

FORMATION OF COGNITIVE ABILITIES OF JUNIOR SCHOOL CHILDREN BASED ON INTERDISCIPLINARY CONNECTION

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Abstract

Purpose: In the article, the authors reviewed a number of methods for the formation of cognitive processes of children of primary school age. The main emphasis is placed on the disclosure of the essence and role of interdisciplinary connection as one of the main means of forming the cognitive abilities of junior school children since the problem of interdisciplinary connection in education now attracts increasing attention of scientists and practical teachers.

Methodology: The history of pedagogy has accumulated a valuable heritage on the theory and practice of interdisciplinary connections, namely: an objective need to reflect the real relationship of objects and phenomena of nature and society in the educational cognition was formed (from the standpoint of pedagogy, methodology, psychology); ideological and developmental functions of interdisciplinary connections, their positive influence on the formation of a true system of scientific knowledge and the general mental development of the pupil were distinguished; method of coordinated teaching in various academic subjects was developed, attempts were made to prepare the teacher for the implementation of interdisciplinary connections in practice.

Result: The existing subject system of education, including primary grades, presupposes an autonomous consideration of individual aspects of reality and orients pupils towards the private assimilation of knowledge in one or another particular area that are weakly interconnected. Also, the article presents the opinions and definitions of scientists on the formation and development of children's cognitive processes, which allowed identifying a number of controversies, which were the prerequisites for research.

Applications: This research can be used for universities, teachers, and students.

Novelty/Originality: In this research, the model of formation of the cognitive abilities of junior schoolchildren based on interdisciplinary connection is presented in a comprehensive and complete manner.

Keywords: *cognitive process, formation, primary school age, interdisciplinary connection, mental development.*

INTRODUCTION

Cognitive abilities are defined as individual psychological characteristics of a person (that is, qualities that distinguish one person from another), which are a condition for the successful implementation of educational and cognitive activity. In philosophy, cognitive abilities are understood as sources of knowledge; they represent natural means of knowledge, which are the individual qualities of a person. Cognitive abilities include sensations, conceptualization, perceptions, mind, will, intellect, talent, intuition, memory, imagination, deduction, induction, analogy, analysis, synthesis. The variety of types of cognitive abilities suggests that there are no main abilities among them, regardless of the specific goal of knowledge. Focusing on those or other cognitive abilities is predetermined by the goals and objectives of cognitive activity, and it is complicated depending on the cognitive tasks to be solved. Cognitive abilities have a different character: it can be scientific and commonplace, carried out in the natural, humanitarian and technical sciences; it can be theoretical and experimental, etc. (Rusniati, Pendidikan 2015). Teaching children should be based both on the internal capabilities of the child and on the external possibilities of the educational environment, where, through purposeful actions of the teacher, the development of mental processes, the formation of general intellectual skills and holistic formation of personality is ensured.

Professor L.V. Venger and the staff of his laboratory investigated the basic laws of the development of the child's cognitive abilities - sensory, intellectual, and creative.

Based on the research of many scientists (Sujarwo, Reorientasi 2006) we have identified the most important components of mental development, ensuring the formation of cognitive abilities of pupils of primary school age: memory, thinking, attention, imagination, perception, interest. Together they constitute the basis for successful learning and intellectual development. The process of formation of cognitive abilities in pupils of primary school age takes place most successfully in an organized, focused learning. As criteria for the formation of cognitive abilities of pupils of primary school age, we have identified:

- Independent thinking;
- Speed and strength of learning;

- Quick orientation when solving non-standard tasks;
- The ability to distinguish the essential from the non-essential;
- Different level of analytical and synthetic activities;
- Flexibility and criticality of mind;
- Focus on the subject matter;
- Freedom and erudition.

Formation of cognitive abilities of pupils of primary school age is an extremely important condition for the rapid and high-quality acquisition, the firm consolidation and the effective use of knowledge and skills in practice.

METHODS

The history of pedagogy has accumulated a valuable heritage on the theory and practice of interdisciplinary connections, namely:

- An objective need to reflect the real relationship of objects and phenomena of nature and society in the educational cognition was formed (from the standpoint of pedagogy, methodology, psychology);
- Ideological and developmental functions of interdisciplinary connections, their positive influence on the formation of a true system of scientific knowledge and the general mental development of the pupil were distinguished;
- Method of coordinated teaching in various academic subjects was developed, attempts were made to prepare the teacher for the implementation of interdisciplinary connections in practice.

