of attention, logical thinking has increased noticeably and there are no students with a low development index of thought processes.

In the control 3 "B" class, after the formulating stage of the study, it was revealed that, according to practical readiness, 7 people had a high level of implementation of

the study, which amounted to 33.3% of students, the average level was observed in 6 people, which amounted to 28.6%, a low level - in 8 people, which was 38.1% of students.

A high level of motivation for teaching and research activities was observed by 8 people, which amounted to 38.1% of students, the average level was observed in 5 people, which amounted to 23.8% of students, a low level - 8 people, which amounted to 38.1% of students.

A high level of creativity in this class is observed in 5 people, which is 23.8% of pupils, the average level was observed in 8 people, which amounted to 38.1% of students, a low level of 8 people, which amounted to 38.1% of students

A high level of independence in the implementation of teaching and research work is observed in 5 people, which is 23.8% of students, the average level was observed in 8 people, which amounted to 38.1% of students, the low level - 8 people, which amounted to 38.1% of students.

In the experimental 3 "B" class, after the first cut, it was revealed that, according to the practical readiness in the implementation of the study, 4 people had a high level, which is 19.1% of the students, the average level is observed in 3 people, which is 14.3%, the low level - 14 people, which is 66.6% of students.

A high level of motivation for teaching and research activities was observed by 7 people, which amounted to 33.3% of students, the average level was observed in 3 people, which was 14.3% of students, a low level - 11 people, which amounted to 52.4% of students.

A high level of creativity in this class is observed in 3 people, which is 14.3% of students, the average level was registered in 7 people, which amounted to 33.3% of students, the low level - 11 people, which amounted to 52.4% of students.

A high level of independence in the implementation of teaching and research work is observed in 3 people, which is 14.3% of students, the average level was observed in 4 people, which amounted to 19.1% of students, low level - 14 people, which amounted to 66.6% of students.

An analysis of the changes in the levels of development of students' research skills in the experimental class (Figure 2).

An analysis of the change in the levels of development of students' research skills in the control class (Figure 3).

The repeated diagnosis of the level of development of junior schoolchildren's research skills showed that it

significantly increased in the students involved in research activities, compared with those students who did not engage in this activity.

In the experimental 3 "B" class, after the control cut, it was revealed that, according to practical readiness, 10 people had a high level of implementation of the study, which amounted to 47.6% of students, the average level was observed in 6 people, which was 28.6% of students, the low level - 5 people, which amounted to 23.8% of students.

A high level of motivation for teaching and research activities was observed by 11 people, which amounted to 52.3% of students, the average level was observed in 7 people, which amounted to 33.3% of students, a low level - in 3 people, which amounted to 14.4% of students.

A high level of creativity in this class is observed in 7 people, which is 33.3% of students, the average level was registered in 9 people, which amounted to 42.9% of students, a low level - 5 people, which amounted to 23.8% of students

A high level of independence in the implementation of educational and research work is observed in 7 people, which is 33.3% of students, the average level was registered in 9 people, which amounted to 42.9% of students, a low level - 5 people, which amounted to 23.8% of students.

In the control class 3 "B" class, after the control cut, it was revealed that 4 people are at a high level of practical readiness to implement the study, which is 19.1% of students, the average level is observed in 3 people, which is 14.3% of students, a low level - 14 people, which is 66.6% of students.

A high level of motivation for teaching and research activities was observed by 7 people, which amounted to 33.3% of students, the average level was observed in 3 people, which was 14.3% of students, a low level - 11 people, which amounted to 52.4% of students.

A high level of creativity in this class is observed in 3 people, which is 14.3% of students, the average level was registered in 7 people, which amounted to 33.3% of students, low level - 11 people, which amounted to 52.4% of students.

A high level of independence in the implementation of teaching and research work is observed in 3 people, which is 14.3% of students, the average level was observed in 4 people, which amounted to 19.1% of students, low level - 14 people, which amounted to 66.6% of students.

Table 3: Results of studies on the development of mental processes in the formative stage of the experiment

Class	Attention %			Auditory memory %			Logical thinking %		
	High	Average	Low	High	Average	Low	High	Average	Low
1 st stage	50	33	16	20	72	8	20	50	29
2 nd stage	75	25	0	23	75	5	64	36	0

Table 4: Levels of the development of research skills of students in the experimental and control classes based on the results of the intermediate section

Criterion / stages	The practical readiness in %			The motivation in %			The creativity in %			The independence in %		
	B	C	H	B	C	H	B	C	H	B	C	H
Forming 3 «B» - experimental	33.3	28.6	38.1	38.1	23.8	38.1	23.8	38.1	38.1	23.8	38.1	38.1
Forming 3 «V» - Control	19.1	14.3	66.3	33.3	14.3	52.4	14.3	33.3	52.4	14.3	19.1	66.6

