

# REPUBLIC OF AZERBAIJAN

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## ABSTRACT

of the dissertation for the degree of Doctor of Philosophy

### SYSTEM OF WORK OF THE SUBJECTS INTEGRATION IN PRIMARY CLASSES

Speciality: 5804.01 – General pedagogy, history of pedagogy and education

Field of science: Pedagogy

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**Nakhchivan – 2022**

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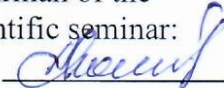
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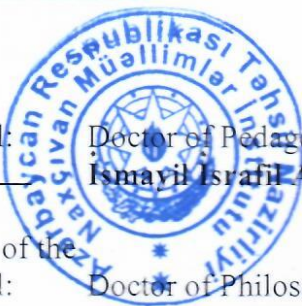
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## GENERAL DESCRIPTION OF THE WORK

**Relevance of the topic.** The processes associated with the reform of education make high demands on pedagogy and its important part - didactics. Currently, the main focus of these requirements is the creation of theoretical and practical foundations for the reconstruction and effective functioning of pedagogical systems.

There are many unresolved problems in the field of pedagogical science, which are still not resolved in the direction of creating effective didactic systems. These issues should be based on the use of such forms and teaching methods that will deepen intensive scientific knowledge, which can increase the level of independent functioning of schoolchildren and provide knowledge, skills and habits that will help them develop effective personalities. Scientists and practitioners are constantly working on researching new educational technologies and improving existing pedagogical systems.

In recent years, new problems have appeared in the theory and practice of teaching and integrating natural sciences and the interdependence between nature and social sciences, as well as purely didactic problems of both theoretical and practical nature.

Importance of solving the problem of integrating academic disciplines is enhanced by strengthening methodological and global perspectives in training and education<sup>1</sup>.

The multidisciplinary approach to teaching reflects a holistic approach to teaching and learning, which allows us to consider it as a key element of the content of education and at the same time as a link between the subjects.

It should be noted, that the problem of interdisciplinary communication is not a new problem for pedagogy. Importance of its solution in the differentiation and integration of scientific knowledge is based on philosophical views at all times, at one stage or another of social development. The use of interdisciplinary relations in the educational process at different times was put forward by such

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<sup>1</sup> Azərbaycan Respublikasının Təhsil Haqqında Qanunu. – Bakı: Hüquq ədəbiyyatı nəşriyyatı, – 2010. – 80 s. / <http://www.e-qanun.az>

scientists as Y.A. Komensky, D. Lolk, I. Herbart, A. Disterverg, K.D. Ushinsky, M.M. Mehdizadeh and etc.

Comprehensive educational programs of the 20s are of particular interest at the expense of this problem. The introduction of the first stage of this program notes: “A distinctive feature of the new program is the implementation of the integrated method. The essence of this method is that subjects are not studied in an isolated form, but are focused on central topics... So, for example, the theme “The beginning of winter” is advanced; working on this topic, students learn about the nature and human life of the first winter months - observe, take notes, read, draw, correct and perform mathematical calculations... According to the proposed program, the focus is primarily on how to integrate knowledge from various fields of science - how they can combine knowledge, skills, *sociology*, science, language, art and mathematical skills. In addition to the advantages (interdisciplinary and interdisciplinary relations), there were also serious disadvantages of complex programs (lowering the importance of theoretical knowledge, transferring children's experience, creating interdisciplinary artificial and installation relations, etc.). Therefore, it was replaced by programs that ensure the independence of teaching subjects.

Modern pedagogical literature has more than 30 definitions of the category “interdisciplinary relations”, and there are various approaches to their justification and classification. Many authors as M.M. Mehdizadeh, Z.I. Garalov, P.B. Aliyev, I.I. Aliyev, L.N. Gasimova, P.G. Kulagin, N.A. Loshkareva, V.N. Maksimova, G.F. Fedores, N.V. Fedorova and etc., who expressed their specific views on the content, goals, types and types of interdisciplinary relations were especially involved in the study of this problem.

In our opinion, the most accurate definition of the category “interdisciplinary relations” is the proposal of G.F.Fedores: *“Interdisciplinary communication is a pedagogical category that implements the functions of training, education and development, which are an integral part of the content, form and methods of the*

*educational process, so that to synthesize and integrate relations between objects, events and real world processes”<sup>2</sup>.*

This rule draws attention to the establishment of interdisciplinary relations between different subjects. In this regard, it is noted that different approaches are needed to determine the content, methods and forms of training. Changes in the content and teaching methods, in turn, provide a qualitatively new level of solving problems associated with the education, upbringing and development of primary school students.

Student’s worldview should be based on knowledge that reflects the realities of objective relationships in life and takes into account the constantly growing information capabilities of the world. The effectiveness of information assimilation is achieved only in the process of active work. Therefore, studies aimed at implementing the interdisciplinary integration of students' educational and cognitive activities, as well as the role that these studies play in improving the entire learning process, including primary education, are of particular importance.