The use of interdisciplinary communication in the process of learning allows solving important and complex tasks facing the modern school - the formation of cognitive abilities, improving the efficiency of knowledge, forming a holistic picture of the world among pupils. The methodological basis for the use of interdisciplinary connections is an integrated approach to the study of educational material, the theoretical basis of which is the philosophical law on the relationship and interdependence of phenomena and processes. The scientific importance of interdisciplinary connections and an integrated approach stems from the modern understanding of the essence of natural science, which is a complex system that includes many scientific disciplines. This means that the mutual penetration of the sciences reflects the objective dialectic of nature and indicates that nature is basically universal. No part of nature is isolated but is in a common dialectical connection. This is the meaning of the basic philosophical thesis "Everything interacts with everything". And if in the world of science, the interconnection of various sciences is naturally carried out, then in the educational process this synthesizing role is played by interdisciplinary connections. Based on these ideas, many educators have made a significant contribution to solving the problem of interdisciplinary communication in the learning process. M. Danilov, B.P. Yessipov and many others, along with theoretical substantiations, gave a number of specific recommendations for deepening and expanding the interconnections of academic disciplines in school ([Ameen, Ahmed & Hafez, 2018](#); [Yazdekhasti Erfan & Nazari, 2015](#)).

Today, interdisciplinary connections for the development of pupils' motor, experimental, visual and labor skills are distinguished.

The methodological significance of the use of interdisciplinary communication in the formation of the cognitive abilities of pupils of primary school age is that it is one of the basic principles of learning that should be taken into account. The principles developed by V.V. Kraevsky were recognized in the pedagogical theory.

- The principle of integration of the content of education in all its elements and at all levels of constructing socio-economic needs;
- The principle of taking into account the content and procedural aspects of the design of educational content, involving the correlation of educational material with the forms, methods, and means of the learning process;
- The principle of structural unity of the content of education at different levels of its formation: theoretical insights, academic subject, educational material, pedagogical activity, pupil's personality.

The variety of functions of interdisciplinary connections in the learning process shows that the essence of this concept cannot be determined unambiguously. They are not limited to the scope of content, methods, forms of organization of learning. Interdisciplinary connections penetrate the learning and cognitive activity of pupils and the teaching activities of teachers. They are addressed to the personality of the pupil, form the dialectical thinking, scientific outlook, beliefs, contributing to the full development of the abilities and needs of the pupil ([Razavi, Nasirian & Afkhami, 2015](#)).

In the tasks of learning it is necessary to reflect the use, development, consolidation, and generalization of the knowledge and skills acquired by pupils in the study of other subjects. In the content of educational material, it is important to highlight issues, the study of which requires reliance on previously acquired (from other subjects) knowledge, as well as questions that will be developed in the subsequent teaching of disciplines. The following table 1 shows the types of

interdisciplinary connections, interdisciplinary cognitive tasks and interdisciplinary generalized competencies, formed in the process of their application.

Table 1: Types of interdisciplinary connections, interdisciplinary cognitive tasks, and interdisciplinary generalized competences

