

INTERDISCIPLINARY CONNECTIONS IN EDUCATION AS A PEDAGOGICAL PROBLEM

CONEXÕES INTERDISCIPLINARES NA EDUCAÇÃO COMO UM PROBLEMA PEDAGÓGICO

LAS CONEXIONES INTERDISCIPLINARIAS EN LA EDUCACIÓN COMO PROBLEMA PEDAGÓGICO

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ABSTRACT: The topic of interdisciplinary connections has recently become the subject of wide discussions in journals, monographs, educational websites, and program documents of government publications. Along with this topic, this article examines the role of interdisciplinary connections in the process of improving the quality of education. It was determined that the main task of modern pedagogy is to improve the quality of education and ensure the comprehensive development of the younger generation. These qualities were determined not only because students learned facts, but also because they needed to be able to acquire and select the necessary knowledge, synthesize, generalize and unite them around scientific ideas, objects, and processes taking place in real life. The analysis showed that over the centuries, researchers have been looking for more efficient and rational solutions to the problems of ensuring the synthesis, integration, and merging of parts. One of them is solving the problem of knowledge synthesis through interdisciplinary communication. Interdisciplinary communication is a multifaceted problem.

KEYWORDS: Schooling. Interdisciplinary communications. Theory and history of the study of interdisciplinary communications.

RESUMO: *O tópico das conexões interdisciplinares tornou-se recentemente o assunto de amplas discussões em periódicos, monografias, sites educacionais e documentos de programas de publicações governamentais. Junto com este tópico, este artigo examina o papel das conexões interdisciplinares no processo de melhoria da qualidade da educação. Determinou-se que a principal tarefa da pedagogia moderna é melhorar a qualidade da educação e garantir o desenvolvimento integral da geração mais jovem. Essas qualidades foram determinadas não apenas porque os alunos aprenderam fatos, mas também porque precisavam ser capazes de adquirir e selecionar o conhecimento necessário, sintetizá-lo, generalizá-lo e uni-lo em torno de ideias, objetos e processos científicos que ocorrem na vida real. A análise mostrou que, ao longo dos séculos, os pesquisadores têm buscado soluções mais eficientes e racionais para os problemas de síntese, integração e fusão das partes. Uma delas é resolver o problema da síntese do conhecimento por meio da comunicação interdisciplinar. A comunicação interdisciplinar é um problema multifacetado.*

PALAVRAS-CHAVE: *Escolaridade. Comunicação interdisciplinar. Teoria e história do estudo das comunicações interdisciplinares.*

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RESUMEN: *El tema de las conexiones interdisciplinarias se ha convertido recientemente en tema de amplias discusiones en revistas, monografías, sitios web educativos y documentos de programas de publicaciones gubernamentales. Junto con este tema, este artículo examina el papel de las conexiones interdisciplinarias en el proceso de mejora de la calidad de la educación. Se determinó que la principal tarea de la pedagogía moderna es mejorar la calidad de la educación y asegurar el desarrollo integral de la generación más joven. Estas cualidades se determinaron no solo porque los estudiantes aprendieron hechos, sino también porque necesitaban poder adquirir y seleccionar los conocimientos necesarios, sintetizarlos, generalizarlos y unirlos en torno a ideas, objetos y procesos científicos que tienen lugar en la vida real. El análisis mostró que a lo largo de los siglos, los investigadores han estado buscando soluciones más eficientes y racionales a los problemas de asegurar la síntesis, integración y fusión de partes. Uno de ellos es resolver el problema de la síntesis de conocimientos a través de la comunicación interdisciplinar. La comunicación interdisciplinaria es un problema multifacético.*

PALABRAS CLAVE: *Escolaridad. Comunicaciones interdisciplinarias. Teoría e historia del estudio de las comunicaciones interdisciplinarias.*

Introduction

In the scientific literature, the concept of interdisciplinarity develops mainly in two directions: within the Anglo-Saxon and American schools (functional, pragmatic and utilitarian approaches with an emphasis on pedagogical methods and the real life), as well as within the framework of the French and European schools (in this case more attention is devoted to the issues of epistemology, theoretical issues of analysis of the nature and essence of interdisciplinary connections between subjects of study) (YVES, 2015).

