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Modeling of Educational and Professional Activities of Students in the Process of Teaching Physics in Vocational Schools

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Abstract:

The modeling process (replacing a real object, event with a model) consists of stages, one of which works with models. Working with models in teaching allows you to master knowledge, form skills, qualifications and professional competencies. Modeling can be physical, mathematical, logical, symbolic, etc.

Keywords: Information Communication Technologies, modeling, educational and professional activities, educational experiment, experiment.

Introduction: With the advent of Information Communication Technologies, an additional opportunity arose to bring the educational and professional activities of students closer to professional activities. However, unlike the traditional learning process, in the learning process using information communication technologies, students are no longer real, but virtual objects with characteristics different from their real original. This leads to a change in the rules of interaction with objects, which, on the one hand, can limit the possibilities of working with objects and, on the other hand, expand. The proximity of education and professional activities to professional activities is provided by Information Communication Technologies, for example, students will have ample opportunities to search for the necessary information on computer networks in solving educational and professional problems. It should be noted that at present, in professional education, there is an over-relevance of information communication technologies, while the importance and role of empirical methods of cognition are declining.

Materials: Educational and professional activity is the leader in adolescence (V.V.Davidov). P.A. Sergomanova, A.V.In luchenkov's interpretation, educational and professional activities reflect the process of "entering the world of specialists" in specific, transitional forms of learning [1].

Empirical methods of knowledge should stand at the beginning of the methodology of information search. Under the condition of having these methods, the student will have the ability to "see" the developed intuition, the problem, to "put forward" the hypothesis to solve it. Thus, mastering empirical (including experimental) methods of information search is one of the conditions for the formation of a creative personality. Information search skills, as a component of information competence, can be formed in the types of educational and professional experimental activities using information communication technologies, which initially have similar content, goals in the course of study-cognition, then in the physics course of the secondary and vocational school. At the initial stage of training, the content of the activity is established as a subject (objective world), and then, according to its image, as a subjective product of the activity containing the content of the subject [2].

Methods: The ability to independently organize experiments and perform laboratory work is based on knowledge of the structure of the experiment. The structure of the educational experiment is determined in accordance with the structure of the scientific experiment. The beginning of an educational experiment, like a scientific experiment, is expressed before the formation of the purpose of the experiment, and then the scientific hypothesis, with the help of which it is predicted what will happen with certain actions. Thus, in the process of an educational experiment, including on a computer, students learn to formulate hypotheses - scientific assumptions or assumptions whose true value is not determined. In the process of performing laboratory work, students have the opportunity to consider the hypothesis as a method for the development of scientific knowledge, including the promotion of their own assumptions, and then as a method of experimental verification, and as a component of the scientific theory under study [3]. Based on the hypothesis, students draw up the tasks of the experiment, determine its content and course. After determining the content of the experiment, they studied the methodology for its conduct. For example, before the experimental study of the relationship between the pressure and volume of a given mass of a gas, there was a hypothesis that the pressure of a gas should increase with a decrease in volume (this follows from the molecular-kinetic theory of a gas). Educational-Scientific task arising from the established hypothesis: to check the correctness of the assumption made on the basis of theory. The task of the experiment determined its content: the gas pressure is measured by the change in the volume in which it is located. Restrictions were imposed on conducting experiments: it is necessary to exclude the effects of temperature and gas Mass in it. These restrictions determine the conditions for conducting an experiment.

Results: The next solution to the problem was the development of a methodology for conducting an experiment that met the previously established requirements. All this constitutes the design of an experiment or the development of an experiment model and was the first stage of its implementation. No scientific experiments are carried out without the implementation of this stage. Therefore, it must also be carried out in a learning experiment. The task of the second stage was to determine and create a material and technical base for the implementation of the experiment (selection of tools, materials, buildings, etc.). Scientists determine the requirements for equipment, select it, design it, place an order. Students, as a rule, experiment with equipment that is available and has already been prepared for them by a laboratory assistant or teacher. That is, they do not have the opportunity to independently solve the issue of choosing laboratory equipment. At the final stage of the experiment, students carried out a mathematical processing of the measurement results and a theoretical analysis of the data obtained and drew conclusions about the correctness of the hypothesis, which was initially put forward. The conclusions obtained provide new information for students about the physical phenomenon or the possibility of its application in technical devices. In the structure of the scientific experiment, the following sequence of actions performed in the educational experiment is considered [4]: Stage 1 1. Formation and justification of the purpose of the experiment. 2. Formulation and justification of the experimental hypothesis. 3. Determination of the necessary conditions for achieving the goal of experience. 4. Experimental design: * scale; *

tracking; * experiment. 5. The choice of the method of encoding the information received in the process of performing the experiment. Stage 2 6. Determination of the necessary tools and materials. 7. Choosing the necessary tools and materials or checking their presence on the desktop. Stage 3 8. Installation of stands. 9. Conducting experiments, measurements and observations in a planned sequence along with encoding the data obtained. Stage 4 10. Mathematical processing of the results of measurements and observations. 11. Analysis of the received data. 12. Formation and recording of conclusions. The actions listed above can be carried out to one degree or another with the help of Information Communication Technologies, which have more opportunities to inform students and use visualization in training. In addition, modern information technology can also be used as a tool that allows you to create virtuals.

Discussion: In organizing the educational activities of students through computer simulation, it is necessary to be aware of the possibilities of effective use of information communication technologies within the framework of the educational process. To this end, it can be seen how computer modeling is associated with the educational-cognitive and educational and professional activities of students [5].

Conclusion: In organizing the educational activities of students through computer simulation, it is necessary to be aware of the possibilities of effective use of information communication technologies within the framework of the educational process. To this end, it can be seen how computer modeling is associated with the educational-cognitive and educational and professional activities of students.

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