

FUNDAMENTAL APPROACHES TO DEVELOPING STUDENTS' COMPETENCIES IN COMPUTER HARDWARE AND SOFTWARE SYSTEMS

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Anotation. *This article explores the fundamental principles used in developing students' competencies related to computer hardware and software, along with their capabilities.*

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In recent years, the rapid progress in informatics and information technology, together with the continuous improvement of computer application software, enhancing students' competencies in computer hardware and software has become one of the key contemporary issues.

Overcoming these challenges requires identification of fundamental principles that define the development of students' logical, creative, and cognitive thinking in the context of computer maintenance, the integration of innovative teaching approaches, and the clarification – if needed, improve – the principles that contribute to the effectiveness of the educational process.

Based on the analysis of the research undertaken, the formation of general secondary school students' competencies in computer hardware and software generates new demands in both information technology and

didactics. Therefore, it is necessary to improve didactic principles in teaching informatics and information technologies and in fostering their competencies.

For this reason, the present research advances and refines the principles applied in developing general secondary school students' competencies in information technologies, particularly in computer hardware and software:

- *The principle of integrating education with real-life.* This principle is based on the conceptual framework of philosophical, pedagogical, and psychological principles in the teaching of computer hardware and software systems.
- *The principle of scientific teaching.* It specifies the scientific basis for teaching computer hardware and software to students and entails the inclusion of not only traditional scientific knowledge and primary sources but also the fundamental principles of science and its development prospects.
- *The principle of accessibility.* In the teaching of computer hardware and software, this principle allows learners of a specific age group to move from collective use to individual use in achieving educational goals.
- *The principle of presentation-based instruction.* This principle supports the development of students' cognitive thinking and competencies through the demonstrating objects, processes, and phenomena related to computer hardware and software, and enables visual learning opportunities.
- *The principle of systematization and consistency.* It is connected both with the structuring of educational material and with the system of learners' activities and its acquisition.

The above-mentioned principles are of significant importance in the formation of general secondary school students' competencies in computer hardware and software. Nevertheless, topics related to computer hardware and software are closely linked to changes in the basic didactic principles of education. Thus, in the process of forming students' competencies in computer hardware and software, it is essential to comply with the above-mentioned principles together with the following:

- *The principle of motivation for learning.* It is based on the learner's internal need to develop cognitive thinking in the field of digital technologies.
- *The principle of individual learning.* It implies the organization of learning and cognitive activities based on students' individual abilities and capacities.
- *The principle of ensuring openness and adaptability.* It ensures that educational materials are not overly complex in theoretical and scientific perspective.
- *The principle of interactivity.* In a broad sense, this principle encompasses the interaction between any subjects and the use of available tools and methods for this purpose.
- *The principle of structuring the educational process on the basis of activity and cognitive perspective.* This principle facilitates students' effective preparation for acquiring new material, enhance their cognitive activity, increases learning motivation, and fulfills other pedagogical functions.
- *The principle of learning through independent search for subject-related information.* This principle implies that students acquire knowledge by independently searching for information.

- *The principle of problem-based and development education.* It involves the formation of problem situations in students' thinking by means of a gradual sequence of increasingly complex tasks or questions.
- *The principle of self-assessment and self-regulation.* It implies that students independently assess and control their own learning activities related to assembling and configuring computer devices, as well as installing and configuring software applications.
- *The principle of durability and effectiveness of learning outcomes.* This principle involves improving the knowledge, skills and competencies acquired in lessons on computer hardware and software.
- *The principle of integration between theory and practice.* It requires the use of theoretical knowledge obtained in lessons on assembling and configuring computer devices and installing application and instrumental software during extracurricular time.

In conclusion, the principles discussed above facilitate the development of general secondary school students' logical, creative and cognitive thinking, and contribute to the formation of their competencies hardware and software.

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