Attention is drawn to the abundance of methods in the analysis of interdisciplinary approaches and the need for their systematization (BRUCE, 2004). In general, available literature on the problem is thematically subdivided into consideration of the concepts of disciplinarity, interdisciplinarity, the practice of applying interdisciplinarity, including the one in teaching, as well as the reflection of this problem in the education system (BREWER, 1995; KLEIN, 1990). There is a specialization in the consideration of interdisciplinary relationships in subjects and branches of science, where standards are successfully determined to strengthen these ties and their rational use (GEBBIE, 2008; FRANK, 1988)

Considering the real return in teaching an interdisciplinary approach, the authors of the studies separately highlight the problems within the framework of scientific and theoretical knowledge, and the applied aspects of the problem (institutional structures, curricula, teaching methods, and teacher training programs) (CHUBIN, 1986). The need to integrate efforts in

using the advantages of the interdisciplinary education system is emphasized (KLEIN, 1990; MADSEN, 2018).

Almost all researchers of this problem take an active position, since it is believed that there is a basis for creativity. Many intellectual, social and practical problems require interdisciplinary approach. In general, the world is one and there is one knowledge about it, which is manifested in the presence of many borderline phenomena that require considering the cross-border links (MARIAN; GILLIAN, 1999; MOTI, 1997). The pedagogy of interdisciplinary communication is successfully developing, with a focus on applied activities aimed at developing critical thinking, creativity, cooperation, and communication in order to prepare students for solving the problems of the 21st century (Styron R.A.).

In addition, there is a rich practice of developing models for the application of interdisciplinary relationships, for example, in law schools (Weinberg A.)

Methods

In the context of the earlier specialization of education, it is necessary to have such programs and textbooks in mathematics that could effectively differentiate the complete and deep assimilation of the material by students. This is possible due to the implementation of different stages of ensuring interdisciplinary connections in training courses. Strengthening interdisciplinary ties should be considered as one of the most important areas of didactic improvement of the school curriculum in mathematics. Based on the analysis of the history and theory of the issue of interdisciplinary connections in pedagogy, we will try to determine their significance for the study of school mathematics.

Results

The role of interdisciplinary communication in the teaching process is very big. It directly influences the achievement of the goals of teaching, such as sharing the knowledge, development, and upbringing. At the same time, interdisciplinary relationships shape students' scientific worldviews, help them see the world in action and development, enable logical connections between subject concepts and thus develop students' logical thinking, act as methods to eliminate formalism in their knowledge. It also allows to reduce the teaching time and to form a dynamic, qualitatively changeable system of knowledge, which allows to avoid overloading. The task of the teacher is to equip students with the cognitive apparatus through

the activity of mastering these connections. This, in turn, requires the formation of a certain system of skills and habits. All skills and habits can be divided into two groups: special groups formed on the basis of one subject and general groups formed on the basis of a system of many subjects.

Observations show that the main feature of these relations is their great role in mastering the generalized nature of students' cognitive activity, improving the scientific-theoretical and practical training of the younger generation. These skills allow high school graduates to use their knowledge and skills in specific situations in their future research, work, and social life when discussing specific issues in teaching and extracurricular activities.

A well-known Russian teacher, K. D. Ushinsky (1948, p. 178) wrote: "It is not the scholastic sciences that should be placed at the forefront of teaching, but the knowledge and ideas of any science, which organically builds a broad and enlightened point of view in life and the world".

The study of school practice, as well as observations show that the study of teaching materials on the basis of interdisciplinary relationships creates favorable conditions for the development of general methods of mental activity.