Types of interdisciplinary connections	Interdisciplinary cognitive tasks	Interdisciplinary generalized competences
Factual - the establishment of kinship, analogy of the facts studied in various educational subjects, and their comprehensive consideration in order to form a holistic model of fact.in the minds of pupils	Establishing a connection, common facts from different subjects in order to concretize the material under study, the formation of new concepts, their explanations from the standpoint of general theories, principles, in order to use some facts to explain others.	Establishing a community of facts from different subjects, their comprehensive analysis, comparison and synthesis, explanations from the standpoint of general scientific ideas; the ability to link generalized facts with a general system of knowledge, find and put them into practice, etc.
Conceptual - a phased, element-by-element expansion and deepening of links between specific signs of concepts common to different subjects.	Establishment of connections between concepts from different subjects for the purpose of their concretization, generalization, the formation of a system of concepts of different degrees of generality, their subordination and development, explanation of causal and effect relations of phenomena.	Establishing links between the concepts of different subjects, their concretization, the ability to explain the processes and phenomena of one science with the help of the concepts of another science, to draw worldview outlines on the basis of general concepts; ability to formulate the connection between concepts from different subjects in speech, etc.
Theoretical - an element-by-element increment of new components of general scientific theories from the knowledge gained in the lessons in different subjects with the goal of pupils' understanding of the complete theoretical knowledge system.	Establishing links between theories of different sciences, their points of contact; establishing links between the structural components of general scientific theories; the establishment of links between theoretical knowledge and methods of their cognition; bringing theoretical knowledge into the system, their worldview communication, disclosure of the breadth of the practical application of the theory.	Ability to consider scientific theories as a special case of more general theories; the ability to link the structural elements of general scientific theories into a single whole; the ability, on the basis of the theory of one science, to explain the facts studied by the science adjacent to it; ability to apply theory in practice; ability to connect scientific theory with philosophy
Philosophical - conscious assimilation by pupils of knowledge about the objective laws of the development of nature, society, knowledge on the basis of generalization of specifically subject and philosophical knowledge obtained in the study of subjects of different cycles.	Establishing links between concrete - subject and philosophical knowledge in order to form a scientific - philosophical picture of the world; the establishment of links between scientific concepts and philosophical categories, etc.	The ability to consider subject facts, concepts, theories, laws from the standpoint of universal dialectical laws and categories; the ability to carry out an element-by-element generalization of knowledge from different subjects in the disclosure of the most common signs of the concepts of dialectical and historical materialism, to give a definition of these concepts based on specifically - subject knowledge, etc.
Ideological - element-by-element generalization and conscious assimilation of axiological knowledge obtained by pupils in the study of humanitarian and natural science disciplines in order to form their ideological and moral consciousness.	Assimilation of connections between the elements of axiological knowledge obtained by pupils in the study of various academic subjects; the disclosure of ideological - political and moral - aesthetic aspects of scientific knowledge based on facts, concepts, ideas, images.	The ability to link in a general system the knowledge of different types, different forms of social consciousness and human practice; the ability to navigate in the complex problems of the modern age, their gnostic and axiological aspects, the ability to reveal the points of contact of natural science, humanitarian and technical knowledge.

Reliance on the interdisciplinary connection in the learning process contributes to the formation of a holistic personality with a breadth of ideological vision and integrated knowledge of the world around, who can apply this knowledge to solve educational and other life tasks. The implementation of the principle of interdisciplinary connections gives a general education the integrity that makes it a system. Giving to school subjects the nature of a systematic approach,

interdisciplinary connections generalize knowledge and make the pupils' worldview and their personality complete, i.e. contribute to the creative development of learners.

The theoretical and methodological basis of the study was the concept of L. S. Vygotsky on the cognitive development of children, starting from infancy; the works of V. N. Druzhinin on general and cognitive abilities, the research of A.N. Leontyev on individual abilities, the concept of B. M. Teplov on abilities and talents. When considering the state of the problem being investigated, the following research methods were used: *empirical* - survey, testing, comparative analysis of qualitative characteristics, quantitative data processing; *theoretical* - analysis of pedagogical, psychological literature, comparison, synthesis, and specification.

We used several empirical research methods: survey, testing, comparative analysis of qualitative characteristics, quantitative data processing. These empirical methods are united by the fact that they are aimed at studying the object of research. This requires the collection and systematization of factual material on the state of the educational process, as well as data on the effectiveness of the educational system. Note that for this group the empirical nature of knowledge is inherent, which is an important prerequisite for the reliability of the data obtained. In addition to these methods, in order to conduct a qualitative diagnostic assessment of the formation of the cognitive abilities of pupils of primary school age, we also used other two empirical methods: conversation and the study of the products of activity. They were used taking into account the age characteristics of the object of our study, i.e. pupils of primary school age, the dialogue mode is important for them, they like to lead conversations, they answer the questions asked by the teacher more openly or they actively ask questions, talk, and reflect. But one should not think that the conversation does not have a clear plan or it is conducted spontaneously. When we talk about conversation as a scientific research method, we emphasize that it is conducted according to a clear plan, i.e. it has a goal, open questions are being worked out in advance. Open questions are the main condition for creating a friendly atmosphere during a conversation. The next important condition for the success of the conversation is its individualized character, which is called "one-on-one", i.e. the researcher focuses on respondent's responses. Note that the researcher should be able to stimulate the speech activity of the respondents, but at the same time, without forgetting the research goal. It is direct contact with the respondent that is the strength of the conversation as a method of research, compared with a survey. We would like to highlight some of its advantages, capabilities:

1. *Skillful management of influence on respondent's answers*: third parties; inappropriate environment, lighting, time; intonation in formulating questions, etc. may annoy some respondents, and the researcher, preparing for a conversation in advance, should learn how to manage this conversation process;
2. *Reformulation of questions*: in the course of the survey it becomes clear to the researcher which questions need to be asked differently so that the respondent is comfortable to answer them;
3. *Clarification questions*: for more specific answers;
4. *Non-verbal speech* (gesture, facial expressions, posture, gaze, etc.): during the conversation, it plays an important role in setting a sincere answer to questions;
5. *Understanding of non-verbal speech*: during the conversation, the researcher determines the emotional state of the respondent through his understanding of non-verbal speech.
6. *Communicative competence*: allows expanding or narrowing the range of issues that need to be discussed with the respondent.

The next research method that we used in our work is the study of the products of activity. In this method, the emphasis is on the works developed by the students themselves. As part of our research, these were students' work made in the process of integrated lessons "Technology" (labor) and "Mathematics". In the process of integrated lessons, we set the goal to achieve a high level of formation of cognitive abilities of pupils of primary school age. Therefore, pedagogical research requires this method, which establishes the availability and quantity of the products of an activity (in our context of students). As part of the research objectives, we were able to determine the peculiarities of character peculiar to the personality of pupils of primary school age.

In general, as part of our research, we used the following theoretical research methods: the study of psychological, pedagogical, philosophical sources, theoretical analysis, methods of logical generalizations, and modeling. For us, it was important to study the psychological, educational, philosophical sources, which were a prerequisite for the development of information competence. Finding and selecting the necessary information are the main aspects of information competence. In the context of our study, the subjects of study were the normative documents in the field of education, in particular, the State and subject educational standards of primary education, model curricula and programs, various textbooks on the subject "Technology" (handicrafts) and "Mathematics" in elementary school, as well as various electronic documents.

RESEARCH RESULTS

The results of the diagnostic assessment were a prerequisite for the pedagogical model. In this regard, we used the method of creating and studying scientific and pedagogical models with the help of pedagogical modeling. V.A. Sidorov writes the following: "The scientific and pedagogical model helps to mentally present or materially implement a system that

adequately reflects the subject matter of pedagogical reality. The main advantage of the scientific and pedagogical model is the integrity of the information provided, making it possible to carry out a synthetic approach in the knowledge of this object. Pedagogical modeling helps to comprehend the subject of study in various conditions. For example, the system needs to determine what properties a certain component should possess in order to significantly improve the performance of another component, which is formed as a result of a rather complex process" ([Araújo, Henriques, & Martini, 2018](#); [Novikova, et al. 2018](#); [Kenan, 2018](#)).

Let's try to interpret it in the context of our educational model. The whole system of a pedagogical model consists of the following aspects: the object of study (pupils of primary school age), the connection between the selected components and the subject of research (the development of cognitive abilities of pupils of primary school age through the use of interdisciplinary connection (using the example of "Technology" (handicrafts) and "Mathematics"). For our study, it was important to theoretically develop an optimal system, that is, a system that forms the cognitive abilities of pupils of junior school age. We carried out several stages of the pedagogical experiment to test the effectiveness of the developed model in real conditions of the teaching and pedagogical process in elementary school. The results were generalized by mathematical methods, some of these methods we used successfully. These are the following methods: establishing quantitative dependencies, method for calculating elementary statistics, as well as methods for statistical identification of relationships.

In our work, we also relied on the results of practical research on the learning process. They state the following: changes occurring in modern science and society are aimed at the interconnection of interdisciplinary integrated lessons. Using methods (induction, deduction) of logical generalizations of practical research, we developed the following algorithm for the activities of pupils of junior school age:

1. The initial stage - the acquisition of basic knowledge.
2. Activity stage - simultaneously with mastering the content, the operational side of the educational activity is also carried out. This stage is more practice-oriented, we will see students in the process of educational work, when they, working (individually, in pairs or in a team) perform tasks aimed at updating their knowledge, its application in practice, in the consolidation of the results, i.e. synthesis, as well as evaluation of the developed information. At this stage, through the activities of pupils, we can observe the development of their skills, the formation of habits and competencies.
3. The reflective stage - the stage of thinking, cognitive abilities are improved in conjunction with the evaluative, communicative, organizational, verbal, creative, practical skills, stimulating the motivation of pupils' educational and work activities.

