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THEORETICAL ANALYSIS OF THE PEDAGOGICAL CONDITIONS FOR THE FORMATION OF RESEARCH SKILLS IN STUDENTS BY WORKING ON PROBLEMS RELATED TO THE ASSESSMENT OF PHYSICS

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Introduction

It is known that the concept of education is changing in the secondary education system of our republic based on international experiences. In other words, according to the previous concept, imparting knowledge to students is the main thing, but now, together with imparting knowledge, learning to acquire knowledge and collect information, forming skills of data processing and their practical application form the concept of modern education.

In order to assess the effectiveness and quality of this educational concept, the PISA system was developed and international studies are being conducted on this system. In this system, the level of development of students' research skills in natural sciences is evaluated. Taking this into account, various scientific pedagogical researches are being conducted in our republic and abroad to develop students' research skills in practical physics classes. For example, in [1-3], the method of developing educational research skills was improved by working on experimental and graphic problems [4], the problems of developing educational research skills were solved using physical experiments and various laboratories. But in these methods, it is possible to one-sidedly develop educational research skills in students only within one subject or subject, because the problems and laboratory works that should be worked on or performed in these points are given ready. In order to fully respond to the concept of modern education, the student should be able to create and work on a physical problem based on separating a physical process from an event, rather than working on a ready-made problem. On the basis of this concept, generalized educational research skills are formed and developed in students. Implementation of this concept requires the creation of special conditions for school education.

In order for some event or process to occur in nature or in social life, it is necessary to create or create some condition. In the same way, the necessary work should be planned to create conditions for improving the methods or methods of developing generalized research skills in students.

From a philosophical point of view, the concept of "conditions"[5] explains the relationship of the object to the events surrounding it and the fact that the object does not exist without these events. This concept is defined in as follows; that is, the condition is a component of the environment, the state in which it occurs, exists and develops.

Pedagogical conditions consist of a set of measures used in the pedagogical process and are aimed at increasing the effectiveness of the pedagogical process. Circumstances are largely a factor outside the subject. Therefore, if we take the formation of generalized research skills by solving physics assessment problems in students as a subject of research, then we believe that the following conditions must be created for the formation of the above-mentioned skills in students.

1. Additions to the requirements for the level of physics learning of students in advanced groups of state educational standards.

In these requirements, the content of education and its dependence on practice should be strengthened, because in modern times, rapid changes in socio-economic conditions create the need not only to acquire knowledge, but also to independently learn new knowledge based on the acquired knowledge, search for information, process it and educate people who make the necessary conclusions.

2. Organization of educational activities in accordance with the requirements of the time and ensuring their organizational and methodological support.

Academic lyceums and specialized schools have enough hours devoted to physics, so in addition to the main type of their activity, students should pay great attention to research skills. For this purpose, it is necessary to provide the educational institution with highly qualified personnel, because the quality of education depends mainly on the knowledge of the teacher and the skill of organizing teaching, with all the scientific-methodical, material-technical support.

3. Formation of students' motivation to solve problems related to assessment.

Today, in the teaching of physics, as well as in all subjects, the activation of the student's personality is one of the foundations of the educational concept. For this, the student should be able to understand the problems in the processes occurring in nature, social life, and technology in addition to developing standard problems, and be able to solve problems based on these problems. Such a demand for education is related to the very rapid development of science and technology since the present time, because with the passage of time the demand for some professions is disappearing and new professions are emerging rapidly. Fast mastery of these professions depends on how advanced the specialist or person is. In order to educate a person who meets the requirements of the mature age in all aspects, it is achieved by using various methods and forms of education.

We cite the following as sufficient conditions.

1. The final attestation materials for a set of questions related to different types of evaluation for graduates of academic lyceum and advanced physics groups include questions related to the evaluation that determine the level of formation of research skills and the existence of methodological instructions for solving problems together with the criteria for evaluating the solution of such problems

2. According to the analysis of the results of the continuous monitoring of students' mastery, various consultations and additional trainings are organized.

After creating the basic conditions for the student-teacher, the main focus is on identifying the main factors that influence the students' firstly the formation of assessment problem-solving skills, and then gradually the development of research skills. These factors may vary depending on the student's previous knowledge and the teacher's skills. Given that each problem is a small research project, most students will already have developed some research skills during the problem solving process. Therefore, in order to form generalized research skills in students with the help of evaluation problems, it is necessary to first form and then develop the problem-solving skills to the required level, because sufficient hours of lessons in physics-in-depth groups provide an opportunity for this. One of the main problems in this process is that teachers often confuse teaching problem solving with teaching problem solving. In the first case, i.e. in the method of problem solving, it is teaching how to solve a problem related to a certain topic in a certain way. Depending on the given problem, different methods are used for solving the problem, such as kinematic links, coordinate rotation, the law of conservation of energy or the mirror method.

