

THE IMPORTANCE OF INTERDISCIPLINARY HARMONIZATION (INTEGRATION) IN MATHEMATICS LESSONS

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Abstract

This article covers the theoretical and practical foundations of interdisciplinary integration in mathematics lessons. The importance of an integrated approach in developing students' knowledge, thinking, and skills in solving life problems is analyzed. In particular, the inextricable link between mathematics and physics, computer science, geography, biology, and technology is revealed through examples. Also, effective methods for organizing interdisciplinary lessons are considered - a project-based approach, integrated lessons, and cross-curricular connections. The article proves the positive impact of integration on the quality of education through practical examples taken from real lessons. The results of the study serve as an important scientific and practical basis for the effective organization of mathematics lessons and improving the methodological approach based on modern educational requirements.

Keywords: Integration, interdisciplinary connection, mathematics, harmonization, didactics, modern education.

Introduction

In modern education system, interdisciplinary integration is recognized as an important way to control the load of the educational process and connect students with real life. By linking abstract subjects such as mathematics with other disciplines, the degree of student support, motivation, and appreciation of knowledge is increased. Three articles consider the interdisciplinary harmony of mathematics lessons, practical examples and methods of its implementation.

Interdisciplinary harmonization is the process of defining a holistic learning environment by combining knowledge and vision from different disciplines. In math lessons, it's connecting mathematical concepts through the implementation of other disciplines, such as physics, biology, economics, or the arts. For example, statistical analysis methods can be used in biology to study population dynamics or to determine symmetry in geometric shape art. Mathematics is often perceived as an abstract and dry subject for students. Through interdisciplinarity, mathematical understandings are applied to real-life problems, where students find the disciplines more interesting and meaningful. For example, studying income accounting in economics or analyzing it using mathematical models can develop motivation in students.

1. **Develop critical thinking:** Interdisciplinary helps to solve the problem from different perspectives depending on oneself. For example, the application of statistical methods in the analysis of climate measurement data can change students' analytical and creative thinking.

2. **Real-Life Connection:** In mathematics lessons, interdisciplinary integration makes the application of knowledge in a practical context. For example, income accounting in independence or engineering geometric modeling shows students the importance of mathematics in everyday life. **Often** it takes work. It develops students' development of collaboration, communication, and responsibility. For example, developing mathematical models of economic strategies in a group project strengthens teamwork.

3. **Adaptation in the modern job market:** Modern occupations often require knowledge of more than one discipline. Interdisciplinary harmonization prepares students for future professions as they learn to combine knowledge from different fields.

4.

Practical Examples

Integration of Mathematics and Biology: Students learn to make up mathematical equations using a population growth model. For example, it is possible to study the system of biological systems by analyzing a logistical growth model.

Integration of Mathematics and Economics: The application of interest calculus or statistical analysis methods in market analysis to determine the methods of statistical analysis can help students increase economic opportunities.

Integration of Mathematics and Art: Develops creative design in students using geometric shapes and symmetry designs in art, such as mosaic designs or architecture. Readers have access to real-life problems. For example, the output of mathematical models to optimize urban transport. Mathematics teachers develop lesson plans in collaboration with teachers of other subjects. For example, together with a physics teacher, analyze equations of motion by mathematical methods. Interdisciplinary implementation through technological computer programs or simulation. For example, From the GeoGebra program, linking mathematical functions to physical processes. **Study forms of harmony between mathematics and other disciplines.**

Mathematics + Informatics

Algorithmic thinking, coding, visualization of functions, constructing graphs - these are all aspects related to computer science. Mathematical problem modeling in tools like Scratch, Python, and so on makes the integration even harder.

Mathematics + Geography

Geographical knowledge is deepened by analyzing statistical data, working with scales on maps, and creating graphs and diagrams.

Mathematics + Biology

It is possible to explain the processes observed in biology through topics such as mathematical probabilities, percentages, population growth models, etc.

Mathematics + Technology (labor lessons)

Allows creating projects based on measurements, proportions, drawing up a plan, scales.

Conclusion

The project-based approach is the development of a project, including several subjects on a particular topic.

An integrated lesson is a lesson in which two teachers of disciplines participate at the same time. **Knowledge** learned in one subject is strengthened in another.

Interdisciplinary harmony in mathematics lessons makes the educational process more effective, interesting and practical. These students develop critical thinking, action-oriented and teamwork skills and prepare them for the modern job market. Teachers can control the quality of education by actively applying interdisciplinary assistance in the classroom.

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