At the same time, an analysis of the pedagogical, psychological, and methodological literature on this problem shows, that this issue is being studied more and more in the field of didactics and methods of teaching various subjects in middle and high school. In the didactics and methodology of the elementary grades there are few or no developments, which, in turn, determines the choice of the subject of the current study.

Thus, the relevance of the study is based on the following conditions:

- change in training paradigm and a change in the learning objectives related to the development of continuing education;
- the need to create methodological systems for teaching students to build a consistent world map;
- insufficient development of interdisciplinary integration in the theory and practice of primary education.

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<sup>2</sup> Федорец, Г.Ф. Межпредметные связи в процессе обучения / Г.Ф. Федорец. – Ленинград: ЛГПИ, – 2003, s.61.

**Issue of the research** is search for methodological approaches, means and forms of implementing interdisciplinary integration in primary education.

**Object of the research** is learning process for junior school children.

**Topic of study:** system of interdisciplinary integration into the developing system of education for junior school children.

**The aim of research** is to develop a theoretical justification and development of the main components of the methodological system of developing education that implement the principles of interdisciplinary integration at the level of primary education.

**Research Objectives:**

1. To analyze the psychological, pedagogical and methodological literature in terms of problems in order to determine the degree of development of the research topic.

2. To determine the psychological and pedagogical foundations for the implementation of interdisciplinary integration in the framework of teaching junior school children.

3. Development of the content, forms and methods of organizing education in elementary school, the implementation of the principles of interdisciplinary integration.

4. Testing the effectiveness of the developed methodological system in practice.

**Research hypothesis.** Interdisciplinary integration based on the developmental learning methodology can be significant and realistic if the following conditions are met:

– to form a complete consistent picture (scoreboard) of his youthful world;

– ensure the development of the intellectual interests and abilities of students;

– take into account the dynamics, levels and stages of mental development of primary schoolchildren and the foundations of their development.

**The methodological basis of research.** The methodological basis of the study was the idea of humanization and democratization of education, a holistic systematic approach to the pedagogical

process, the unity of objectivity and subjectivity, the relationship and influence of traditional and innovative education.

**Theoretical basis of the research** in dissertation is the scientific works of prominent Azerbaijani theorists, psychologists and methodologists, as well as representatives of foreign pedagogical and psychological sciences, whose ideas were tested in practice.

**Research methods:** analysis and generalization of pedagogical, psychological and methodological literature on the basis of the studied problem, study and generalization of the system of work of experienced elementary school teachers, testing, questioning, interviewing, interviewing and pedagogical experiment.

**Research** has been conducted **in stages**. **At the first stage** pedagogical, psychological and methodological literature was analyzed, as well as the theoretical foundations of the problem being studied, the corresponding teaching methods and the situation in school practice based on the problem of interdisciplinary integration in primary grades.

**At the second stage** the content of education and the forms of organization of the educational process were implemented, a decisive experiment was carried out that implements the principles of interdisciplinary integration.

**At the third stage** a training experiment was conducted to test the effectiveness of the proposed method, and the results were analyzed and generalized.

**Scientific novelty** of the study is to identify ways to ensure interdisciplinary integration into the process of primary education: the choice of principles, the structure of the content, form, means and methods of their training.

**The theoretical significance of research** lies in the main components of the didactic system, ensuring the implementation of interdisciplinary integration in the educational process of pupils.

The practical significance of research deals with the study of the fact, that it relies on the results of the development of teaching aids for primary school teachers; in the system of additional education of pupils; training students of pedagogical universities and

colleges; can also be used in continuing education and continuing education courses.

The following provisions apply to protection of dissertation:

1. Introduction of interdisciplinary integration allows us to achieve new pedagogical results, reflecting the completeness and interconnectedness in life, the essence of integration in the pedagogical process.

2. The choice of a system of categorical (broad) knowledge in the context of an integrative approach: - can be designed by creating the prerequisites for the provision of generalized concepts and universality of knowledge that form the language of each subject area.

3. The implementation of interdisciplinary integration in elementary school requires, that pupils take into account age-related features that meet the requirements of the forms of organization of the educational process (developmental games, educational projects, integrated classes and creative workshops).

**Testing and application of research results.** This was implemented during experimental work in secondary school number 2 and 16 named after M.Sh.Vazeh in Ganja. The main results of the study in the materials of international and national scientific conferences with the participation of doctoral students and dissertants held at Ganja State University and other universities of the republic, as well as in the teaching materials of the applicant. On the research topic were published 19 works.

The dissertation consists of an introduction – 1066 characters; chapter I – 90597 characters (1.1. – 31013; 1.2. – 59584), chapter II – 105104 characters (2.1. – 24760; 2.2. – 43455; 2.3. – 36889), conclusion – 8758, total – 205525 characters.