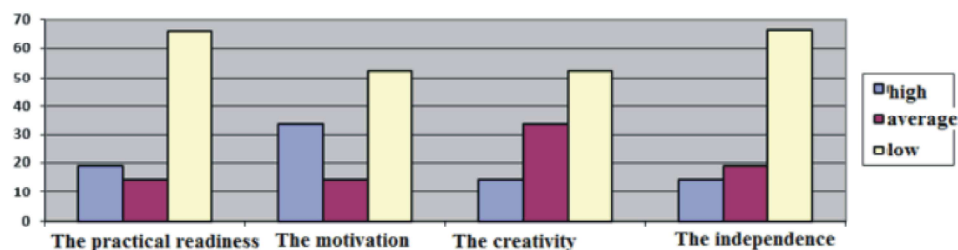


Fig. 2: Levels of the development of students' research skills in the experimental class

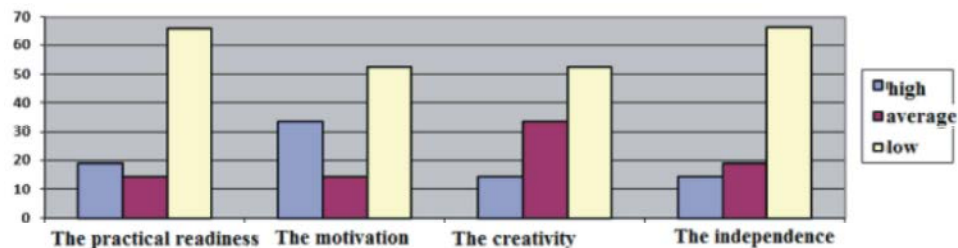


Fig. 3: Levels of formation of students' research skills in the control class

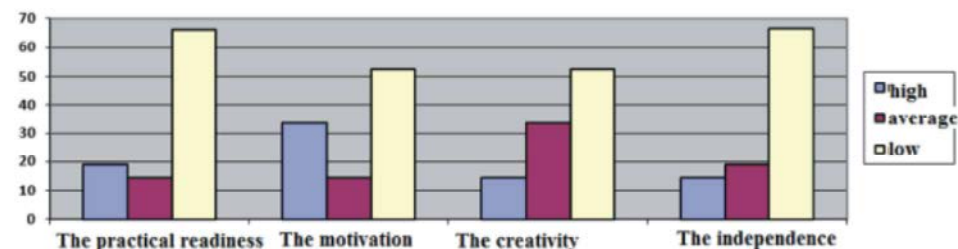


Fig. 4: Levels of formation of students' research skills in the experimental class

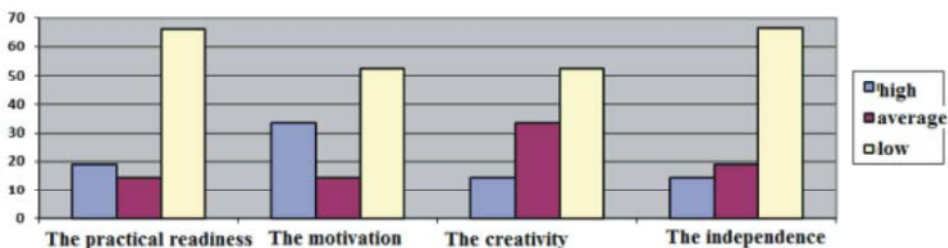


Fig. 5: Change in levels of development of students' research skills in the control class

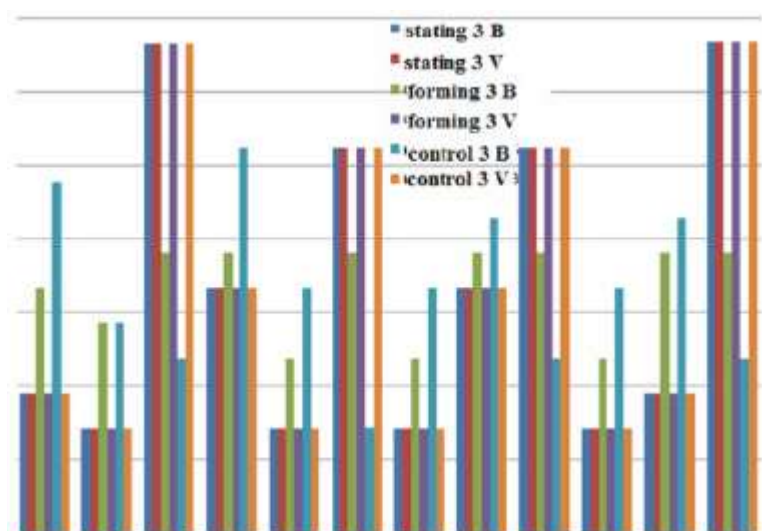


Fig. 6: The comparative diagram of levels of the formation of students' research skills in the experimental and control classes of the stating, forming, control stages