Interdisciplinary relations allow for the scientific construction of cognitive activity, which is important for the development of individual creative potential of students due to the content of factual material and the nature of intellectual labor, broad and deep "vision" of the main problems of reality, which in turn is constantly changing and helps to train specialists who are able to solve complex problems (FEDORETS, 1983, p. 4).

Thus, with the help of comprehensive interdisciplinary relations, students acquire the leading ideas of school subjects, simultaneously having a whole scientific system of knowledge created and forming the worldview as a higher synthesis of the basis of science, art, and thinking.

Let us take a look at the development of ideas on interdisciplinary relations in the history of pedagogy. In this regard, it should be noted that philosophical views on the socio-political life of society, the processes of differentiation and integration of scientific knowledge were reflected in the issues of connection and separation of the content of educational material.

Even in the Renaissance, the process of differentiation involved integration, and many educators of the time saw the harmfulness of teaching separate subjects, which led to the narrowing of formal-scholastic concepts, the interrelationships, and interactions of interdependent subjects, natural, cognitive, and social phenomena and processes.

The idea of combining knowledge in the works of J. A. Comenius and John Locke is primarily related to their struggle against scholasticism, which stifles the educational process. Comenius states that "only those things are taken together that are connected with each other always and everywhere" (COMENIUS, 1982, p. 378). According to John Locke, "the method of filling the content of one subject with the elements and facts of another helps not only to master the basics of science, but also to form the child's actions, skills, and habits, comprehensive knowledge of different areas of life" (LOCKE, 1939, p. 240-241). These ideas of Comenius and John Locke are developed by I. Herbert, A. Disterverg and K. D. Ushinsky. Thus, I. Herbert tried to psychologically justify the need for interdisciplinary relations (HERBERT, 1913, p. 57), the German pedagogue A. Disterverg (1956, p. 178-179) strongly emphasizes the need for interdisciplinary relations in the systematic, thorough study of all subjects taught at school. K. D. Ushinsky (1948, p. 346-365) justifies the need for interdisciplinary relations from a psychological point of view. Unlike other authors, K.D. Ushinsky not only substantiated the idea of interdisciplinary relations, but also practiced at the Smolny Institute. The idea of interdisciplinary relations continues in the works of K. D. Ushinsky, A. Disterverg, V. F. Odoevsky, V. O. Belinsky, A. I. Gertsen, N. G. Dobrolyubov. The above-mentioned authors, especially V. G. Belinsky (1948, p. 126), saw the harmfulness of teaching subjects in isolation and advocated for the "whole education". According to N. G. Chernyshevsky (1982, p. 261), "the fundamental achievements of one science did not stay ineffective for other sciences". As can be seen from the above, the idea of interdisciplinary relations is determined in each of them by philosophical and social views.

In the commentary of John Locke and I. Herbert, the idea of interdisciplinary relations finds its continuation in the works of G. Kerschensteiner (1915), V. Lay (1920), J. Duine. G. Kerschensteiner (1915), a supporter of the dual system of education, does not refer his idea to real schools and gymnasiums, but offers an integrative basis for the integration of knowledge in labour schools for the children "in school, garden, workshop".

For gymnasiums and real schools, he recommends a subject system of education, but, unfortunately, does not address the problem of interdisciplinary relations, as opposed to primary schools. Apparently, this is not accidental, as the establishment of interdisciplinary relations in schools prepared by future officials and industrialists led to the formation of elements of the scientific worldview of the rising generation. In the works of V. Lay (1920, p. 5), there are interdisciplinary relations, especially in relation to dual bioregulated teaching (spectator-material and descriptive-formal), but with purely mechanical principles. This makes it impossible to form a scientific worldview.

The system proposed by J. Duine is not enough to understand the regularities of school sciences as individualized knowledge. This, in turn, sharply weakens the intellectual activity of students and denies the need for deeply systematized knowledge (LAY, 1920, p. 5).

From the works of European educators such as G. Kerschensteiner, V. Lay and J. Dewey, it is clear that they sharply simplify the ideas of knowledge synthesis and interdisciplinary relations, as they increase the ability of students to generalize and thus lead to the development of scientific outlook.

