THE EFFECTIVENESS OF PERSONALIZED LEARNING IN DEVELOPING STUDENTS` COMPETENCIES IN COMPUTER HARDWARE AND SOFTWARE

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ARTICLE INFORMATION

ARTICLE HISTORY:
Received: 16.05.2026
Revised: 17.05.2026
Accepted: 18.05.2026

KEYWORDS:
personalized learning, hardware and software, 3D technology, video-based lesson.

ANNOTATION

This article presents recommendations for the use of personalized learning in the development of students` competencies related to computer hardware and software.

In the context of contemporary globalization, there is an increasing need to develop innovative approaches to fostering students` competencies across subjects, including computer hardware and software, in general secondary education. Personalized learning can be considered as a modern approach to developing students` competencies in computer hardware and software.

To overcome these challenges, it is essential to identify the key principles that shape students` logical, creative and cognitive thinking in relation to computer maintenance, to implement innovative approaches to teaching methods, and to clarify, and where necessary, improve the principles underlying the enhancement of instructional effectiveness.

Based on the analysis of the conducted studies, the development of students` competencies in computer hardware and software in general secondary education imposes new requirements in both information technology and didactic aspects. Therefore, it is necessary to enhance didactic principles in teaching informatics and information technology subjects, as well as, in fostering students` logical and algorithmic thinking and developing their competencies in information and communication technologies.

- To define and clarify the content of the concepts “personalized learning”, “individual learning program”, and “3D modeling technology” in order to involve students in conscious scientific research activities and supporting their professional self-determination;
- To characterize the didactic principles underlying the integration of 3D modeling technologies in order to support personalized learning and enhance the quality of educational outcomes;
- To develop approach concepts that reflect the necessary changes in teaching methods and organizational forms in order to consciously engage students in solving constructive educational and professional tasks;
- To propose methodological techniques and recommendations for the organization of research activities in 3D modeling design, considering individual characteristics;
- To take into consideration students` age-related and psychological characteristics, along with the specific nature of creative activity;
- To experimentally confirm the effectiveness of recommendations for increasing students` conscious participation in solving learning and professional tasks and improving the overall effectiveness of teaching.

These approaches make it possible to develop students` competencies in computer maintenance. However, the present study focuses on the development of students` competencies in both computer hardware and software. Therefore, it is considered appropriate to use multimodal 3D-format learning resources for developing students` competencies in computer hardware. In contrast, video-based lessons should be applied to develop students` competencies in software.

According to A.M. Ahmedova and G.Z. Khabibulina, the use of video lessons in “Informatics and Information Technologies” classes enables the convenient transformation of learning materials [1]. Learning through video lessons is considered more engaging and effective than reading text materials. Therefore, video lessons provide the opportunity to access learning at any time and from any from any place [2].

At the same time, video lessons create opportunities for continuous learning without leaving home. In teaching informatics and information technologies, the use of video lessons serves as an important pedagogical software tool for working with various application programs, programming languages, as well as for the development of different practical projects.

In this regard, research has also been conducted by Mara Saeli [3], Anthemis Raptopoulou [4], D.A. Gatovskaya [2], and K.N. Djumabaev [5]. According to their views, the use of video lessons is considered effective in developing students` logical thinking in the field of information technologies.

Based on the conducted theoretical analysis, it can be stated that the of global network-based virtual learning technologies 3D-format learning tools, and video lessons is appropriate for developing general secondary school students` competencies in computer

hardware and software. The learning process through these tools is aimed at systematizing students` creative activities, ensuring the expansion of social experience, and improving overall development in terms of quality. In general, there are two main didactic approaches to their use. The first approach imitates traditional group learning activities organized in the form of electronic teleconferences and forums. In this approach, general secondary school students independently study topic-related information, as a rule, from textbooks or from specified global network resources. Based on this, the comprehension and consolidation of knowledge are carried out during group work in a virtual classroom setting.

This approach requires high-speed electronic communication lines and the availability of a wide range of educational resources within the information and educational environments of educational institutions. The second approach is focused on students` independent learning activities through the use of didactic electronic learning resources designed for global networks and developed on the basis of methodological, psychological, psychophysiological, and technical principles, and tested in practice. The use of these tools makes it possible to organize various types of students` independent work.

In general conclusion, the use of personalized learning is considered appropriate for the development of students` competencies in computer hadware and software.

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