Table 5: Levels of the development of students' research skills in the experimental and control classes based on the results of the control section

Criterion / stages	The practical readiness in %			The motivation in %			The creativity in %			The independence in %		
	B	C	H	B	C	H	B	C	H	B	C	H
Control 3 «B» - experimental	47.6	28.6	23.8	52.3	33.3	14.4	33.3	42.9	23.8	33.3	42.9	23.8
Control 3 «V» -control.	19.1	14.3	66.3	33.3	14.3	52.4	14.3	33.3	52.4	14.3	19.1	66.6

Table 6: Levels of development of students' research skills in the experimental and control classes

Criterion / stages	The practical readiness in %			The motivation in %			The creativity in %			The independence in %		
	B	C	H	B	C	H	B	C	H	B	C	H
Stating 3«B» - experimental	19.1	14.3	66.3	33.3	14.3	52.4	14.3	33.3	52.4	14.3	19.1	66.6
Stating 3 «V»-control	19.1	14.3	66.3	33.3	14.3	52.4	14.3	33.3	52.4	14.3	19.1	66.6
Forming 3 «B»-experimental	33.3	28.6	38.1	38.1	23.8	38.1	23.8	38.1	38.1	23.8	38.1	38.1
Forming 3 «V» -control	19.1	14.3	66.3	33.3	14.3	52.4	14.3	33.3	52.4	14.3	19.1	66.6
Control 3 «B» - experimental	47.6	28.6	23.8	52.3	33.3	14.4	33.3	42.9	23.8	33.3	42.9	23.8
Control 3 «V» -control	19.1	14.3	66.3	33.3	14.3	52.4	14.3	33.3	52.4	14.3	19.1	66.6

An analysis of changes in the levels of development of students' research skills in the experimental class (Figure 4).

An analysis of the change in the levels of formation of students' research skills in the control class (Figure 5).

The analysis of the levels of the development of students' research skills in the experimental and control classes of the stating, forming, control stages (Figure 6).

As can be seen from the table, the quality of the development of the skills of research activity is higher in the experimental class, which confirms the hypothesis of our research.

CONCLUSION

The obtained data confirm: the creation of a scientific and methodological base for organizing the research activity of junior schoolchildren, the inclusion of parents of junior schoolchildren in joint research activities with children, influence the quality of the organization of research activities of junior schoolchildren.

Thus, initiation of research activities should begin at a younger school age, when the process of forming research skills rests on such psychological and physiological characteristics of this age as a holistic view of the world, innate curiosity and emotional susceptibility.

The analysis showed that the levels of formation of students' research skills are the same.

In the second phase of the study in an experimental 3 "B" class, we had a formative experiment, comprising carrying out the lessons of the system and extracurricular activities aimed at the development of research skills.

The technology of work at this stage of the experiment provides for the following types of pedagogical interaction between the teacher, schoolchildren and parents: classes within the framework of the special course "Research Activities in Primary School", organization of educational studies of children, counseling of students, organization of children's conferences and other forms of presentation of research results, diagnostic procedures aimed at determining the level of formation of research skills, explanatory work of the teacher with the parents of students in the experimental classes, in which the educational research was conducted.

The acquisition of educational and research activities was realized through the introduction of problem and search situations and training methods into lessons on the knowledge of the world, based on the activity method described by V.V. Davydov, according to which the search and discovery of new knowledge in the lesson corresponds to the stages of the study.

Special classes were held within the framework of the special course "Research Activities" (the content of the classes consists of the five blocks of research skills of junior schoolchildren), where students mastered the knowledge and ideas on research activities, carried out assignments aimed at developing research skills, implemented their individual studies. We have developed the teaching and methodological support for the course: algorithms and memos for work on the study, diagnostic procedures, types of teaching and research assignments and methodological recommendations for conducting classes.

In the second grade, students received a general idea of research activities, got acquainted with the basic concepts, learned to determine the properties of objects, to observe, to describe, to work with educational text, to perform logical and creative tasks. In the third grade, we began to use methods of research at an accessible level (the observation and description, the comparison, the measurement, the questioning), to formulate definitions and conclusions, to see the main idea in the text and to briefly outline it, to prepare a report, to pass all the stages

of the study from the definition of the topic, problems, goals, tasks of the study before preparation of the presentation, to use schedules, tables, models, schemes in the work.

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