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# USE OF INTERDISCIPLINARY INTEGRATION IN IMPROVING THE EFFECTIVENESS OF ELEMENTARY SCHOOL SCIENCE AND MATHEMATICS LESSONS

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## ANNOTATION

The article examines the problems of interdisciplinary relations and interdisciplinary integration in primary education, its history and the views of foreign scholars and great thinkers of the Middle East, the reforms in the higher and secondary education system of the Republic of Uzbekistan. Also, the need for new strategic, tactical decisions for the organization and content of the primary education process, the search for effective ways to stimulate the interest of primary school students in science, the introduction of new approaches and technologies in the educational process. There are suggestions on the methodology of the course.

***Keywords: elementary school, strategic and tactical decisions, creative competence, innovative technologies, science integration.***

## INTRODUCTION

Analyzing the experience of development gained by the Republic of Uzbekistan during the years of independence, based on the principles of the ideas of national independence, the educational process as an important component of social life has also changed. This process began with the creation of the legal and educational framework of state policy in the field of education. Raising education to a high level on the basis of the ideas of national independence is a strong demand of our time and a social demand of society. Primary education is a complex and important part of the system of continuing education. depends on the answers obtained from historical sources to questions about which parts are related.

Today, one of the most important issues in the world is to increase the level of knowledge of primary school students on the basis of a competent approach to education, the creation of modern methodological support of the creative educational process through the development of creative competence of teachers, the development of science-oriented creative skills. being investigated. In this regard, it is important to further improve the pedagogical mechanisms for the development of creative abilities in primary school students on the basis of advanced foreign internationalization and modernization, the widespread application of methods and technologies in competencies.

Numerous scientific researches have been carried out by pedagogical scientists on the formation of professional training of students, the use of innovative educational technologies to increase the effectiveness of teaching. However, the study of pedagogical-psychological aspects, counter-aggressive, thesaurus and interactive factors; Improving pedagogical mechanisms for the development of creative abilities in students through interactive educational technologies and methods, the development of creatively oriented educational

programs, the development of prognostic and qualimetric methods of developing students' creative potential remain important issues of scientific, theoretical and practical importance.

There is a wide range of research in the world, including the use of innovative technologies in the teaching of all subjects related to mathematics and science, and thus ensuring the quality of education, developing students' creative abilities, increasing the effectiveness of practical applications of mathematics and career guidance. This, in turn, is of particular importance in the application of innovative strategies in the teaching of mathematics, increasing the activity of in-depth school students, independent learning and the widespread application of acquired knowledge in practice.

**Level of study**

The methodological bases of integration between disciplines were studied by CIS scientists VS Bezrukova [1], MN Berulava [2], VN Maksimova [3], VI Baydenko [4], TI Bondarenko [5 ] T.B.Kropocheva [6], A.Gabidulina [7] et al .; VE Medvedev [8], VN Fyodorova [9], N.A. Plugina [10], AO Syromyasov [11], VN Fyodorova on general theoretical problems of interdisciplinary relations and their organization [12] and others have suggested that interpersonal communication should be considered as a tool to increase the effectiveness of knowledge acquisition and as a condition for the development of cognitive activity, different approaches to defining the direction of modernization of the education system 14], M.V. Noskov [15] and others, who were engaged in the implementation of interdisciplinary integration in the educational environment.

## ANALYSIS AND RESULTS

The Republic of Uzbekistan is entering a new stage of socio-economic development. This, in turn, increases the requirements of the employer to the level of professional training of a mobile specialist, leads to an increase in demand for pedagogical staff who can perform practical tasks, work simultaneously on simple and complex processes, create innovative products of professional activity.

Such requirements are reflected in the "Concept of development of the higher education system of the Republic of Uzbekistan until 2030" [16], which states that setting priorities for systemic reform of higher education in the Republic of Uzbekistan, training highly qualified personnel with modern knowledge and high moral qualities. it is necessary to raise the process to a qualitatively new level, modernize higher education, develop the social sphere and the economy based on advanced educational technologies.

Of course, such requirements have a direct impact on the purpose, content, and procedural aspects of both primary education. It is necessary to reveal the hidden, backup possibilities of the educational process, its content and methodological aspects, to fill it with the necessary competencies, high general culture, independent acquisition of new knowledge, information flow, formation of a person ready to learn new techniques, technologies and materials.

At present, the implementation of these requirements within the framework of traditionally established “science” training is not effective enough. New strategic and tactical decisions are needed for the organization and content of the primary education process. Stimulating the interest of primary school students in science, the search for effective ways to improve the quality of training leads to the introduction of new approaches and technologies in the educational process, the integration of content and procedural basis. The qualitative change in the activities of the employee in this regard is associated with the use of new materials, the widespread introduction of information technology in practice, the use of modern technologies, using social and special powers in his work.

