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DEVELOPMENT OF EXPERIMENTAL ABILITIES OF FUTURE PHYSICS TEACHERS

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Abstract. *The article considers the formation of experimental competence of a physics teacher by modernizing the structure of laboratory work to improve the quality of teaching. It deals with the formation of the competence of a physics teacher by modernizing the structure of conducting laboratory work to improve the quality of teaching.*

Keywords: *occupation, modernization, application, teacher of physics, formation, education, quality indicator, competence, future teachers, degree, experimental research.*

The proposed model pays special attention to the purpose of laboratory classes in physics - the acquisition by students of the necessary skills and rationalization skills in teaching a physical experiment. At the same time, students should check the basic physical laws of phenomena, study the measurement methodology and the rules of mathematical processing of measurement results, learn how to handle modern scientific equipment, can independently perform related work. [1, page 21].

It should be noted that laboratory work is divided by specifics:

1) Laboratory work of an industrial nature;
2) Laboratory work of a pedagogical nature;
3) Laboratory work of a scientific nature;
4) Laboratory work of a universal nature

When performing laboratory work, the teacher draws up a schedule of laboratory work, divides them into subgroups of no more than 5 students (a link or a team) available in the classroom.

In this paper, laboratory work of a pedagogical nature is considered, taking into account the long-term pedagogical experience of its implementation and application at this stage.

Each laboratory lesson is preceded by a preliminary preparation of the student, which includes:

a) Familiarization with the content of the description of the laboratory work to identify the purpose of the work and how the application of this work is carried out in practice, whether he will be able to independently perform related laboratory work, independently assemble the schemes of the experimental installation of related work and also create their virtual states in a computer.

b) elaboration of the theoretical part of the study of the purpose and objectives of this work according to the textbooks recommended in the methodological instructions to it;

c) drawing up a form of a report on laboratory work in accordance with the following standard ВУЗаСТП21600.33-10-84"preparation of reports on laboratory work " if an enterprise or organization is interested, they can make piles of the form or standards at the request of the organization or enterprise.

d) in the report, the student must make at least 10 tests on each of the four answers on this topic to improve the testing development methodology

Students "report" is performed on framed sheets of standard size 297*210mm (A4 format). Entries on the back of the sheet are not allowed.

The "report" should contain:

1) the names of the laboratory work;
2) the purpose of laboratory work and its application in production or pedagogy;
3) setting the task;
4) appliances and accessories;
5) a table for filling in the statistical characteristics of measuring instruments;
6) theoretical part (basic concepts and laws);
7) descriptions of the measurement method and installation;
8) tables for recording measurement results in them.

The theoretical part of the laboratory work should be brief, take up no more than one sheet. It should contain the main provisions, the laws underlying the studied physical phenomenon, and a working formula (without conclusion) with the decoding of all letter designations. When preparing for laboratory work, the student should remember that the methodological guidelines for laboratory work are only the main one for their implementation. In addition, it is necessary to carry out theoretical preparation for each laboratory work with the educational literature specified in the description of the laboratory work.

To obtain admission, the student must demonstrate his mastery of the method of determining the desired physical quantities, an understanding of the physical phenomena studied in the work, an understanding of the physical meaning of the basic quantities [2, page 18].

Students who have received admission begin to perform laboratory work. Safety regulations must be strictly observed in the laboratory. During the lesson, it is forbidden to engage in extraneous matters, approach other installations and interfere with the performance of work by other students. Students work in teams. Each student's report should be individual. Work not done without a valid reason is carried out with the permission of the teacher at a specially designated time.

The practical part of the work is to familiarize students with the proposed tools, instruments and equipment. At the same time, special attention is paid to determining the metrological characteristics of measuring devices, which include: measurement range, price of divisions, accuracy class, measurement error. These characteristics, expressed in the units in which readings are taken from the instruments, are entered in the table.

At the second stage of work – commissioning of the experimental installation, assembly of electrical circuits, installation of the installation and so on. Preparation of the installation performed by the student must be checked by a teacher or a laboratory assistant. After the control check, the student begins to perform the work independently. At the first observations, no counts and records should be made. After the student has traced the phenomenon several times, he will learn how to control the installation, and then you can start recording the readings of the instruments.

The results of the experiment are recorded in the table presented in the descriptions of laboratory work. At the same time, the designations and units of measurement of each physical quantity are recorded in the table.

The results obtained are presented to the teacher. Then, with the permission of the teacher, you need to turn off the installation. At the end of the practical part of the work, the student completes the preparation of a report on laboratory work. For the development of logical thinking, there are at least 10 tests on this topic-tests on each with four answers. This is an important factor in the preparation of future physics teachers. The teacher will check the correctness of the preparation of tests for the methodical preparation of the student. To fill out the report in preparation for the lesson, it is supplemented with the following content:

1) a table with measurement results;
2) mathematical processing of the results of all direct and indirect measurements;
3) calculation of the required values in SU units;
4) charts (if necessary);
5) conclusions.

In order for the report to be clear and accurate, the student must have a laboratory notebook in which the calculation of the desired physical quantities, measurement errors, etc. is carried out. All stages of these calculations should be briefly reflected in the report.

The conclusions of the report should be based on the analysis of the patterns identified in the work, the relationships between various physical quantities, and the comparison of the results obtained with theoretical and tabular ones.

At the end of the lesson, a fully completed report on laboratory work is handed over to the teacher. The transfer of the report to the house is done in exceptional cases.

The protection of laboratory work is carried out in the next lesson and includes such elements as:

a) interview on the experimental part of the work;
b) discussion of the results of the work;
c) checking prepared test questions;

In order to quickly respond to the ongoing processes and actively implement the achievements of science and technology in the classroom, a special training competence is required from a physics teacher [3, page88]. To train future physics teachers, in addition to experimental competence, it is necessary to be able to make concrete decisions in difficult situations when teaching physics.

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