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Didactic Possibilities for Developing Students' Cognitive Activity in Physics Lessons Using Media Technologies

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Abstract: This article analyzes the didactic possibilities of media technologies in increasing cognitive (cognitive) activity of students in physics classes. In the modern educational process, through digital tools and interactive platforms, students' interests in physics will increase and they will be able to gain a deeper understanding of the subject. With the help of Media technologies, it is possible to organize classes in a more interactive and dynamic way, to develop students ' independent thinking and analysis skills.

Keywords: Media technologies, physics education, didactics, cognitive activity, reading, teaching, reader, teaching materials, methodology.

Introduction: Nowadays, the role of information and communication technologies, in particular media technologies, in the educational process is increasingly increasing. Especially in teaching complex natural sciences such as physics, media technologies are emerging as an important tool not only to increase students' interest in the lesson, but also to develop their cognitive (cognitive) activity. When analyzing the didactic possibilities of developing students' cognitive activity using media technologies in teaching physical sciences, it is first necessary to clarify the meaning of the word didactics. The word didactics is derived from the Greek term "didacticos" and means "to teach", "to teach", "to educate".

In teaching physics lessons, based on the basic law of didactics - the law of unity of learning and teaching, the educational process should be considered from the

point of view of the mutual unity of the teacher and students. Therefore, taking into account the connection between methodology and didactics, the methodology of teaching subjects is often considered a special case of didactics. Therefore, any subject teacher must be well versed in didactics, the theory of learning, which is the main part of pedagogy. Because, in order to introduce innovations in any subject into the educational process, they must first be redeveloped from a didactic point of view, and then they become educational material. Another important task of didactics of teaching physics is to arm students with the didactic and methodological foundations of the educational material being taught. For this, students must be well versed in the philosophical foundations of physics and be able to interpret them.

Didactic opportunities for developing students' cognitive activity in physics lessons using media technologies are understood as methodological, pedagogical and technical opportunities available for the effective organization of the educational process and the development of students' knowledge, skills and competencies.

METHODS

Many scientists of our country have conducted research on the application of modern media technologies in the educational process.

J.A. Khamidov conducted scientific research on the technology of creating and using modern didactic tools in the training of future vocational teachers, and revealed a conceptual approach to teaching general vocational subjects based on modern didactic tools, the scientific and pedagogical foundations of creating modern didactic tools and using them [2].

According to X.A. Toraqulov, “Information technologies are a set of systems and applications that are regulated and organized by the use of computers and telecommunications to collect, process, store, represent, systematize, transfer information and make it user-friendly in order to find solutions to specific system problems” [7].

O.X. Toraqulov also conducted systematic research in this area. In his research, “the organizational and structural form and model of the information-based educational environment, text materials, digital educational programs, mathematical models, multimedia teaching materials for the studied educational direction, a package of applied programs, teaching and methodological materials of the studied subject, the option of choosing the most convenient option for teaching, innovative components, software platforms for teaching practical and laboratory exercises were analyzed and studied” [6].

In addition, our Uzbek scientists paid special attention and definition to information technologies, which are the basis of modern media technologies.

I.Kh. Nasriddinov and A.R. Khodjaboyev emphasize that the concept of information technologies includes, along with computer technologies, technical innovations and artificial intelligences that are currently developing. [4; 8].

According to A.A. Abdukodirov, the use of computers in the classroom creates new and unique conveniences for teachers and students associated with interactive textbooks. It is necessary to achieve that students accept them with interest, knowing modern programming languages for interactive textbooks created by the teacher. The operational integration of a computer with other teaching aids, such as a projector, electronic whiteboards, increases the volume of information provided using visual aids, thereby creating an opportunity for the teacher to use class time more effectively [1].

RESULTS

In order to improve the didactic possibilities of developing students' cognitive activity using media technologies in teaching physics and to develop appropriate teaching technologies for them, and ultimately to further increase the effectiveness of the educational process, it is necessary to do the following:

- identify the psychological and didactic foundations of the formation of physics concepts at different stages of teaching and develop methodological recommendations related to them, taking into account the activities of professors and students in this process;

- develop the experimental foundations of physics teaching: fundamental demonstration experiments, frontal laboratory work, experiments and observations, practicums, conducting research classes for those interested in physics, and widely use modern media technologies in teaching;

-use effective methods of assessing and systematizing students' knowledge and generalizing knowledge, skills and abilities;

-it is necessary to solve such urgent methodological problems as the formation of students' skills and abilities for independent learning.

Cognitive activity is understood as the level of readiness of a student to acquire knowledge, understand a problem situation, think logically and approach it creatively. This activity includes the following skills: the ability to concentrate attention on one point; the development of thinking and observation; the use of mental operations such as analysis, synthesis, comparison, generalization; substantiation and

expression of one's own opinion; independent assimilation of new knowledge.