## MAIN CONTENT OF THE WORK

In **introduction** of the dissertation, the relevance of the topic is substantiated, the subject, purpose and objectives of the study, hypotheses, the methodological base, scientific novelty, practical and theoretical foundations are clarified, and the provisions to be protected are determined.



The first chapter of dissertation, entitled **“Theoretical foundations of the use of interdisciplinary integration in elementary school”**, consists of 2 paragraphs. The first paragraph of chapter, entitled **“The concept of interdisciplinary integration and its features in the education of primary schoolchildren”**, explains the nature of interdisciplinary integration and is rethought with reference to various sources. It is shown that in the pedagogical literature there are more than thirty definitions or explanations of the concept of “interdisciplinary communication”. In these definitions and explanations, the concept of interdisciplinary communication is considered from different points of view. Thus, devoted their research to the polytechnical aspects of this problem S.Yu. Batishev, A.P. Belyaev, N.I. Dumchenk, M.I. Makhmutov, P.N. Nikova et al., interdisciplinary communication as a means of improving learning and raising the scientific and theoretical level of education have been studied by such scientists as M.M. Mehdizadeh, Z.I. Garalov, I.I. Aliyev, L.N. Gasimova, N.A. Loshkareva, V.N. Fedorova, D.M. Koryushkina et al., educational aspects were investigated by P.B. Aliyev, Sh.T. Tagiyev, G.I. Belinkova, V.M. Korotov and others. V.N. Maksimova notes that "Interdisciplinary communication increases the intellectual activity of students." According to researchers involved in the mental development of students, interdisciplinary communication is not only a flexible and effective form of a knowledge system, but also a generalization method (Yu.N. Kabanova-Meller).

Idea of interdisciplinary integration arose as a result of studies that contribute to the effective acquisition of environmental knowledge during training. The roots of the integration process originate in classical pedagogy and are associated with the idea of interdisciplinary relations. Y.A. Komensky wrote in his book “Great Didactics”: "Everything that exists in a relationship should be taught in this regard." This hypothesis is reflected in the studies of many scientists: A.G. Hertsen, J. Lock, V.F. Odoevsky, I.G. Pestalotsi, C.D. Ushinsky, U.R. Mammadova et al. J. Lock noted that, one subject should be enriched with elements and facts of other disciplines. I.G. Pestalotsi noted, that the consequences of separating one subject from another may be negative and tried to uncover the

various interdisciplinary connections that exist between the subjects. Interesting approaches to the theory of interdisciplinary relations can be traced in studies in works of N.B. Bunakov, V.Í. Vodovozov, M.A. Danilov, B.P. Yesipov, E.I. Monoszon and etc.

A number of researchers are characterized by the use of teaching methods, cognitive questions and research elements in solving the current problem. These approaches are based on concepts (composition of knowledge) in various disciplines, activities and skills. This allows you to combine educational, educational and developmental tasks with training. In determining the classification model of interdisciplinary relations V.N. Maksimov suggests relying on three main systems: the information structure of the subject, the morphological structure of educational activities, as well as organizational and methodological elements of training. Given that training is a complete process, interdisciplinary interactions operate at three interconnected levels: 1) significant information; 2) practical activities; 3) organizational and methodological. Based on these considerations, interdisciplinary communication can be considered as a system of elements:

1. The content of education is based on interdisciplinary relations due to didactic and methodological methods and means.
2. Visual tools (diagrams, graphs, charts, plans, maps, etc.) reflecting interdisciplinary communication.
3. Forms of interaction teaching individual disciplines.
4. Optimal conditions for the organization of interdisciplinary relations - objective conditions (curricula, textbooks, development of the theoretical foundations of interdisciplinary relations, etc.) and subjective conditions (knowledge of mixed subject programs by teachers, planning of interdisciplinary relations, etc.).
5. Definition of methods of interdisciplinary communication.

The generalization of information in different disciplines leads to the emergence of new knowledge, both theoretical and applied. We are talking about new skills and habits in an interdisciplinary structure. The new structure does not easily translate specific knowledge, concepts and methods of one science into another. The new structure is distinguished by both the quantity and quality of the elements.

A systematic approach to the problem allows us to study the event as a whole with a new integrated quality as a result of interaction.

In the process of interdisciplinary communication, knowledge of one subject is the beginning of the formation of new knowledge in a new structure. The concepts included in this structure, law, category, etc. act as knowledge. The science of knowledge is as scientific as the concept itself.

Interdisciplinary links are different, and interdependence depends on content elements. There are many links that reflect the course as a whole:

- facts and events,
- definitions, categories, laws,
- rules and definitions,
- formula, scheme, etc.

These relationships arise between content elements and the information contained in the subject.

Dissertation also explains the functions of interdisciplinary communication. Analysis and generalization of the study allow us to determine the following functions of interdisciplinary communication: dialectical, logical, psychological and didactic.

*Dialectical function.* The basis of this task is the understanding of the existing objective connection between nature and society, the identification of the basic laws of development of real events and the determination of the relationship between science and them.