The second optional study is teaching to work on physical problems, which in turn includes the first, but differs in direction and purpose. Based on the method of teaching the problems, students' oriented

activities lie. These activities are divided into several types as noted in [6-8]. This method mainly relies on three or four types of activities, in which the teacher shows the students several problems related to a certain topic, and then offers to work several problems related to this topic in a selected way. According to the opinions expressed about this method, a lot of time is lost, but depending on the competence of the students, the intended goal is sometimes not achieved, that is, the students do not have full problem solving skills. According to the analysis of observations, students make gross mistakes in many points while working on similar problems. As noted in [9], none of the remaining activity-oriented methods can be considered to develop a well-rounded learner, that is, each method is useful, but none of the methods fully develops generalized problem-solving skills or generalized research, but they complement each other. Therefore, the teacher can use an activity-oriented method based on the content of the educational material and the pedagogical problem to be solved. Therefore, teaching students a new method of problem solving does not literally improve their problem solving skills. Therefore, in order to form a general conscious approach to problem solving, students should have clear ideas about the content, structure, and uniqueness of a physical problem, as well as the mechanism and process of its operation.

According to the analysis of the literature and scientific works on the methodology of problem solving, the following should be taken into account in order for students to decide on such a feature as a conscious approach to working with optional standard and non-standard educational physics problems.

1. A physical problem is a complex type of activity that includes several mathematical and logical operations. The student must have strong skills and abilities to perform these actions.
2. Must have independent theoretical knowledge and scientific imagination to logically connect mathematical expressions consisting of mathematical operations.
3. In order to form students' imagination based on scientific theory, it is necessary to apply to the educational process the correct and inverse physics problems for students based on the physics task, the correctness of the answers to the created problems with scientific evidence.

Most of the evaluation issues presented in the studied literature, problem sets, and scientific articles are given as a physical task, and if we take into account that to complete this task, we need to create one or several related problems and then work on them, we can see that almost all of the above-mentioned three points have been fulfilled.

Based on the instructions in these points, the questions or questions related to the assessment of the formation and development of generalized skills can be divided into the following sections.

Section 1. Learning the content of educational physics problems. The instruction in this section is first implemented from the lower classes, that is, the subject, condition and requirement of any issue. The problem is a problematic situation, as we mentioned above, as a result of the subject becoming a participant in some conditions, something remains unknown, and finding the unknown is considered to be working on the problem.

Section 2. Learning to apply the acquired theoretical knowledge, laws, rules and formulas in the process of problem solving.

For this, it is considered necessary to introduce which law, rule, concept, theorem or formula was used in the process of working on a physical problem, because the relationships between the expressions involved in various mathematical operations are based both scientifically and logically. An example of such a series of problems are problems that are solved using three or more expressions. These types of

problems form the basis of the problems used in academic lyceums and groups where physics is taught in depth. Among such problems, the use of standard and non-standard problems with a high level of difficulty, taking into account the competence of students, creates a basis for the formation of generalized skills in students.

Section 3. This section consists of learning to formulate a physical problem based on a given physical assignment or physical quantities that have some connection with each other, work and justify the correctness of the solution. skills and characteristics such as the ability to receive information are formed in students. If it is recommended to use the problems related to this section in the 8th grade of the schools where physics is taught in depth, it should be used from the 1st year of the academic lyceums. The use of such problems is a necessary condition for the formation of students' problem-solving skills, because through this, students learn to pose a problem situation, that is, a problem that has a solution.

In the 4th section, students are taught to work on physical problems aimed at forming general skills that include a general approach, that is, a general type of activity. Such type of issues, interdisciplinary and educational research issues should be included. By working on such problems, general problem solving skills are not only formed, but also developed to some extent. At the same time, students will develop general research skills.

The use of the issues presented in these sections in the educational process is not limited by specific time standards or indicated when to use them, because they can complement each other if they cross each other in the educational process. In addition, we believe that it is necessary to follow the following when creating a set of physical problems or tasks, because it will be easier for students to imagine and the problem will be more clear.

-scientific, because scientific-theoretical elements should be distinguished when solving the problem.

-consistency, because each completed task should be the basis for a new task to be completed and the principle of simple to complex should be followed.

- systematicity, because there should be a set that covers the issues that students regularly deal with and work with

- flexibility, an approach taking into account the abilities and opportunities of students is necessary, otherwise the expected result cannot be achieved.

Therefore, according to the analysis of the analyzed pedagogical psychological, scientific and educational-methodical literature, it is necessary to develop a comprehensive system to improve the formation and subsequent development of generalized research skills in students. The didactic system, which mainly includes the principle of consistency in the development of activities, should gain priority. In order to form and then develop the generalized educational research skills of students in the educational process of in-depth physics courses, it is appropriate to create the following pedagogical conditions, i.e. to improve the content of educational and regulatory documents, to correctly distribute the hours of class allocated to practical training, to create a methodological guide, lesson plans, and a set of problems; pay great attention to the development of intellectual abilities, creative, creative thinking characteristics of students from lower grades; to constantly control the educational and practical skills of students during the educational process and to constantly adapt the work to be done.

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