Many modern educators and scholars (G. Frasinger, E. Hoffman, P. Moncer) also go away from the subject-based teaching and turn certain classroom lessons into a complex of research on the "project method". G. F. Fedorets writes: "In this case, the unifying factor is the activity of students in any experiment, in which students themselves understand what they need to know" (FEDORETS, 1983, p.15). This, as we know, violates the logic of the construction of subjects, the history of knowledge, sharply reduces the level of theoretical training of students, as the synthesis of knowledge revolves around that experience.

One of the most interesting forms of communication between different systematic knowledge is a complex form of teaching, in which a teacher uses "integrated days" and "reunion days" and teaches all subjects in primary and sometimes middle grades (SHOGNER, 1959, p. 36). As an interesting form of teaching, the "complex" form can be justified by the principle of a teacher only when the teacher carries out interdisciplinary approach. In the former European socialist countries (Czechoslovakia, Germany, Hungary) the problem of interdisciplinary relations is not only the coordination of subjects, but also the introduction to integrative generalized courses.

In the former Soviet school, the issue of interdisciplinary relations was raised as a problem of a comprehensive study of teaching materials and reality in the early years of Soviet rule. N. K. Krupskaya, P. P. Blonsky, E. I. Rudnev, K. I. Baturina, N. I. Fedorak and others studied and applied the problem of interdisciplinary relations in secondary schools. For example, N. K. Krupskaya proposed to study the phenomena of nature and society, which have a place in reality, interaction and unity. Therefore, in the first years of Soviet rule, the trend in the field of education was confirmed: labor and country studies, and it was intended to generalize and combine different school subjects knowledge around those two factors. During these years, the idea of a comprehensive approach to improving curricula and programs emerged. Curricula and programs developed over the years underestimated the importance of theoretical knowledge, the child's experience was fetishized, idealized, and program developers simplified the popular position of dialectics in terms of relation and development of all events.

Researcher and pedagogue E. I. Rudneva writes: "At that time, Krupskaya firmly and repeatedly affirmed that the essence of labor programs is not the concentration of all teaching material around a complex topic, but a labor activity" (RUDNEVA, 1968, p. 173).

This proves that the complex approach to the study of teaching materials in the 1920s was misinterpreted from a theoretical and practical point of view, and the combination of teaching materials around the "stem" leads to a violation of the elementary need for systematic and consistent study of the scientific basis for fragmentary, superficial knowledge. As it can be seen, the concept of interdisciplinary relations loses its essence in complex teaching. However, according to the scientist-pedagogue G. I. Baturina, "if the teaching complex is considered as a whole, it represents an interdisciplinary system that combines knowledge of this or that object of reality, consisting of different scientific bases" (BATURINA, 1974, p. 44).

N.K. Krupskaya's ideas about the connection of a comprehensive study of educational material with life events are still relevant today. However, these ideas did not find their real expression in the 30s, 40s, and early 50s. The reason for this was the spread of pedagogical stencils, which prevented the direct participation of the pedagogical community in the development and research of the educational process.

Discussions

Interest to the problem of interdisciplinary connections has been growing since the 1950s for the following reasons: a) The scientific and technological revolution of the 1950s placed new demands on all aspects of human activity, including public education and pedagogical sciences; b) there is an intensive, growing mutual influence of science, technology, and production; c) a comprehensive approach to solving industrial, scientific, and sociological problems is applied; c) new discoveries are often made from the collision of several sciences; d) the next merger and mutual enrichment of the social and natural sciences takes place; e) the process of differentiation and integration of scientific knowledge deepens (FEDORETS, 1983, p. 19). In modern Russian pedagogical literature (R. N. Novikov and E. E. Minchenkov) there are 3 approaches to the content of teaching on the basis of interdisciplinary relations:

1) Interdisciplinary relations are the basis for studying the sequence of teaching material and determining its content; 2) the content of the subject arises from interdisciplinary relations; 3) Interdisciplinary relations.