*Logical function.* Interdisciplinary communication also includes features of the content of education: the systematization of educational materials, structural features of the subject, as well as the specificity of knowledge, skills. In particular, a logical analysis of the learning process allows you to identify the relationship between specific educational materials. Logic allows you to determine the course, the interaction between the components of knowledge is included.

*Psychological function.* Each educational material has a psychological specificity, which determines the level of interest and independence in learning. The main function of this function is to identify the practical mechanism of psychological processes that flow from the human mind and create connections between different

disciplines. Thus, to reveal the mechanism of interdisciplinary communication, to observe how the analytical and synthetic cognitive actions of students are organized, temporary psychosocial associations (associations) are created, etc. for the assimilation of educational material when teaching various disciplines.

*Didactic function.* Interdisciplinary relations regulated by didactic laws fulfill a number of didactic functions. As a result, some didactic problems are solved. We can identify some tasks that need to be addressed in the learning process: increasing the criteria of knowledge, increasing the effectiveness of training, expanding the range of practical knowledge, skills and abilities.

The current level of development of pedagogical thinking and the results of our research allow us to conclude that a new stage begins in the implementation of interdisciplinary relations - independent, parallel existence, integration of events and integration of events in various disciplines.

Nowadays, integration in schools can be organized in different directions and at different levels. In this case, both interdisciplinary and interdisciplinary types of integration are used. In this case, the concept of “integration” in relation to primary education is adopted in several ways:

- give to the pupils an idea of the full picture of the world (in this case, integration is taken from the goal of training).

- find a platform for the integration of subject knowledge (in this case, this is the position of an integrated learning tool). As a result of the interaction, students gain new knowledge about environmental events, systematically expand their knowledge (spiral cognitive activity);

- development of pupils. Integration in learning characterizes the dialectical features of thinking in modern science. The object to be watched by the student cannot be considered an isolated element. Pupil can master the multifaceted aspects of the subject, making comparisons, abstractions, generalizations.

Study also revealed a feature that characterizes the content of integrated learning: the integration of traditional, classical material and the integration of new learning into the content of school

education. The results that can be obtained from the intersection of these approaches may also differ:

- the creation of completely new courses (subjects);
- creating a new phase of the lesson. This is due to the combination of the material of one or more independent objects.
- organization of one-time comprehensive courses (lessons) of different levels and of different nature.

All this proves that interdisciplinary communication is one of the most promising areas in the development of didactics.

The second chapter, entitled **“Psychophysiological Features of the Education of Primary Schoolchildren”** is devoted to the determination of the psychophysiological features of interdisciplinary communication in elementary school.

Primary school age is a time of great attention in recent years and a special role in the life of a child. The psychological characteristics of primary schoolchildren cannot be fully understood and unchanged, but only the most characteristic features of this age can be discussed. Children of this age are motivated by a desire for assimilation, their enthusiasm and their sensitivity to the environment. 8-9-year-olds try to react with all creativity to the ideas of the teacher and very quickly respond to any new items, jokes or life example. Pupils respond more quickly to the impressions they receive, especially through the senses. The visual aids used in the classroom are always of great interest to them. For 8-9 year olds, it is very characteristic not only to respond directly to their impressions, but also to respond to their impressions. During this period, the ability to perceive, repeat, adapt to adaptation, adaptation to learning, the necessary conditions for verbal expression, the direction of mental activity, enrichment and development of the children's psyche are favorable. The constant contact of children of 8-9 years old with various concepts of the adult world and their attempt to understand them psychologically, to create a sense of perception forms the simplicity and playfulness of this age concept. For children of this age, it is not uncommon to think of any difficulties and confusion. They cling to the areas of their thinking, knowledge and are very

easy to relate to things that are not directly related to them. When they enter this field of knowledge, they continue to play.

The personality direction of a young schoolboy is expressed by his needs and motivations. There are also a number of needs of a young schoolgirl, characteristic of preschool children. He still has a high *demand for games*, but the content of the game is changing. The high school continues to play the games that the teacher created. But now playing, he writes for hours, solves work, reads, draws, reads and so on. This is important to consider when organizing a training event, which can sometimes be turned into an interesting gameplay due to its content.

A young schoolboy is in great need of *physical activity*. He cannot sit still for a long time. This need arises with short breathing. That is why it is necessary to give children more physical activity.

The need for *external impressions* is quite common for junior pupils. Later it becomes a learning curve. First graders are primarily attracted by the appearance of things, events, and events.

Based on the results of our research, we conclude, that the child's collaboration with peers and the coordination of his / her own thoughts are the basis of his structure of intellectual development. The basis for the identification and assimilation of the content of the intellectual structure is the redistribution of activities. In this case, the child refers to the form of organization of joint activities, revealing the altered general meaning of the educational activity for the case participants.

