UTILIZING PROBLEM-BASED LEARNING TECHNOLOGY IN DEVELOPING STUDENTS' COMPETENCIES IN COMPUTER GRAPHICS

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Abstract. *This article offers suggestions and recommendations for utilizing problem-based learning technology to develop students' competencies in computer graphics at the secondary school level.*

Keywords: *competence, problem-based learning, information technology, raster, vector, computer graphics*

The use of problem-based learning (PBL) technology has been found to be effective in enhancing the teaching of raster and vector graphics in general secondary education. Additionally, it contributes to increasing students' motivation and creativity, while fostering their competencies in preparing various graphic projects.

The essence of problem-based learning lies in creating and organizing problem situations, which are then addressed through collaboration between students and teachers. This approach places significant emphasis on students' independent work, such as critical thinking, problem-solving, and other related activities. PBL can be applied to the assimilation of generalized knowledge, including concepts, rules, laws, cause-and-effect relationships, and other logical connections. It serves as a specialized method aimed at teaching students the mental techniques and methods necessary for solving cognitive and research-oriented problems [1].

Therefore, problem-based learning technology is regarded as a crucial pedagogical approach for enhancing the effectiveness of subjects taught in general secondary education, particularly in the area of "Informatics and Information Technologies". It plays a vital role in developing students' competencies related to information technology.

In this regard, according to T.Yu. Ilina [2] and O.A. Prusakova [3], problem-based learning technology serves as a crucial pedagogical approach in enhancing the effectiveness of teaching computer science and information technology subjects in secondary schools. They argue that PBL is essential for developing students' personally significant qualities, especially creative thinking and cognitive activity in the context of information technology.

Similar conclusions are drawn by O.A. Prusakova [4], U.M. Mirsanov [5], and K.N. Djumabayev [6], who have highlighted several key advantages of PBL in teaching "Informatics and Information Technologies" at the secondary school level: “Problem-based learning technology not only enables students to achieve a high level of intellectual development in the field of information technologies but also creates the opportunity to acquire the necessary volume of knowledge, skills, and abilities related to it. It nurtures an active, creative personality in students who can solve non-standard educational problems in

the field of informatics and information technologies. Furthermore, it develops the ability to independently acquire knowledge in the field of information technologies and organize information activities through their own creative endeavors». Moreover, it «stimulates interest in educational and information activities; ensures solid educational outcomes; fosters students' ability to systematize, analyze, and apply knowledge and skills acquired through active research in information technology, including the use of the global Internet, to study and solve emerging problems; cultivates the ability to apply existing knowledge, skills, and competencies in the field of informatics and information technology to real-life situations; and enhances students' creative abilities in the realm of information and communication technologies».

Based on the presented analyses, it can be concluded that in teaching computer graphics-related topics, problem-based learning serves as a strategy for organizing educational and communicative activities. This approach encourages independent research for knowledge acquisition through solving problem tasks. Therefore, to achieve effective results in these circumstances, it becomes necessary to find the optimal combination of educational materials and teaching methods.

It is important to note that not all materials related to computer graphics can be used to create problem-based learning situations. Non-problematic elements of educational content include numerical data, facts, dates, and other similar information.

Consequently, the use of problem-based learning technology is seen as an effective means for developing students' competencies in the field of computer graphics.

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