DEVELOPING STUDENTS' SCIENTIFIC WORLDVIEW THROUGH THE HISTORICAL FORMATION OF MATHEMATICS.

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Abstract: *This article provides an extensive explanation of the theoretical and practical aspects of developing students' scientific worldview on the basis of the historical origins of mathematics. The integration of the history of mathematics into the educational process is scientifically substantiated as an important factor in fostering logical thinking, reasoning based on the scientific method, understanding cause-and-effect relationships, and developing analytical skills. The research is organized according to IMRAD requirements and examines the emergence of mathematics as a response to practical needs in ancient civilizations, the influence of Eastern and Western scholars' heritage on the scientific worldview, as well as the didactic opportunities of using historical materials in teaching.*

Keywords: *history of mathematics, scientific worldview, logical thinking, historical method, algorithmic thinking, didactics.*

INTRODUCTION

Mathematics is one of the oldest and most sophisticated products of human thought. Its development is closely connected with social progress, practical needs, and socio-economic demands, and its formation as a science is the result of a long historical process. Today, mathematics is considered one of the most effective tools for shaping students' scientific worldview. The emergence, development, and transition of mathematics into a theoretical system embody the main principles of scientific thinking, such as logic, objectivity, consistency, evidence-based reasoning, and abstract thought.

The development of a scientific worldview involves the ability of learners to approach events and phenomena using scientific criteria, analyze facts, understand causal relationships, and apply the scientific method. Studying the history of mathematics contributes significantly to the development of these competencies. Mathematical ideas never emerged suddenly or by accident; instead, they evolved over long periods through scientific inquiry, observation, practical experience, and logical reasoning.

Therefore, integrating the content of mathematics history into the learning process not only deepens mathematical knowledge but also strengthens students' scientific

worldview, enhances their interest in scientific inquiry, promotes interdisciplinary thinking, and develops methodological reasoning.

Methods. In the research process, methodological and historical materials contributing to the formation of a scientific worldview were studied systematically. First, scientific sources on the history of mathematics were analyzed using the historical-analytical method, examining the conditions under which mathematical ideas emerged in different periods, as well as their practical and theoretical significance. Pedagogical analysis was applied to evaluate the influence of teaching mathematics history on students, the didactic conditions, and the methods used in the learning process.

A comparative method was used to examine the development of mathematical ideas across different civilizations, their application in the educational process, and their impact on shaping students' worldview. Practical observations were also carried out to study how lessons incorporating the history of mathematics affect students' engagement, thinking processes, and motivation. The effectiveness of methods such as problem-based learning, historical tasks, integrative approaches, and modeling was evaluated from a didactic standpoint.

Analysis of Results. The findings show that the history of mathematics possesses significant pedagogical potential for developing students' scientific worldview. Historical materials related to the origins of mathematical concepts help learners understand the socio-evolutionary nature of scientific knowledge. For example, the mathematics of ancient Egypt and Babylon emerged due to practical needs such as land measurement, trade, and taxation—demonstrating for students the role of science in societal development.

The creation of the decimal system and the concept of "zero" in India, the computational methods in China, and the emergence of Euclidean geometry in ancient Greece all illustrate the historical evolution of scientific thinking. Such materials strengthen students' abilities to understand cause-and-effect relationships, draw conclusions based on observation and analysis, and reason logically.

The heritage of Eastern scholars has a particularly strong impact on learners. Al-Khwarizmi's principles of algebra and algorithmic thinking form the foundation of modern information technologies. Mirzo Ulughbek's astronomical observations and contributions to trigonometry demonstrate that scientific inquiry requires rigorous effort, persistence, and precision. These examples shape students' respect for science, motivation for learning, and readiness for intellectual exploration.

The research shows that lessons incorporating the history of mathematics enable students to understand mathematical concepts more deeply, connect theoretical knowledge with practical experience, and actively apply scientific thinking operations such

as analysis, synthesis, generalization, and logical inference. This process significantly contributes to the development of a scientific worldview.

Integrating the history of mathematics into the learning process creates broad opportunities for shaping students' scientific worldview. The historical approach allows learners to understand how mathematical knowledge emerged in response to human needs, what scientific problems it aimed to solve, and by which methods it developed. This fosters interdisciplinary thinking in students.

The formation of a scientific worldview requires logical thinking, analytical reasoning, evidence-based judgment, and objectivity. Working with historical materials teaches learners to draw conclusions based on facts and justify their opinions with scientific evidence. For example, analyzing the application of the Pythagorean theorem in different civilizations demonstrates the universality of mathematical ideas.

Another advantage of using the history of mathematics is increased student motivation. Many learners find mathematical formulas and theories abstract; however, understanding their historical roots brings the content to life and demonstrates its practical necessity. This approach raises students' interest in mathematics and helps them grasp its essence more deeply.

Creating problem situations, solving historical tasks, and using ancient computational tools encourage active thinking. Students begin to recognize the practical-social functions of mathematics and appreciate the nature of scientific inquiry.

Conclusion. The research results show that the history of mathematics is a powerful didactic tool for shaping students' scientific worldview. Using historical materials develops logical thinking, understanding of causality, objective reasoning, analytical skills, and the ability to draw scientific conclusions. The historical origins of mathematics expand learners' perception of the social necessity of knowledge, the continuity of scientific development, and the evolutionary nature of human thought.

Thus, integrating the history of mathematics into the learning process deeply fosters students' scientific worldview, directs them toward scientific inquiry, and positively influences their attitude toward mathematics.

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