As a result of research conducted by psychologists, two methods of mental activity were identified: analytical and synthetic. In the first case, the human mind as a whole moves to the concrete, and in the second to the general. The study showed that in the primary grades, the second case was much larger than in the first, and in the first case, the children were able to successfully master the educational material without any difficulties in writing and verbal calculations. But the "Synthetics" have a hard time mastering the course.

One of the important requirements of educational activities is that, children should be able to fully substantiate their own judgments and actions. Teacher demonstrates many of the prerequisites for justification in the process of teaching and learning.

The need to separate the judicial system from each other and independent efforts to establish these judgments lead to the formation of the ability of younger students to review and evaluate their judgments and actions. This skill is an important quality based on a reflex that allows children to analyze their judgments and actions meaningfully and objectively.

Independence, internal action plans and reflection are key innovations identified in primary school students. With their help, the psychology of the youngest student reaches the level of development necessary for future school education.

The learning process should be structured so that motivation is not related to the activities that the child attends at school, but to the content and content of the subject itself. When the motivation and content of educational activities do not coincide, motivation gradually begins to lose its strength, and sometimes motivation does not work at the beginning of the second grade. Therefore, a motivation for learning should be created in the school. Learning motivation is a psychological characteristic of a student's interest in acquiring knowledge, acquiring certain skills and skills for their development.

One of the most important conditions for learning motivation is that the student has the motivation for self-improvement, which is impossible without the necessary skills.

The second chapter of the dissertation, entitled **“Interdisciplinary integration as a pedagogical technology in primary education”**, consists of three paragraphs. The first paragraph, entitled **“An integrated approach to the development of primary education”**, is characterized by a new era in the development of mankind - “integrated society”. In our opinion, the main goal of our study is to create an environment that allows us to personalize the growing information abundance in the integrated community and the ability to use new technologies for access, processing and dissemination of information.

One of the key components of a new approach to teaching children in dissertation is the use of interdisciplinary integration, which combines content and teaching methods to ensure universal education. The main theoretical ideas of the new approach are:

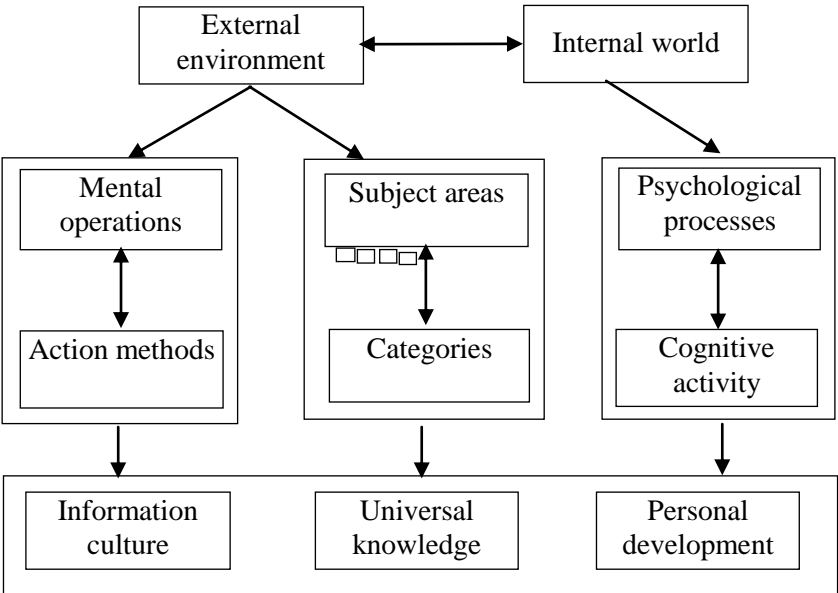
1. Universal content of education can be ensured by creating a system covering all areas of education. Each of these areas should have a certain category of language that reflects the world and language (general concepts that can be formed as the “language” of the learning environment, which will describe the processes, objects and events of the environment).

2. In addition to the formation of a system of categories in education, teaching methods should be organized. This includes a combination of both universal and special disciplines, which form the basis of information culture.

3. The universality of education should provide conditions for life, interests and abilities of each person. These theoretical and conceptual ideas can lay the foundation for building integrated educational technologies.

The structure and principles of integrated educational technology. The main components of educational technologies based on the information-categorical approach (ICY) are: perception of the world (external environment) and self-awareness (internal world). Each of these processes goes through several stages. (scheme 2.1.)

**Scheme 2.1.**





The process of understanding the world begins with the expression of its objects and events in the definitions of certain disciplines. This time, analysis, generalization, their unity, comparisons, abstractions, etc. such as mental operations. The next step is the categorization of categories and a hierarchy of concepts. Here the hierarchy is intended as the basis of universal knowledge (interdependence and dependence of concepts).

The choice of categories for inclusion in the content of integrated disciplines should also take into account:

1. Each category should consist of fundamental concepts, both as a "language" and used in determining the subject area.
2. The category should be adapted to the current stage of training.
3. A category related to one subject area can be integrated with other disciplines.

Each category has definitions, operations, functions and models in the information space.