Using a similar algorithm, we were able to trace the dynamics of the development of the formation of the cognitive abilities of pupils of junior school age through the use of interdisciplinary connection (using the example of "Technology" lessons (handicrafts) and "Mathematics").

Thus, the application of scientific methods allows drawing some conclusions. According to S.V. Sidorov, "theoretical and empirical research methods are aimed at improving the course of research". Theoretical research methods helped to analyze philosophical, psychological and pedagogical sources that served as the methodological basis for conducting a pedagogical experiment, especially in terms of comparing, summarizing and specifying data. Empirical methods are more focused on the implementation of the experimental part of the study.

THE DISCUSSION OF THE RESULTS

In accordance with the main objective of the study, as well as to test the pedagogical model, we conducted a pedagogical experiment that covered the following three types of experiments: ascertaining, formative, and control.

The experiment was conducted on the basis of secondary schools 38, 19 of Semey city of the Republic of Kazakhstan. Two groups of pupils of junior school age were taken: **group A - control** (3 "A" class, 4 "D" class) and **group B-experimental** (3 "B" class, 4 "C" class). There are 48 pupils in the A-control group, and 48 pupils in the B-experimental group.

For the ascertaining experiment, we identified the following objectives:

- Develop criteria, indicators, and levels of formation of cognitive abilities of pupils of junior school age;
- Identify cross-cutting thematic lines for the use of interdisciplinary connections (using the examples of the "Technology" (handicraft) and "Mathematics" subjects) in order to develop the cognitive abilities of pupils of primary school age;
- Conduct a diagnostic assessment of the level of formation of cognitive abilities of pupils of primary school age at the beginning of the experiment.

To determine the level of formation of the cognitive abilities of pupils of primary school age, we have developed criteria, indicators, and levels. They are clearly shown in table 2.

Table 2: Criteria, indicators, and levels of formation of cognitive abilities of pupils of primary school age

Criteria	Indicators	Levels		
		High	Middle	Low
Motivational and value	Understanding the use of interdisciplinary connections, interest, causes, value orientations in the formation of cognitive abilities	Pupil independently performs the tasks of the teacher, does not hesitate in understanding the relationship between concepts, can always offer his opinion.	Pupil performs tasks under the guidance of a teacher, he finds it hard to understand connection between concepts, and in some cases, he can offer his opinion.	Pupil performs tasks only under the guidance of a teacher on the basis of a simple generalization; he finds it hard to understand the connection between concepts, his concepts about objects and phenomena of the surrounding reality are scattered.
	Mastering of the relationship between concepts through the use of the interdisciplinary connection is characterized by completeness, volume	Pupil independently learns the characteristics, properties, sides, content, and volume of the subject, work is done on errors, their correction.	At mastering the teacher's help, in self-work the self-doubt is manifested, he works on errors but does not correct them.	At mastering the pupil's activity is characterized by incompleteness, mostly false knowledge, it does not correspond to the truth. He finds it difficult to recognize false knowledge among the drawings, devices, characteristics, in some cases recognizes them.
Operational	Creative work in the defining connections and the relationship of concepts with other concepts, planning, propensity for self-management.	Identifies the main features of concepts, analyzes the difference between essential and non-essential characteristics, determines cause-effect relationships. He understands and performs all operations in changed situations, substantiates each of his activities, and easily establishes connections in the system of basic concepts.	Consciously defines concepts, establishes the connection between concepts in the system with the help of a teacher, but cannot fully define the system of concepts. Determines the relationship and dependence between them in a particular situation, but essential and non-essential characteristics are difficult to determine on their own.	Finds it difficult to establish causal relationships between concepts, in the system of concepts is not consciously able to give definitions, finds it difficult to establish the connection between concepts, does not perform certain operations in turn.

A detailed analysis of the curriculum "Technology" (handicraft) gave the following results: the main didactic purpose of this subject is the formation of knowledge about the relationship between man and the world, the concept of the role of human activity in the development of society and man himself, the basics of technological knowledge and skills. Labour is one of the main factors affecting the development of a pupil's personality (human, mental, physical, aesthetic, economic). Formed skills provide active perception and understanding of the acquired knowledge and skills. The purpose of the school subject "Technology" (handicraft) is the formation of initial technological knowledge, general labor skills, and abilities, abilities of planning and organization of work, education of diligence, respect for people and the results of their work. The following is a review of the use of interdisciplinary connections in the "Technology" subject (handicraft).

