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THE ROLE OF MATHEMATICS IN PREPARING ACADEMIC LYCEUM STUDENTS FOR HIGHER EDUCATION

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Abstract. *This article highlights the role and importance of mathematics in preparing academic lyceum students for higher education. It also analyzes the pedagogical potential of mathematics in developing students’ logical thinking, analytical reasoning, problem-solving abilities, and professional competencies. The article discusses the effectiveness of teaching mathematics through modern pedagogical technologies, organizing independent learning, and applying innovative methods during the preparation process for higher education. Furthermore, scientific and methodological recommendations are provided to enhance the theoretical and practical significance of mathematics education in academic lyceums.*

Keywords: *Mathematics education, academic lyceum, higher education, competency-based approach, logical thinking, analytical reasoning, innovative technologies, independent learning, pedagogical methods, educational effectiveness.*

Main Part

In today’s era of globalization and rapidly developing digital technologies, the demands placed on the education system are steadily increasing. In particular, preparing academic lyceum students effectively for higher education has become one of the most important tasks of modern education. In this process, mathematics plays a special role. Mathematics is not only a subject aimed at performing accurate calculations, but also an important tool for developing students’ thinking abilities, logical reasoning, and analytical skills.

Teaching mathematics in depth in academic lyceums serves as a crucial factor in strengthening students’ readiness for higher education. In higher education institutions, mathematics acts as one of the core subjects in fields such as engineering, economics, information technologies, medicine, and natural sciences. Therefore, acquiring solid mathematical knowledge during academic lyceum studies directly influences students’ future academic success.

One of the main objectives of mathematics education is to develop logical thinking and analytical approaches among students. While solving algebraic expressions, equations, functions, geometry, and probability-related problems, students gain the ability to think independently, analyze problems, and draw accurate conclusions. This becomes an essential foundation for mastering complex theoretical subjects in higher education.

The use of modern pedagogical technologies and innovative teaching methods in mathematics classes at academic lyceums significantly increases educational effectiveness. In particular, interactive methods, problem-based learning, project-based learning, STEAM approaches, and information and communication technologies increase students’ interest in lessons. Electronic platforms such as GeoGebra, Desmos, and Wolfram Alpha help students understand mathematical processes visually and facilitate the comprehension of complex topics.

Organizing independent learning in mathematics is also highly important in preparing students for higher education. Through independent study, students develop skills in working with additional literature, solving test assignments, independently completing complex mathematical problems, and conducting elements of scientific research. This process helps students adapt more easily to the independent learning environment of higher education institutions.

Furthermore, strengthening the practical orientation of mathematics education is essential.

By solving real-life mathematical problems, performing economic calculations, technical modeling, and statistical analysis, students begin to better understand the significance of mathematics in everyday life and professional activities. As a result, their motivation and interest in the subject increase.

The effective organization of mathematics education in academic lyceums also depends greatly on the methodological competence of teachers. Teachers should be able to apply modern pedagogical approaches, provide differentiated assignments according to students' individual abilities, and encourage independent thinking. Especially in preparing students for university entrance examinations, the effective use of test technologies and problem-solving tasks produces significant results.

Conclusion

In conclusion, mathematics is one of the most strategically important subjects in preparing academic lyceum students for higher education. This subject contributes to the development of students' logical thinking, analytical reasoning, independent decision-making abilities, and professional competencies. Teaching mathematics effectively through modern pedagogical technologies, interactive methods, and information and communication tools serves as a key factor in improving the quality of education. Moreover, integrating mathematics with practical applications, developing independent learning, and widely implementing innovative approaches can further enhance the academic success of academic lyceum graduates in higher education.

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