Unlike traditional traditional teaching systems, we now have some elements of such subjects as history and economics in the primary education system: let a modern person teach economic theory and practice (such as mathematics, physics, chemistry, biology, and other "school" sciences) life experience information is also very important. The sooner a student becomes familiar with economic concepts and terms, the easier it will be for him to build his future life.

According to the spirit of the thesis, the goal of economic education of young schoolchildren is to provide them with the basic foundation of economic thinking, knowledge of economic activity, understanding of their place in the economic life of society and the development of economic activity skills. get acquainted with economic concepts, give them basic economic knowledge. In the field of motivation - to generate interest in the field of economics, economic knowledge.

Principles of economic education are also defined in the process of integrated learning: relevance: - the transition from knowledge about known types of economic activity to their nature, from simple practical experience to complex, from various concepts to elements of

economic theory; integration: synthesis of other disciplines with elements of economic knowledge (mathematics, life sciences, etc.); Continuity: coverage of all levels of education, starting with preschool institutions, the system of economic education.

This semichapter describes a separate table, for example, the basic concepts of mathematics that are included in the curriculum of elementary school. Each category indicated in the table consists of definitions that form the content of a particular section of the mathematical program. Thus, numbers and variables - accounting materials, geometry, shape and area - as well as volumes and models form the basis for studying text accounting problems.

There is a parallel with the formation of knowledge about categories and the acquisition of information culture from pupils. This process can be divided into several stages.

At the first stage, mathematical characteristics reflect the characteristics of events and environmental objects (for example, quantity, length, etc.). The main task of this stage is to teach students to distinguish features and characteristics of things and move from the unknown to the abstract.

The second stage is characterized by the translation of special mathematical concepts into mathematical symbols, that is, the process of encoding information, which in itself goes through several stages: starting with geometric shapes and using ordinary symbols.

The third stage - familiarity with well-known algorithms, the development of the ability to design and use their own algorithms for solving problems. It should be noted that in the course of elementary mathematics there are many questions about algorithms (especially about methods for solving equations, computational a priori, etc.).

The fourth stage is the work or development of mathematical models. In some cases, this step may not even be present. The following types of problems can be the best illustration for this work: ask the equation problem, select the numerical expression corresponding to the given drawing, and so on.

The most distinctive feature of this course is that mathematics as an object not only forms knowledge, skills and habits, but also

plays a role in understanding and reflecting the world around us. This is primarily reflected in the content of the training.

Integration of the existing mathematical course with elements of computer science, both in terms of content and teaching technology (coding, algorithmization and modeling) also helps students develop mathematical skills.

The second chapter, entitled **“Forms of educational and methodological processes that implement interdisciplinary integration”**, is devoted to the features of formally integrated lessons that develop skills based on games and creative workshops. It was shown, that interdisciplinary relations in the elementary grades serve for the systematic development of children, and not for the totality of knowledge. Pupils' understanding of simple relationships helps build relationships between the parts of the material to be mastered and its logic. School children will learn about the three states of matter and their relationships, the practical application of the phenomena studied, the harmony of the laws of animate and inanimate nature and the objectivity of the environment. The main task of the teacher should be to create a psychological environment in which students actively learn to interact with various subjects.

By the time interdisciplinary relations are established, classes can be classified as follows: 1. *Lessons on the mechanical relationships between disciplines*. At the same time, other disciplines are used sporadically for the full and comprehensive assimilation of knowledge; 2. *Interdisciplinary lessons*. The position and level of participation of various academic subjects is revealed in the essence and method of perception of the subject, and the mastery of the teacher lies in the fact that he or she implements an interdisciplinary approach; 3. *Integrated lessons*. The content of various academic disciplines is combined at the same time and presented in one lesson. At the same time, there is a parallel “existence” of materials in two or more subjects; 4. *Mini-lessons (Sh.A. Amonashvili)*. The essence of the mini-lesson is that in one lesson two or three subject materials alternate (each minus interval varies from 10 to 20 minutes). There will also be dynamic physical intervals (minus intervals) as a kind of relaxation among minors.

In this part of semichapter, the experimental classes provide examples of joint classes in the Azerbaijani language, life sciences, and music. As a result, basic courses based on the informational-categorical approach (providing additional information along with the concept) led to the creation of new forms of training materials. We have prepared an educational project for this form. This project is a set of interdisciplinary training tasks that are united by a common line. In the course of educational assignments, pupils are developing a process of understanding and understanding of concepts, which is a very important step in the process of coding, algorithmization and modeling. Since the educational project covers several areas of knowledge, it serves as an interdisciplinary course. Work on the educational project ends when the pupil has already completed several topics in various disciplines, and in the meantime a general lesson is organized.

