

TECHNOLOGIES FOR THE DEVELOPMENT OF EDUCATIONAL AND CREATIVE ACTIVITIES OF STUDENTS IN THE PROCESS OF SOLVING PROBLEMS IN MOLECULAR PHYSICS

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ABSTRACT

This article highlights some aspects of the technologies for the development of educational and creative activities of students in the process of solving problems in molecular physics.

Keywords: Means, activity, result, technology, form, drawings, diagram, diagram, histogram, phenomenon, process, analysis, synthesis.

INTRODUCTION, LITERATURE REVIEW AND DISCUSSION

The literature describes three methods for solving problems and achieving results: 1) awareness, in the process of which the student deals with the physiological technologies of educational and creative activities and the means corresponding to them; 2) making a decision where the student works with the psychological technologies of educational and creative activities and the means corresponding to them; 3) a decision when a student uses the logical technologies of educational and creative activity and the means corresponding to them.

There are two types of learning relationships and tasks: a) student and task; b) a student and a real look. The first type of relationship occurs between the student and the signs (or signs, for example, with forms, drawings, diagrams, drawings, tables, graphs, charts, histograms., Since any task materializes in the form of formulas or dynamic drawings, tables, diagrams, drawings, diagrams, histograms, etc. The second type of relationship occurs between the student and the real reality. The real reality reflected in the problem is studied in the sections of physics.

From the point of view of relationships, the student's educational and creative activity is considered as a process consisting of two stages:

1. The process of contact with conventional signs, in which two types of changes are noted: a) the transition of signs into a conscious state under the influence of a student; b) consideration of changes - signs that occur in a student under the influence of conventional signs, the content indicated by them.

2. The process of transferring content specified by conventional characters to the appropriate area. And here two types of changes are noted: a) translation of the conventional symbols into the corresponding content under the influence of the student, consideration of which section of physics the problem belongs to; b) changes in the student's mind under the influence of conventional signs - understanding, consideration, analysis and synthesis.

Preparing a student for educational and creative activities to solve problems in molecular physics is a long process, carried out in several stages:

The first is the stage of the student's psychological preparation for solving problems in molecular physics. For this, the student must know the following principles:

✓ the principle of proportionality - the proportionality of the student's need to master knowledge, skills, abilities and the student's need to change their educational and creative activities;

✓ principle of educational and creative activity - co-creation of an object and a subject in the pedagogical process;

✓ the principle of the ability to find a way out of a situation - the ability to find a solution to new situations not yet observed.

The second is the stage of formation of theoretical knowledge, practical skills of a student in the field of psychology, pedagogy, didactics, in particular the theory and practice of teaching physics, where the student must master:

✓ technologies of educational and creative activities;

✓ skills transfer theoretical knowledge, practical skills and abilities in new situations;

✓ skills to distinguish, classify tasks by types (types);

✓ skills of foresight of new functions of an object;

✓ skills of searching and finding alternative sources and directions for solving problems in molecular physics;

✓ skills of creative self-affirmation, manifestations of educational and creative activities.

The basis for ensuring the effectiveness of preparing a student to solve problems in molecular physics is a clear definition of the purpose of the process.

When solving problems in molecular physics, it is necessary to create such problematic situations when, in solving them, theoretical knowledge, practical skills respected by a student occupied an indefinite place. For example, before studying the topic "Internal Resistance of Sources", the teacher may ask the student the question "Why, instead of the car's battery, it's impossible to use several batteries connected in series. After all, they have the same voltage of 12 V?"

To find the answer to this question, the student must master a new concept, i.e. the concept of internal resistance, i.e. In this case, the concept of "internal resistance of the source" is manifested as indefinite (clear) theoretical knowledge.

One of the main features of the uncertain in a problem situation is the degree of clarity of his task. Also, the difficulty level of the problem situation determines the degree of accuracy of the indefinite.

Another feature of a problem situation is need. As psychologists note, the basis of a problem situation is a contradiction that is significant for the student.

Of great scientific importance for studying the structure of educational and creative activities of students were the studies of the Russian psychologist V.A. Krutetskiy, who distinguishes the following physical abilities of a student:

1. The ability to accept information on solving problems in molecular physics.

2. The ability to understand materials for solving problems in molecular physics.

3. The ability of data processing to solve problems in molecular physics: a) thinking within the framework of symbolic logical and physical symbolism; b) operational generalization of physical objects, relationships and actions; c) reduction of the process of physical reflection and the system of relevant actions.

4. The general synthetic component: a) the physical mindset (orientation); b) natural-scientific mentality; c) the focus of the mind on the exact sciences.

The following types of student's educational and creative activities for solving problems in molecular physics are distinguished:

1. The structure of inductive and logical analysis:

a) intuitively - heuristic; b) normative, logical and creative activity.

2. According to the specifics of the content of the task:

a) inventive activity; b) research activities; e) artistic activity, applied art (folk craft).

3. By the ratio of theoretical and practical educational and creative activities of the student:

a) energy; b) theoretical.

4. By the level of student creativity in solving problems:

a) independent creativity; b) compulsory (forced) creativity.

5. By the logic and proportionality of the student's educational and creative activities:

a) inductive creativity; b) deductive creativity.

6. By the ratio of objectivity and subjectivity of the novelty of the sphere (level of activity) and the result:

a) educational and creative activities; b) scientific activity (or just creativity).

7. In the subject area:

a) individual; b) affiliate; c) group; d) collective.

In the student's educational and creative activities for solving problems in molecular physics, there may be contradictions necessary for acting on a certain pattern of student's educational and creative activities, which should not be eliminated. In the process of educational and creative activities of the student, they are activated using non-traditional methods.

Consider the levels of assimilation of problem solving - one of the important characteristics of the frequency of educational and creative activities in solving problems in molecular physics, solving problems in molecular physics, based on the growth of scientific management.

First level. For the first time in the student's mind, a solution to problems in molecular physics is being formed. During the process, the student gets used to the acquired knowledge in the field of solving problems in molecular physics.

Second level. Penetration into the image formed in the student's mind when solving problems in molecular physics. Theoretical knowledge, practical skills of a student who has reached a given level of learning, are automated and converted into skills.

Third level. Transformation in solving problems in molecular physics of theoretical knowledge into concepts. A student who has reached this level is able to express his attitude to the theoretical knowledge being studied, is more fully aware of the application of theoretical knowledge in practice. In the process of solving problems in molecular physics, he begins to think independently through theoretical knowledge. Ultimately, the student's theoretical knowledge turns directly into a source of thought.

In order to enhance the student's educational and creative activities to solve problems in molecular physics, modern educational technologies and interactive material are used, which helps:

✓ increase the student's interest in the discipline being studied, helps to eliminate indifference, encourages him to independent thinking, creative search;

- ✓ ensures the formation of an active interest in the formation of theoretical knowledge, practical skills and competencies;
- ✓ develops student interest in solving problems;
- ✓ activates the cooperation of student and teacher, student team.

Modern educational technologies ensure guaranteed achievement of educational goals in close cooperation between the student and the teacher.

Solving problems in molecular physics is of great importance as an effective means of activating and developing the student's educational and creative activities.

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