According to G. F. Fedorets, it is necessary to agree with the opinion of E. E. Minchenkov and P. N. Novikov that "the first and second approaches violate the logic of the

subject and the content system of the school curriculum, fetishize the idea of interdisciplinary relations. G. F. Fedorets writes:

The third approach is the most perspective one. At the same time, the vast majority of authors do not solve the problem of comprehensive study of teaching material with the help of objectively necessary leading ideas from the subject of interdisciplinary relations, they limit themselves not only to goals but also to volume and interdisciplinary relations. The approach to solving interdisciplinary problems both theoretically and practically allows to determine the objective scientific criteria in the events that create and plan interdisciplinary relations, to clarify the main purpose of interdisciplinary relations, and to address complex issues facing modern education. (FEDORETS, 1983, p. 22).

The analysis of psycho-pedagogical literature on the problem of interdisciplinary relations shows that this process goes in the following directions: general pedagogical, individual, psycho-didactic, and didactic-methodological aspects.

After a thorough analysis of the idea of interdisciplinary relations in pedagogy, the famous modern pedagogue in Russia G. F. Fedorets comes to the following conclusions: 1) The development of this idea is the interaction between objects, processes, and events of the real world. It is related to the development of philosophical and scientific views on the problems of differentiation and integration of sciences. 2) The system of combining different knowledge and skills was determined by the development of the level of interdisciplinary relations determined by the integration of methodological, scientific, social, and pedagogical objects in the search for an integrative basis and didactic object that performs the organizational function. Thus, the analysis of the above-mentioned psycho-pedagogical and methodological literature on the problem of interdisciplinary relations allows to solve this problem, first of all, at the level of two "mixed" subjects of the "chain" or several subjects of different "series". Also, in many cases, interdisciplinary relationships are established between subjects and their parts, which for one reason or another are the focus of scholars and educators.

The importance of interdisciplinary relationships stems from the following positions: a) The various relationships in the content of subjects are a reflection of the real relationships that exist between the processes, events and objects of the real world; b) The acquisition of scientific knowledge in school is currently based on the subject structure of the content of each subject, which is then broken down into subjects; c) Each system unit of teaching content has its own fundamental position.

One of the latest research works in our country to explain the essence of interdisciplinary communication is a dissertation written by B. Seyidzadeh in 1995 on "Organization of work on

the teaching of mother tongue in other subjects" in primary school. Let us take a look at page 7 of the dissertation's abstract: "Research shows that there is no consensus on the essence of interdisciplinary communication". The interdisciplinary connection is perceived differently by various scholars. B. P. Shuman considers it to be a means of connection, P. G. Kulagin's – a work system, K. P. Korolyova perceives it as a feature of educational content, N. M. Charkazzadeh - as didactic conditions, N. S. Antonov - as a structure of educational content, N. A. Loshkaryova thinks of it as an independent principle of didactics, I. D. Zveryev thinks it is a principle. M. M. Mehdizadeh includes interdisciplinary communication in the category of didactic principles. In our opinion, the interaction of interdisciplinary communication with other principles of didactics and many pedagogical events should be taken into account and treated as a complex psycho-pedagogical principle. Interdisciplinary communication is able to implement all didactic principles in the learning process by strengthening the interaction. This principle fulfills its constructive function: it influences the structure of curricula, programs and textbooks, the choice of content, method and form of training.

However, we do not see "Interdisciplinary connection" as a principle in the list of principles of didactics proposed by a number of Azerbaijani pedagogues, including professors B. A. Ahmadov and B. P. Bashirov. It can be concluded that interdisciplinary communication is a pedagogical method that enriches the content of training, creates conditions for students to understand the content of training and remember it for a long time. This can be considered as a kind of confirmation of B. P. Schumann's attitude to interdisciplinary communication. On the other hand, given the possibility of using interdisciplinary communication as a tool in all the principles of didactics in general pedagogy, we can say that interdisciplinary communication is an indispensable and very powerful tool, pedagogical and methodological method in the complex teaching and implementation of all didactic principles. This again shows that the nature of interdisciplinary communication is multifaceted, but it would not be correct to call it a principle of didactics. In our opinion, the correct nature of interdisciplinary communication still needs to be clarified as a result of numerous studies.