In paragraph, titled “**Educational games**” it is determined, that the direction of the modern school is humanized by the educational process and the comprehensive development of the child’s personality, especially by the creative activity of personal learning, which forms the basic knowledge, skills and abilities, develops students' individual abilities, their ability to act independently, ability and so on. It makes up. The most important task of the teaching staff is to actively participate in the traditional educational process and develop educational activities aimed at developing a child’s individual motivation and analytical-synthetic worldview, memory, attention, imagination and a number of important psychological functions. It was found, that the educational activity, which is traditionally mastered by students of the main school curriculum, is not properly associated with creative activity, which can impede the intellectual development of the child. Accompanying standard tasks, which are considered the only solution in traditional learning, consists mainly in strengthening habits, as a rule, based on some algorithms that allow children to effectively use and develop their intellectual potential they do not possess. On the other hand, solving the same problem only undermines the student’s personality, because the teacher’s appreciation of the student and his or her skills depends

only on his or her efforts and efforts. independent creative skills are not taken into account.

Dissertation is based on the fact that one of the main tasks of using developmental activities is to increase the child's creative activity that does not correspond to the student's age or does not exceed him (as a result, the scope of the standard program is limited). In this case, special corrective work is required. The failure or delay in the development of the student is often due to insufficient consideration of the basic psychological functions in the pedagogical process.

In the paragraph, titled "**Creative skills**" it is shown, that the main goal of mastery technology is the transfer of working knowledge, and not specific knowledge. That is, not in order to transmit and absorb any information, but to explain how and where to get it. The main goal of a creative skill is to acquire psychological tools that allow students to self-educate, to understand themselves and their place in life, in order to allow other people to understand the perspectives and legitimacy of the environment in which they live. to overcome the passage.

The section also lists and substantiates conceptual ideas that reflect the core of educational technology.

It is shown that as a leading master, the teacher plays the role of an adviser, which facilitates the organization of teaching work, controls the development of action methods and helps to understand the nature of work in a timely manner. He must be able to discover human abilities, recognize what is happening inside and outside the human body, and eliminate the reasons that impede the realization of natural creative potential.

All actions and tasks of the teacher should be directed in such a way as to stimulate the child's imagination and create an environment in which he or she can be creative.

Ability as a psychological preparation helps to penetrate into the mysterious world of a person and reveal what he wants, which is a subtle aspect of the master's work.

The results of the study and the effectiveness of the pedagogical system developed in the last third chapter under the name

**“Pedagogical Experiment”** were tested during a pedagogical experiment conducted in secondary schools in Ganja city (secondary schools No. 2, 5 and 16), in schools in Dashkesan and Goygol district.

As experimental classes have been determined 1<sup>8(f)</sup> and IV<sup>3(c)</sup> in school number 16 in Ganja city; also 1<sup>3(c)</sup> and IV<sup>3(c)</sup> classes of school number 2; as control classes 1<sup>9(g)</sup> and IV<sup>4(d)</sup> in school number 16; 1<sup>1(a)</sup> and IV<sup>2(b)</sup> classes of school number 2.

The experimental verification was carried out in two directions:

- the level of development of thinking of children before and after training based on the proposed methodology;
- Development of the Azerbaijani language, natural sciences and mathematics to determine trends and level of development.

In the experimental and control classes, standardized psychological tests were used to assess the level of development of thinking and mastery of students, determine the level of development of visual, practical, figurative and verbal-logical thinking.

It is known, that definitions of concepts, identification of similar and distinctive features in objects, explanation of reasons (Test 1) is a cognitive operation that allows a child to assess the level of development of intellectual processes. During the experiment, these real thinking features were identified based on the correct answer of children to 20 questions.

*Analysis of the results.* The child receives 0.5 points for the correct answer to each question, so the maximum score that he can get is 10 points.

Before assessing the correctness of a particular answer, it is important to make sure that the child’s question is fully understood. Although this method was used in many experimental studies during the psychoanalysis of the oral logical thinking of children entering school, this approach also makes it possible to assess the abilities of primary school children, draw rational conclusions and create the basic thinking that we mentioned in the previous chapters.

Evaluation of the results of the pedagogical diagnostic test associated with the formation of concepts (Test 2) is as follows. Pupil’s answers are divided into levels depending on their quality and

are evaluated on a 10-point scale. Two-year test results are shown in the following diagram.

At the end of the third grade, students in the control and experimental classes are tested to determine the level of their mathematical and cognitive tasks.

Average criteria are used to evaluate the results of tasks in written works and tasks in natural science.

Each task is rated at two points. So the maximum score is 16.

Experimental data:  $p_1$  - volume of the first choice;  $p_2$  - the volume of the second option.  $p_1 = 23$  (Number of pupils in 3 "a" class) and  $p_2 = 25$  (Number of pupils in grade 3 "b" class).

As a hypothesis with a zero sum ( $H_0$ ) we accept the following rule: "The basic level of mathematical training in each class is the same." As an alternative hypothesis ( $H_1$ ), another judgment is adopted: "The level of logical thinking is different in both variants."

A score sheet (Table 2.3.1. in dissertation) is compiled to determine the median criterion. The table shows that  $m = 9$  ( $m$  is the middle of the number).

