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Development Of Professional Competence Through Organization Of Independent Education For Physics Students

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Abstract: This work sheds light on the importance and high education students of physics for his independent major metho body, increasing the links between education and the development of professional competence independent of I, and in increasing the body of her independent optical metho't. Independent of the organization through education, the problem is not only physical, but also the professional competence of format were studied.

Keywords: Physics, metho, professional competence, independent education process, education, size, education, knowledge, laboratory.

Introduction: In the modern higher education system, the development of students' professional competence plays an important role. Independent education, in addition to providing students with theoretical knowledge, also develops their practical skills, analytical and problem-solving abilities. Physics serves as an effective tool in the formation of professional competencies in higher education, especially through independent education. Since the nature of physics is based on mathematical, experimental and scientific methods, independent education is of great importance in developing students' deep knowledge, scientific thinking and practical skills.

According to research, the effectiveness of current students' use of independent education does not exceed 30%. In independent education, students spend most of their time preparing for exams, writing term papers and writing reports for laboratory work.

At the same time, an analysis of a number of literary sources shows that today there is practically no holistic theoretical substantiation of the potential opportunities for independent activity of higher education students. Despite all the truly existing possibilities of independent activity, its potential as a socio-pedagogical phenomenon has been poorly studied and, as a result, has not been fully realized. Thus, the need for theoretical substantiation of the problem of independent education of students as a condition for professional training is obvious. In her dissertation research, Nazarova analyzed this problem in depth. According to S.I. Gessen, independent activity is the final stage in human education. The scientist considers self-education to be creativity. V.I. Dobrenko emphasizes that it is a kind of activity of a student without the constant guidance of a teacher [3]. Currently, O.V. Akulova, V.A. Zimneya, N.F. Radinova are studying modern independent activity. Among the most important aspects of the problem of independent activity in the implementation of a competency-based approach, S.S. Otamuratov, N.S. Safoev, A. Abdukodirov, N.N. These studies make a significant contribution to the accumulation and systematization of knowledge on the problem we are studying.

Studies show that the organization of independent learning plays an important role. In leading US universities, the approximate ratio of classroom and independent work is 1:2. This means that with a weekly workload of 46-60 hours in the classroom, classes (lectures and seminars) last only 16-26 hours. On average, a student attends two pair classes a day with a five-day work week. The remaining 20-34 hours are spent on their independent work [8].

New opportunities for computerization open up new teaching methods and enhance changes. Students collect the necessary rating points by submitting their independent work via a computer. The experience of US universities shows that with the emergence of university and interuniversity education, we can see a real prospect for the effective organization of independent work in computer networks as a

connecting tool between the teacher and the student.

Independent learning will be more effective only if it is closely and consistently connected with classroom learning. Taking this into account, the selected pedagogical technology should also take into account the student's independent learning and ensure that students use independent learning purposefully. Because it has been shown in studies that a purposefully organized form of independent learning effectively affects the student's mastery rate. In teaching "Optics", the work to be done in each semester is designed, divided into content and appropriate approaches and methods are selected. It is known that before applying any pedagogical technology or any method to the lesson process, it is necessary to have information about the knowledge and interests of students, otherwise the effectiveness of the lesson will not be as expected. It is advisable to choose various teaching tools based on the information obtained about their knowledge and interests [4].

The importance of independent learning in physics

Studying physics develops the skills necessary to solve not only scientific, but also practical problems. The organization of independent learning in physics in higher education has the following advantages for improving students' professional competencies:

Combination of theoretical and practical knowledge: Along with theoretical knowledge, practice also plays a significant role in physics. Through independent learning, the student has the opportunity to apply knowledge in practice, for example, by conducting experiments and laboratory work.

Development of problem-solving skills: Solving problems in physics develops students' analytical thinking, a systematic approach, and the ability to develop creative solutions. In the process of independent learning, the student develops these skills by working on complex problems.

Research and creativity: Independent learning provides students with the opportunity to actively participate in scientific research, generate new ideas, and conduct scientific research. This helps students develop research skills and creativity.

Formation of skills necessary for professional activity: Studying physics provides students with the skills necessary for work in technical and engineering fields. Independent learning develops students' abilities to work independently, make decisions, and implement innovations in their professional activities.

Professional competence and its concept

A student's competence in physics is the ability to use and apply in practice the knowledge, skills, and competencies acquired in physics to understand discoveries, scientific innovations, and solve practical and theoretical problems encountered in everyday life[2].

Professional competence is a set of knowledge, skills, and competencies related to the profession. In higher education, professional competence is formed by students' application of theoretical knowledge to practice, problem solving, and solving real-life problems.

The main components of professional competence are:

Theoretical knowledge: In-depth knowledge of the basic laws, concepts and mathematical models of physics.

Practical skills: The ability to conduct physics experiments and laboratory work, analyze the data obtained and draw conclusions based on them.

Problem solving and decision making: The ability to solve problems in physics, create mathematical models, and make decisions based on scientific results.

Innovative thinking: The ability to create new ideas in physics, apply creativity and innovations in practice.

Methods of organizing independent learning in physics in higher education

Laboratory work and experiments: One of the main components of independent learning in physics is the performance of experiments and laboratory work. Students independently apply the theoretical knowledge they have learned through laboratory work to practice. This method makes the learning process lively and interactive for students.

Online platforms and interactive lessons: Online courses, video lessons, and interactive platforms are effective tools for supporting independent learning for students. Such resources provide students with the opportunity to study, consolidate knowledge, and obtain additional information in their own time.

Independent research and scientific research: Students develop their scientific thinking by conducting independent scientific research, collecting and analyzing data. This method encourages students to discover new knowledge and create innovative ideas.

Daily work and projects: In the process of independent learning, students are presented with various physics-related tasks and projects on a daily basis. This develops their skills in proper time planning and practical application of their knowledge.

Group work and collective knowledge sharing: In independent learning, students develop teamwork skills by working together and sharing their knowledge with each other. Group work in physics enhances the

exchange of ideas and cooperation between students in solving complex problems.

The connection between independent learning and professional competence in physics

Independent learning creates opportunities for students to self-study, conduct scientific research, and gain experience in practice. This process serves to develop all aspects of professional competence for students:

Analytical thinking: Independent learning in physics develops analytical thinking in students, which increases their ability to solve complex problems.

Creativity and innovation: Through independent learning, students develop the skills to generate new ideas and apply them in practice.

Problem solving: Independently solving complex problems in physics develops students' abilities to make decisions and find quick solutions in their professional activities.

Scientific research: Independent research and scientific research create opportunities for students to achieve scientific results and apply them in practice.

The organization of independent learning in physics in higher education is important for the development of professional competencies for students. Independent learning provides students with not only theoretical knowledge, but also practical skills, creativity, and scientific research. Effective organization of independent learning in physics is of great importance in preparing students for success in their professional activities.

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