Of particular interest to our study is the interdisciplinary connection between the lessons of technology (handicraft) and mathematics, in the course of which the following are formed:

- The child's willingness to work, the ability to apply mathematical knowledge in life, to solve practical problems;
- The skills of using mathematical knowledge and skills for the manufacture of products necessary for everyday use;
- Skills of mathematical accuracy and symmetry for the manufacture of various products and staffing.

P.A. Rasulova, analyzing in detail the state of the practice of interdisciplinary connection, notes the following: “In programs and in textbooks in mathematics for primary classes there are not enough exercises and tasks of a practical nature aimed at developing pupils’ technological knowledge, design and drawing and measuring skills with point of view of effective implementation of interdisciplinary connections in the lessons of technology (handicrafts) and mathematics. Both at the lessons of mathematics and at the lessons of technology (handicrafts), teachers do not pay enough attention to the development and formation of practical skills”.

The results of experimental work on the formation of cognitive abilities of pupils of primary school age indicate the effectiveness of the implementation a pedagogical model developed by us and methods of practice-oriented and developmental education, the main didactic condition of which is the use of interdisciplinary connection aimed at the formation of integrated competences in the application of knowledge on technology (handicrafts) and mathematics in junior school.

The study showed that with the age the task of forming cognitive abilities is becoming more relevant, so the volume and content of the material being studied grow, the number of objects increases, the motivational sphere, and cognitive interests change. To meet the developing needs of pupils in solving cognitive tasks, teachers need to constantly improve their professional level. The more diverse and entertaining the forms and activities of the lesson, the freer and more relaxed the child feels - the more the individual personality traits develop. Entertaining is not only aimed at deepening the study of program material, but also contributes, first of all, to the development of cognitive abilities.

The pedagogical model proposed by us and the method of forming cognitive abilities through the use of interdisciplinary connection of pupils of primary school age has shown its effectiveness. This is evidenced by the results of the control experiment of the study: the level of cognitive ability of pupils of primary school age increased according to the following indicators: thinking, attention, memory, increased interest of teachers and pupils in the use of interdisciplinary connections.

CONCLUSION

The study of scientific and theoretical foundations and features of the formation of cognitive abilities of pupils of primary school age using interdisciplinary communication drawing the following conclusions:

1. The formation of cognitive abilities of pupils of primary school age ensures in many respects their success not only in learning and cognitive activity but also in the whole further life path. Modernization of modern education in the Republic of Kazakhstan urgently requires the search for new directions for improving education in primary school. One of such important ways is the formation of the cognitive ability of pupils of primary school age through the use of interdisciplinary connections (for example, the subjects of “Technology” (handicraft) and “Mathematics”).
2. The use of interdisciplinary connection contributes to the holistic perception of the phenomena of the surrounding reality and the disciplines under study. The interdisciplinary connection is a concrete expression of processes that not only at a qualitatively new level solve the problems of learning, development, education of pupils, but also lay the foundation for a comprehensive vision, approach, and solution of complex problems of reality. The need for application in the educational process of multilateral interdisciplinary connections is dictated by the need, the social order of society in graduates who possess a set of key competencies. Therefore, the use of interdisciplinary connections, starting with the lessons of elementary school, is an important condition and result of an integrated approach.
3. The pedagogical model created by us, which consisted of interconnected blocks: goal-setting unit (goal, objectives, principles), informative (on the example of the subjects “Technology” (handicraft) and “Mathematics”), procedural-technological (organizational conditions, technologies, forms and means) and evaluative and effective (criteria, levels and their indicators) contributed to the formation of cognitive abilities of pupils of junior school age in the use of interdisciplinary connections.
4. Experimental work confirmed the effectiveness of the implementation of the pedagogical model. As a result of training with the use of practice-oriented and developing gaming technologies in the experimental classes, there were noticeable changes in the formation of cognitive abilities compared with the control classes. The level of formation of cognitive abilities and their growth among pupils of primary school age in the experimental group averages 2.65% versus 6.3%.

All this testifies to the positive effect of the use of interdisciplinary connections to increase the level of formation of the cognitive abilities of pupils of primary school age. The results obtained during the study deepen the understanding of the essence of activating the cognitive abilities of pupils, broaden their understanding of possible ways and means of enhancing the educational and cognitive activity of junior schoolchildren.

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