Let's compile table 10 to calculate (T) statistical criteria.

**Table 2.3.1.**

**Calculation table of (T) statistical criterion**

The amount of points	Absolute frequency in the first option	Absolute frequency in the second option		In the options total of frequencies	Total sum of accumulated frequencies $\varepsilon$
	$\gamma_1$	$\gamma_2$		$\gamma_1 + \gamma_2 = \gamma$	
16	1	-		1	18
15	2	-		2	47
14	1	1	1	2	45
13	2	1	1	3	43
12	3	2	2	5	40
11	1	2	2	3	35
10	3	2	2	5	32
9	4	5	5	9	27
8	2	2	2	4	18
7	1	2	2	3	14
6	1	3	3	4	11
5	1	2	2	3	7
4	1	2	2	3	4
3	-	1	1	1	1
2	-	-	-	-	-
1	-	-	-	-	-
0	-	-	-	-	-
> 9	13	a	b	8	
< 9	10	c	d	17	
	23			25	

Calculate T using the following formula:

$$T = \frac{N \cdot \left( (a \cdot d - c \cdot b) - \frac{N}{2} \right)^2}{(a + b)(c + d)(a + c)(b + d)}$$



We get, that  $T = 2,02$ . Thus,  $T_{\text{critical}} > T_{\text{observation}}$  ( $T_{\text{critical}} = 3,841$ ). In accordance with the decision-making procedure, we exclude  $H_0$  hypothesis by adopting the  $H_1$  hypothesis: the basic level of preparation for the development of thinking varies.

According to the results of studies and analyzes, it can be noted that student performance in the experimental classes is higher than in the rest.

According to the research, the following **general conclusions** can be drawn:

1. Since the main paradigm of research is developmental learning, the development of intellectual abilities and curiosity of a young pupil are its most important component. Therefore, the solution of problems associated with the teaching of the Azerbaijani language, mathematics, life sciences and other disciplines in the initial educational process is possible using a specially developed interdisciplinary method.

2. Based on a literature review summarizing the results of research by local and foreign scholars on the problem of interdisciplinary integration, importance of a new educational paradigm was emphasized and the main trends in the development of the existing problem with psychological, pedagogical and methodological prisms were considered. This allowed us to formulate conceptual approaches to building interdisciplinary relations in elementary school.

3. To implement interdisciplinary integration in the elementary school, a didactic training system was developed, which covers the content of training, methods of its assimilation and forms of organization of the educational process.

4. The methodology developed in the developmental learning environment complies with the principles of personality-oriented learning and is consistent with the concept of the information approach, the key component of which is knowledge and information culture. Their combination will create conditions for achieving the universality of education.

5. The main provisions of the theory of educational activity, which contribute to the developing function of learning, allow

significant changes in the structure of the educational process. Learning effectiveness is usually measured by the quantity and quality of knowledge gained, and development effectiveness is measured by the level of pupils' competence. As the basic forms of mental activity of pupils develop, pupil will be able to determine the direction and future activities of the environment as quickly as possible.

6. Motivation of interest is closely related to the content and teaching methods. One of the first conditions for transforming activities into educational activities is a change in motivation.

7. When evaluating the effectiveness of the proposed pedagogical method, the results of expert-psychological experience confirm the hypothesis and show its significance for discovering the personal qualities of the child in this process.

**The main provisions, main ideas put forward in the study, basic results obtained of dissertation are reflected in the following publications of the author:**

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2. Fənlərin inteqrasiyasına dair yeni mülahizə. // Bakı Slavyan Universiteti, Humanitar elmlərin öyrənilməsinin aktual problemləri, 2015, №4, s. 301-304.

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5. İbtidai siniflərdə fənlərarası inteqrasiyanın reallaşdırılması. // Təhsil Nazirliyi Gənc Tədqiqatçıların XX Respublika Elmi Konfransının materialları. Bakı, 2016, 2 cild. s. 394-397.

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8. Təhsil kurikulumlarında fənlərin inteqrasiyası probleminin qoyuluşu haqqında // “Təhsil kurikulumları: praktik tətbiqlər” mövzusunda keçirilmiş respublika konfransının materialları. Naxçıvan Müəllimlər İnstitutu, aprel, 2017, s. 80-84.

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The defense will be held on 13 may 2022 at 11<sup>00</sup> at the meeting of the Dissertation council FD 2.40 of Supreme Attestation Commission under the President of the Republic of Azerbaijan operating at Nakhchivan Teachers Institute.

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Dissertation is accessible at the Nakhchivan Teachers Institute Library.

Electronic versions of dissertation and its abstract are available on the official website of the Nakhchivan Teachers Institute ([www.nmi.edu.az](http://www.nmi.edu.az)).

Abstract was sent to the required addresses on 11 april 2022.

Signed for print: 09.04.2022

Paper format: 60x84 1/16

Volume: 39 722 characters

Number of hard copies: 20