

### Physics and Mathematics Issues and its Role in the Educational Process

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#### ABSTRACT

*in teaching physics, the solution of the issue becomes important, increases the curiosity of students, encourages independent reflection and has a positive effect in shaping their worldview. They also learn to realistically feel the reality that happens in nature.*

In teaching physics, it is important to solve the issue. Problem solving-physics is an integral part of the teaching process, which greatly contributes to the formation of physical concepts, develops physical thoughts, acquires the skills of practical application of knowledge. Solving physics problems is widely used in the following cases:

- a) in the issuance of new information;
- b) to form a problem situation and to put a problem on the students;
- c) in the formation of practical skills and abilities;
- d) in testing the strength and depth of students ' knowledge;
- e) in the reinforcement, generalization and repetition of the material;
- f) in introducing technical achievements and providing polytechnic education;
- g) in the development of creative abilities of students.

Through the solution of the issue, students are brought up with diligence, meticulousness, independent reasoning, interest in reading and their perseverance in achieving the set goal. It also has a positive effect on the formation of the worldview of students, introduces them to the achievements of Science and technology.

Readers use problem solving to reinforce a new topic, replicate what has been done, and test

their knowledge. The solution to the issue is to apply the theoretical knowledge gained to practice. This is of great importance in the development of physical thinking ( thinking ) of students, including in the analysis of phenomena, in the generalization of information about them, in determining their similarities and differences.

Physics issues: are divided into several types according to their content, condition and method of solution.

According to the content - the issues are divided into mechanical, Molecular Physics, Electrical, optics, atomic and nuclear physics with issues. There are also concrete and abstractly meaningful issues. The content of abstract issues has in common and is aimed at revealing the essence of phenomena. Concrete meaningful issues, on the other hand, have great exhibitionism for being linked to practices and students ' life experiences.

Simple problem solving refers to those issues in which one or two formulas are used at the time of its solution, one or two conclusions are drawn, the formulas are intended to interpret the content, to carry out a simple experiment.

Complex issues are those in which, at the time of its solution, several physical laws are applied, knowledge of various sections of physics is used, several conclusions are drawn, which require sufficient skills in performing the experiment.

When solving any problems of these types, it is solved by applying several mathematical practices. Depending on the application of mathematical practice, methods for solving problems are divided into arithmetic, algebraic and geometric methods.

The section of textual issues of mathematics cannot be imagined without physical phenomena, physical problems, it is impossible to imagine solving physical problems without the use of mathematical formulas and mathematical operations in solving physics problems. When studying the section of mechanics, the laws of trigonometric function, quadratic equation, Pythagorean theorem, cosine theorem trigonometry are widely used. Also, in the process of studying the laws of gas, a wide range of benefits are made from graphs when analyzing the state of the gas and its changes. As we know, in the course of mathematics, graphs are studied very perfectly. And these graphs are also widely used in physics courses. The graph shows the course of the physical process, visually reveals the dynamics of the phenomenon.

Mathematical concepts should be used in their place and correctly. During the study of the physics course, some physics literature also includes subjects related to mathematics such as “actions on vectors”, “some mathematical concepts”, and these subjects are of great help in Physics in the correct interpretation of mathematical topics as well as concepts. Because we know that in the physics course there are concepts such as vector magnitudes and scalar magnitudes, when adding vector magnitudes we use concepts such as vector sum, and when adding scalar magnitudes we use concepts such as algebraic sum in the mathematics course. In the mathematics course, however, there is a difference between these two cases. Only when students can understand and understand the difference between the two when using mathematical operations can they correctly interpret the issues they have worked from physics. Otherwise, the issue will cause errors in performance. For this reason, the mathematics course is also of great importance in the study of physics.

Assessment of students ' knowledge in the lesson on solving problems in physics, incentive criteria should be known to every teacher. During the entire lesson, active students correctly and quickly work out all the issues given. Slow-absorbing students, on the other hand, are able to handle a matter or two correctly-he wants to get an exemplary assessment for this properly worked issue.

At this time, the teacher finds it difficult to assess the knowledge of students. Because although

fewer issues work, these students will also have the issue worked properly. By applying the following pedagogical method, this problem can be eliminated and students' interest in the lesson can be further increased:

The teacher announces the topic of the problem solving lesson. On the topic provides detailed information about the required physical quantities and their expressions.

After that, the solution of issues begins. The condition of Issue 1 is announced. In the notebook of students who worked correctly and quickly on the issue, the teacher puts not an assessment, but a sign with the letter "N". Then they begin to work Issue 2. For this issue, a sign is made with the letter "A". The letter "M" for Issue 3, etc. In this way, further issues are worked out.

If one student correctly and all the issues given during the lesson if it works quickly (8 issues in this lesson) instead of a consecutive score, the word "exemplary the forming letter characters are laid out." Exemplary "at the end of the lesson to readers who have collected all the letters of their word (at least 7

An incentive card is issued, which says "an exemplary student in physics", and "5" is assessed by an assessment. Students who were able to collect the letters "sample" during the lesson are given a card "a good participant in a physics lesson" and assessed with an assessment "4".

Students who were able to work up to 5 issues during the lesson were told: "Physics is an interesting science. Work on yourself." The card is issued, and these students are assessed with a grade of "3".

By applying this method, the following results can be achieved:

1. Readers are interested in collecting their mysterious letters, strive to solve the issue faster and are interested in the result of their work.
2. Even readers who have received an "3" assessment cannot be dissatisfied with this assessment, but, on the contrary, understand why they received a low assessment and begin to work on themselves.

The correct Organization of theoretical and practical (solving problems, laboratory) lessons in conducting classes and fair students' knowledge assessment requires great pedagogical skills from a teacher of physical science.

In particular, in the problem solving lesson, some timid students, although they have worked out the issue correctly, do not turn to the teacher without believing in themselves. Or there are also such negative situations when students who actively participate in the lesson develop the issue, when the teacher confirms that the matter is correct, some "copywriter" students copy the issue and show it to the teacher. In such situations, these negative situations are eliminated if the teacher organizes the lesson not in the traditional way, but on the basis of new pedagogical technologies.

For educational purposes, abstract situations are often used, and an issue is formed that is called important issues. First of all, each issue contains given and unknown numbers. The number in the matter moves the number of sets or the value of quantities, represents the relationship or will be the given abstract numbers.

For example: when solving parable 1, it means to reveal the connection between the numbers given in the condition of the issue and the number being sought, and on this basis to select arithmetic operations, and then perform them, as well as answer the question of the issue.

The solution of issues itself is a certain methodology, which has a much more positive effect on the mental development of students, since it is required to analyze and synthesize mental operations, abstract, compare, summarize. For example: the reader analyzes when solving any issue, separates the question from the condition of the issue, synthesizes it when drawing up a

solution plan, uses concretization (imaginary drawing of the condition of the issue), and then abstractions.

In conclusion, during the study of the physics course, students should consider that mathematical formulas reflect real bonds and that they come from these bonds.

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