The connection of science, especially mathematics, with art has been noted by a number of scholars in their works. The great Russian scientist N. E. Zhukovsky compares the beauty of mathematics with fine arts and poetry as follows: "Mathematics has its own beauty, as do painting and poetry" (GONCHAROV, 1978, p. 102).

The great scientist A. Einstein explained the connection of science with art as follows: "Scientific thought always involves a certain element of poetry. Real science and real music require a thought process with the same roots" (EINSTEIN, 1985, p. 132). The famous Russian

pedagogue K. D. Ushinsky (1950, p. 606) wrote: "Every science has an aesthetic element to one degree or another". Since the teacher teaches all subjects in the primary grades, all the subjects he teaches can be taught in an interconnected way. In this sense, if interdisciplinary connection means a connection between two subjects (for example, mathematics-music, mathematics-fine arts, mathematics-mother tongue, mathematics-fiction), interdisciplinary interaction should consider the teaching of subjects other than the elements of mathematics.

Just as there are opportunities to use other subjects in the teaching of mathematics, it is also possible to use mathematical concepts in the teaching of other subjects.

In primary school, we can accept the use of the idea of "interdisciplinary interaction" along with "interdisciplinary communication". Considering that in addition to the subjects we have mentioned in the primary grades, the subjects "Familiarization with the environment", "Labor" and "Sports" are also taught, this scheme can be expanded and we can talk about the interaction between the 7 subjects.

Subjects taught in primary school are often divided into primary and secondary subjects, which is a very harmful idea. In this sense, we show through the scheme that it is possible to establish interactions in the teaching of the above 8 subjects without distinguishing between the subjects taught in the primary grades. Thus, these subjects have a certain importance in the process of harmonious development of primary school students.

The main goal of school pedagogy in our sovereign country is to bring up individuals who are harmoniously developed, intellectually, spiritually, physically and aesthetically, mentally formed and developed, and able to appreciate our national values.

Art shines a light on expanding the boundaries of mental development and increasing knowledge. In the face of the process of training and education in modern society, along with the formation of artistic and aesthetic culture, the development of feelings, imagination and fantasy of the growing generation, as well as to influence their formation of worldviews, personal qualities and characters. In this sense, the teaching of mathematics, which is taught in our secondary schools and is difficult for most students to understand in relation to other subjects, in relation to aesthetic disciplines and mathematical concepts in works of art, has an impact on students' mastery of knowledge and feelings.

Discussions

The combination of intellectual and emotional learning in the modern education system can be the beginning of students' creative, free and comparative thinking skills, which can be very important in the lives of students and help them to determine their future skills.

As we know, perception is the basis of the learning process. Perception as a psychological concept has been studied by educators, methodologists and scientists since ancient times, and scientific research is being conducted today to make this process more mobile. In all these scientific researches, different ways are shown to make it easier for students to grasp knowledge. As a result of the correct organization of the psychological process of perception, schoolchildren, including primary school students, can acquire different qualities, as well as a set of knowledge enriched as a result of the interaction of different knowledge.

Clearly, the process of perception is somewhat similar to the process of dividing light into seven colors. That is, the math teacher clarifies the lesson to the children. Teachers and students are involved in this process. The teacher is active, and the students listen carefully. To make the listening process more interesting, the teacher uses difficult mathematical concepts to compare and relate to examples known to students from a variety of media, from aesthetically pleasing subjects, as well as fiction. As a result, students understand mathematical knowledge more easily. This process of perception affects the mental development of students, the formation of imagination, the growth of emotion, the emergence of worldview and a number of individual qualities, character and intellectual development. When these qualities are combined, the aesthetically enriched mathematical knowledge remains in the student's brain for a long time, and students can apply this knowledge in the future in a comparable way with other subjects.