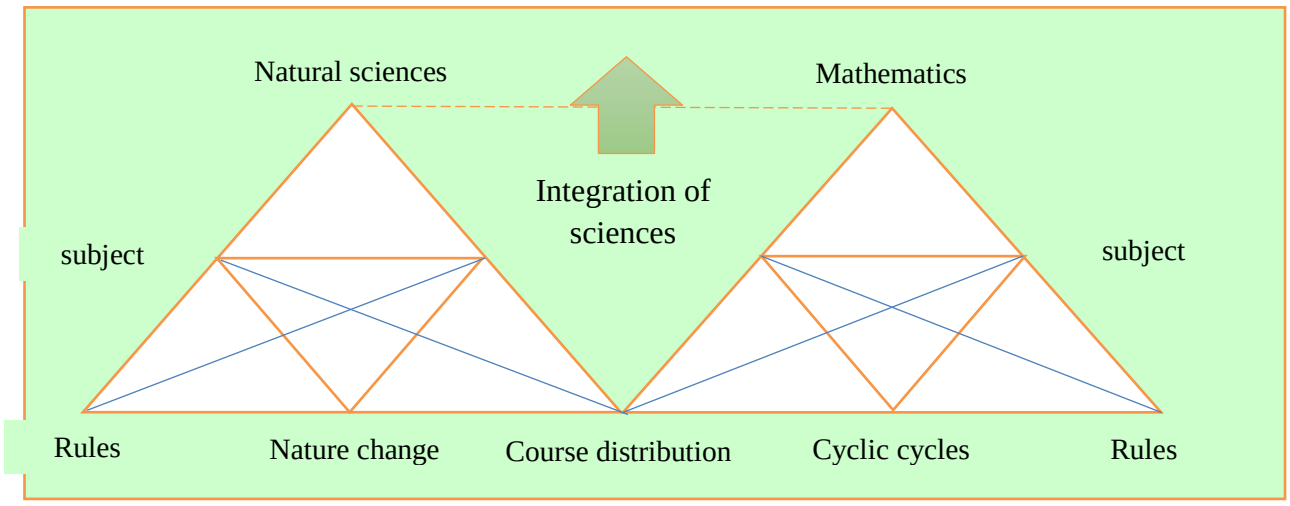
The chosen topic is related to the modern level of development of science, in which the combination of social, humanities and natural sciences is clearly expressed; is determined by the compliance of complex requirements, such as educating the younger generation, arousing their interest in science; is determined by the specifics of the modern priorities of the development of the process of primary education and the laws of cognitive activity of students.

Attempting to explore the hidden, backup potential of the primary school process by combining the content and methodological aspects of science and mathematics, using this potential to improve the quality of student training provides not only scientific interest but also real pedagogical effect, which draws teachers' attention to the competency model of the learning process. allows for practice-oriented training.

The problem of interdisciplinary relations and interdisciplinary integration in education has a long history in pedagogy, but in a competency-based approach it acquires a new meaning. Methodist educators at different times linked the teaching of science and mathematics with its nature and its social system and schools. determined according to their general functions. The theory and practice of the great thinkers of the Middle East, Khorezmi, Farobi, Ibn Sino, confirm that the knowledge acquired in the process of forming a child's independent creative ability has a great advantage compared to knowledge obtained from a single source. This knowledge, which develops more fully and faster, becomes a belief of the students and a tool to sharpen their thinking and active practical-creative abilities.

As a result of reforms in science, education and industry in our country, the educational system, along with all other disciplines, is updating the low educational and regulatory documents, the material and technical base of mathematics. As a result of the introduction of computer-based teaching methods, students' interest in mathematics is growing, and the training of qualified and competitive personnel for the real sector of the economy is being achieved. Naturally, there is a need for teachers to pre-design the learning process for teaching mathematics based on the use of such innovative methods. Measures to further develop mathematics education have identified the task of "... in-depth study of stable and high-demand subjects such as mathematics, physics, chemistry, biology, computer science and foreign languages" [17].

In view of these tasks, in order to increase the interest of the younger generation in mathematics and to integrate it with other disciplines, in our opinion, it is expedient to propose a methodology based on the integration of science and mathematics in primary school (Figure 1).




Author's development based on research results

**Figure 1. Teaching methods based on the integration of natural sciences and mathematics in primary school**

The methodology shown in Figure 1 is that the subjects are selected by ensuring that the mathematical laws are linked according to certain rules in accordance with the change in nature within the subject matter. In this regard, the greatest responsibility placed on the teacher is to focus on the division of the lesson in explaining the topic. Research shows that it is advisable to add a part of science to the subject of mathematics, which leads to the development of students' interest in mathematics and interest in science.

The methodology considered requires the systematic study of the literature related to education in the integration of natural sciences and mathematics and the preliminary review of this literature. In a general sense. even if it is not directly related to all interdisciplinary literature and mathematics education, the coverage of literature may be relevant to a certain extent to all selected topics related to the history of sciences, school sciences, and curriculum structure.