The internal factors that positively affect the development of students' cognitive activity using media technologies in teaching physics are:

- desire for knowledge (cognitive motivation) - When a student feels an interest in a deeper understanding of a physical phenomenon, he independently asks questions, looks for problems and tries to solve them. This leads to an active, rather than passive, perception of the material presented by the teacher through the media.

- broad thinking and critical thinking. High intellectual potential forms in the student the ability to think critically and find solutions to problem situations. An example of this is comparing the theory in physics with real-life phenomena, asking questions and drawing consistent conclusions.

- the ability to use media tools purposefully. Intellectually strong students are more responsible in using digital resources. They can select, analyze, compare and draw conclusions from information. Media tools do not provide knowledge by themselves. They are only truly effective when they are met with a mind that is ready to learn. For example: The student draws on previously acquired knowledge to deeply analyze the content of a virtual experience; Independently re-searches a physical phenomenon that seems interesting to him; Finds answers to questions with a creative approach, not a simple one; Self-evaluates and seeks improvement.

-internal intellectual potential. If the student's own internal intellectual potential is not high in teaching physics, media technologies may not give sufficient results. After all, the main driving force in the formation of cognitive activity is the student's desire to know, his internal need to learn and his readiness for creative thinking. Students with good intellectual potential try to solve problems in their own unique ways, not in standard ways. The open and interactive nature of media technologies makes it possible to reveal the creative thinking of such students.

DISCUSSION

Media technologies allow you to use several methods of presenting information at the same time, such as text, graphics, animation, video and sound. When determining the didactic possibilities of developing students' cognitive activity in physics lessons using media technologies, it is necessary to first take into account the following didactic, psychological, economic, physiological requirements for media technologies:

Didactic requirements. Based on the specifics of physics, media technologies must meet the following didactic requirements: scientificity, understandable, consistent and systematic presentation (ensuring the possibility of constructing the content of educational activities, taking into account the basic principles of pedagogy, psychology, informatics, ergonomics, and the fundamental foundations of modern science), continuity and integrity (they are a logical consequence and complement of previously learned knowledge), consistency, problematicity, demonstration, activation (the presence of independence and active nature of teaching), solidity of mastering learning outcomes, interactivity of communication, unity of teaching, upbringing, development and practice.

Psychological requirements include: perception (verbal-logical, sensory-perceptive), thinking (conceptual-theoretical, demonstrative-practical), attention (perseverance, transference), motivation (active forms of work, high level of demonstrativeness, constant stimulation of high levels of motivation of students through timely feedback), memory, imagination, taking into account age and individual psychological characteristics (taking into account the acquired knowledge, skills and qualifications, ensuring that the content of the subject and the level of complexity of the educational questions correspond to the age capabilities and individual characteristics of students, and protection from excessive emotional, nervous, and mental loads when mastering the educational material).

Technical requirements: accessibility on modern universal personal computers, laptops, tablets, smartphones, telecommunications, management tools (individual and collective work of the educational process, external feedback).

Aesthetic requirements: orderliness and expressiveness (elements, location, size, color), functional function of decoration and compliance with ergonomic requirements.

Special requirements: interactivity, goal-orientedness, independence and flexibility, audioization, presentation, access control, intellectual development, differentiation (stratification), creativity, openness, feedback, functionality, reliability.

Methodological requirements: taking into account the specific features of physics, taking into account the specificity of a particular discipline, interdependence, interrelation, diversity, implementation of modern methods of information. Methodological requirements provide for the consideration of the specific features of physics, its laws, research methods, and the possibility of introducing modern methods of information processing, which are intended for teaching on the basis

of media technologies.

Media technologies created in physics must meet the following methodological requirements:

-media technologies - the construction of educational material based on the interdependence of conceptual, figurative and dynamic components;

-media technologies provide educational material in the form of a high-order structure. Taking into account the logical interdependence of disciplines;

-creating opportunities for the student to gradually master the educational material in media technologies based on various types of controls.

Media technologies intended for use in the process of physics lessons based on media technologies must have the following characteristics:

-correspondence of the main topics to the elements of the structure of the physics subject with hypertext, demonstration, audio and video explanations;

-in addition to text and demonstration, teachers should provide video or audio explanations of educational materials for the main sections of the textbook;

-have a system for quickly explaining pictures, models and schemes, using hypergraphics;

-use of a multi-window interface;

- the presence of a hypertext system designed to refer to the necessary sources in parts of the text;

- provide additional video information and animated clips for chapters of a subject that are difficult to explain with text;

- audio information should be accompanied by music;

- provide tasks and exercises that students must complete in class and outside the classroom, as well as their answers;

- differ from traditional textbooks in the presence of an explanatory dictionary of key concepts and modules. It is advisable to ask questions to reinforce the educational material after each section of the electronic textbook.

CONCLUSION

Effective use of media technologies in physics lessons increases students' interest in knowledge, enhances their cognitive activity, and contributes to the acquisition of solid knowledge. This process requires high methodological training for the teacher, but as a result, students' skills in working with science significantly develop.

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