There are also features of the teaching of mathematics related to the arts that, as a result of the education of students in modern times, also develop a number of the following qualities:

- a) abstract imagination;
- b) substantiation of opinions;
- c) persistence in the work process;
- d) perfection and accuracy in the work process;
- e) systematicity and regularity in the work process;
- f) responsibility for the result obtained;
- g) consistency, clarity, precision;
- h) simplicity and fluency of speech.

This can be attributed to the "emergence of individual qualities" shown in the model.

Given that each of the qualities in the proposed model is a separate research topic to be developed in the future, we do not disclose them. Also, the model as a whole can be developed as a very broad research topic.

The teacher must consider the characteristics of the students in carrying out such a process. That is, an example should be used that corresponds to the age characteristics of young students. This age period in pedagogy is called the period between childhood and adolescence. During this period, all the organs of movement and labor are formed, the child's body undergoes a process of intensive development. Therefore, during this period, students are more inclined to play, excursions, sports, physical labor than reading.

During this period, students prefer to memorize knowledge without understanding its content. Therefore, at this age, it should be the goal of every teacher to make extensive use of visual aids and works of art. Especially at this age, mathematics is very difficult for students to understand, and they have almost no interest in this subject. On the other hand, 6-7 year old students cannot sit on the same place for a long time.

A child who has just arrived at school suddenly becomes a member of a large team. He makes friends and companions at school. Therefore, the primary school teacher who teaches mathematics must always take into account these characteristics of young students and be able to direct their great energy and mobility to the process of mastering the subject in a purposeful way. On the other hand, during this period, as well as at other times, students differ from each other in their physical and mental development, abilities, interests, and character. That is, every child is a microworld. Without taking into account these differences, it is impossible to achieve success in the teaching process, especially in the teaching of mathematics. In general, if it is used taking into account people's actions, the perception of knowledge will be accelerated and it will be easier to master it.

Conclusions

Thus, theoretical research on the problem leads to the following conclusion:

1. Since interdisciplinary interaction is directly related to the process of perception, the problem related to the topic requires the study of both pedagogical and psychological sciences:
2. Although mathematics and other arts are taught collectively, the individual characteristics of each student must be properly studied by the teacher and taken into account in the teaching process.

3. The condition of the nervous system of primary school students should be periodically examined by school psychologists and the schoolchildren should be grouped according to the same type of the nervous system.

4. Given that interdisciplinary interaction is a powerful tool in accelerating the process of perception, primary school teachers should pay special attention to these issues.

5. It is necessary to ensure the high quality of the print outs of theoretical and practical (visual) means of interdisciplinary interaction.

6. It is advisable to organize speeches of leading teachers who have achieved good results in this field together with scientists-methodologists in the work of scientific-practical conferences on interdisciplinary interaction.

7. The work experience of advanced primary school teachers, who organize interdisciplinary interaction well in the teaching process, should be studied by scientists and methodologists, and the results of this work experience should be disseminated throughout the country.

8. In order for the problem of interdisciplinary interaction to be more effective, the lessons of teachers who have achieved positive results in this field should be videotaped and broadcast twice a month on national television.

9. As the problem of interdisciplinary interaction is not well studied scientifically in our country, it is necessary to create conditions for further special research based on pedagogical and psychological sciences.

The following may be concluded:

1. In ancient times in Azerbaijan, teachers, writers, scientists who taught in madrassas, schools, always tried to connect subjects in the teaching process.

2. Historical information through interdisciplinary communication should be carefully researched and put into a scientific system.

3. Historically, the positive aspects of interdisciplinary work in the teaching process in our schools should be clarified and the methodology of its use in the modern teaching process should be scientifically developed.

4. The textbook on the subject of "Pedagogy" taught in our higher pedagogical schools should reflect the topic of interdisciplinary communication and its history.

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