At the same time, it is often useful to study the broader systems of practices or concepts that make up the object of study, as the relationship of the object in the broader system mediates and constructs it. Considering these broader related problems will help you gain a deeper understanding of the "interdisciplinary and mathematical learning" object. Although this is a common point, it seems very appropriate to discuss an interdisciplinary issue. Yet this topic in itself reveals certain problems and challenges.

## CONCLUSION

The combination of math and science teaching makes it easier for students to learn, be active, motivate, solve problems, take a critical approach to processes, and apply them in life. At the same time, the implementation of an integrated approach in the teaching of both subjects in primary school leads to the awakening of students to work collaboratively, to think broadly and to think freely. Also:

- The content of the concepts of integration and creativity helps to determine the pedagogical and psychological features and factors of the level of development of creative abilities of the individual;

- Based on the competency approach, the criteria and mechanisms for determining the development of creative abilities of primary school students in science and mathematics will be improved;

- allows to assess the experimental level of development of creative abilities of primary school students through interactive teaching methods and technologies in science and mathematics and its effectiveness;

- Improving the integrated methodological system for the development of creative abilities of primary school students in science and mathematics through interactive teaching methods and technologies;

- through interactive teaching methods and technologies, scientifically based proposals and recommendations for integration in the development of creative abilities of primary school students in science and mathematics.

## REFERENCES

1. Bezrukova, VS Integration processes in pedagogical theory and practice [Text] / VS Bezrukova. - Yekaterinburg, 1994 .-- 152 p.
2. Berulava, MN Integration of educational content [Text] / MN Berulava. - M .: Pedagogy, 1993 .-- 172 p.
3. Maksimova, VN Interdisciplinary communications in the educational process of a modern school [Text]: textbook. manual for stud. ped. in-tov / V. N. Maksimova. - M .: Education, 1987 .-- 160 p.

4. Baydenko, VI New approaches to the development of educational standards in the field of primary and secondary vocational education // University management. 2000. No. 1 (12). S. 19-22.
5. Bondarenko, TI Methodological features of teaching algebra in basic school in the context of a personality-oriented approach [Text]: dis. ... Cand. ped. Sciences / T. And Bondarenko. - M, 2000 .-- 208 p.
6. Kropocheva TB The system of preparing the future teacher to activate the educational process in primary school [Text]: author. dis. ... Cand. ped. Sciences: 13.00.08 / T.B. Kropocheva - Moscow, 2010 .-- 24p.
7. Gabidulina, A. Integrated lesson: X grade [Text] / A. Gabidullina // Public education. - 1990. - No. 12. - S. 54-56.
8. Medvedev, V, E. Didactic foundations of intersubject connections in the professional training of future teachers (on the example of natural science and technical disciplines) [Text]: dis. ... Dr. ped. Sciences: 13.00.08 / V.E. Medvedev. - M., 2000 .-- 380 p.
9. Interdisciplinary communications of natural mathematical disciplines (collection of articles) [Text]: a guide for teachers / ed. V.N. Fedorova. - M .: Education, 1980 .-- 206 p.
10. Plugin, N. A. Interdisciplinary relations in the development of integrative natural science concepts among university students [Text] / N.A. Plugin // Integration of education. - 2009. - No. 3. - S. 60-65.
11. Syromyasov, A. O. Interdisciplinary relations in teaching mathematics to students of non-mathematical specialties [Text] / A. O. Syromyasov // Integration of education. - 2008. - No. 4. - S. 64-67.
12. Fedorova, VN Intersubject communications [Text] / VN Fedorova, DM Kiryushkin. - M .: Pedagogika, 1989 .-- 273 p.
13. Tryapitsyna, A.P. Modernization of general education: self-education of an innovative school teacher. SPb .: Beresta, 2002.
14. Tyunikov, Yu. S. Bank of ideas. Modernization of the educational process [Text] / Yu. S. Tyunikov, LA Artemyeva // Specialized secondary education. - 1991. -No. 12. - P.17 - 19; 1992. -No. 1.-S. 16-18; No. 2.-C. 14-16.
15. Noskov, MV Interdisciplinary integration in the context of a competence-based approach [Text] / MV Noskov, VA Shershneva // Higher education today .. - 2008. - № 9. - P. 23- 25.
16. Decree of the President of the Republic of Uzbekistan "On approval of the Concept of development of the higher education system of the Republic of Uzbekistan until 2030" dated October 8, 2019, No. PF-5847. https://lex.uz/docs/4545884
17. Resolution of the President of the Republic of Uzbekistan dated July 9, 2019 No PK-4387 "On state support for the further development of education and science of mathematics, as well as radical improvement of the Institute of Mathematics named after VI Romanovsky." National database of legal acts of the Republic of Uzbekistan, 2019, No. 07/19/4387/3397.