

**PEDAGOGICAL MECHANISMS OF PREPARING STUDENTS FOR
SCIENTIFIC ACTIVITIES BASED ON AN INNOVATIVE APPROACH**

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Abstract. This article discusses the basics of using independent learning by future teachers in order to form innovative skills.

Keywords: teacher, education, innovation, independent learning, method.

**INNOVATION YONDASHUV ASOSIDA TALABALARNI ILMIY
FAOLIYATGA TAYYORLASHNING PEDAGOGIK MEXANIZMLARI**

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NamDU mustaqil tadqiqotchisi

Annotatsiya. Ushbu maqolada bo`ljak pedagoglarning innovatsion ko`nikmalarni shakllantirish maqsadida mustaqil ta`limdan foydalanish asoslari muhokama etiladi.

Kalit soʻzlar: O`qituvchi, ta`lim, innovatsiya, mustaqil ta`lim, metod.

**ПЕДАГОГИЧЕСКИЕ МЕХАНИЗМЫ ПОДГОТОВКИ СТУДЕНТОВ К
НАУЧНОЙ ДЕЯТЕЛЬНОСТИ НА ОСНОВЕ ИННОВАЦИОННОГО ПОДХОДА**

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Аннотация. В данной статье рассматриваются основы использования будущими педагогами самостоятельного обучения с целью формирования инновационных навыков.

Ключевые слова: учитель, образование, инновация, самостоятельное обучение, метод.

Problems and changes in all areas of society's life also affect the process of training future teachers in higher education institutions and impose new requirements. Currently, there is an urgent need for specialists and personnel who possess theoretical knowledge and practical skills, are able to adapt to changes, think freely, and independently solve their professional

and personal problems. At the same time, students in higher education institutions are required to have a high level of diverse erudition, the ability to think independently, and organizational skills. These requirements can be met through lifelong learning [4]. The formation and development of the student's ability to think independently and creatively, the preparation of future teachers for pedagogical activities based on a creative approach, the increase of their interest in knowledge, the development of the ability to think scientifically about problems, and the imagination of objective existence.

Independent work, organized in one form or another, has a positive impact on the development of independent and creative activities among future teachers. Independent work activates the mental, pedagogical, and psychological thinking of future teachers, develops their skills in working with educational literature, and enhances their ability to think independently. Sledovatelno, V prosesse podgotovki budutshix pedagogov K samostoyatelnomu obucheniyu neobhodimo razvivat U Nix naviki tvorcheskogo mishleniya. PRI sostavlenii I vipolnenii samostoyatelnix uchebnix zadani budutshiy pedagog doljen uchitivat vozmojnosti, odarennost obuchayutshixsya. The future teacher should take into account the capabilities, talents of the learners in the creation and implementation of independent educational assignments, take into account the necessary teaching tools when giving the necessary methodological recommendations for independent implementation.

In particular, in § 1 of Chapter 3 of the Concept for the Development of the Higher Education System of the Republic of Uzbekistan until 2030, entitled "Strategic Goals and Priorities for the Development of the Higher Education System," it is stated: "Increasing the proportion of independent learning hours, providing students with independent education, and critically developing the higher education system." and creative thinking, system analysis, the development of entrepreneurial skills, the introduction of methods and technologies aimed at strengthening competencies in the educational process, the orientation of the educational process towards the development of practical skills, and the introduction of international educational standards in this regard. Due to the fact that the development of students' organizational skills in the process of independent education is considered a problem, the new version of the Law of the Republic of Uzbekistan "On Education", approved on September 23, 2020, also stipulates that "independent education is carried out individually and serves the professional, intellectual, spiritual, and cultural development of students" [2]. The transition is possible. As is known, reducing the amount of classroom work through the use of credit-based learning technology directly increases the significance and status of a student's independent

work. If in the traditional system of education independent work is one-third of the total labor input of the studied educational course, then in the credit system of education-two-thirds of this part. Therefore, independent work of the student in the conditions of credit technologies contributes to the improvement of the quality of education and the improvement of the quality of training of future specialists. Independent work of students is divided into two types:

- in the classroom,
- outside the classroom.

Independent work of students in the classroom is carried out in the classroom under the direct supervision of the teacher and according to his instructions. Independent out-of-classroom work is carried out by students according to the teacher's instructions, but without his direct participation. The pedagogical significance of independent work also depends on how the students' activities are organized. The forms of organizing independent work have an important educational significance. Independent work in higher education is a specific means of organizing and managing students' independent activities during the learning process, as well as a means of self-organization and self-education for students in acquiring the necessary knowledge, skills, and abilities.

The very concept of "independent work" implies a wide range of activities and areas. The specific meaning of the term "independent" depends on the context. Generally, this term has three meanings:

- the student must complete the work independently, without the teacher's direct involvement;
- the students are required to perform independent thought processes and navigate the learning material independently;
- the work is not strictly regulated, and the student has the freedom to choose the content and methods of completing the assignment.

Currently, there are two forms of independent work in universities:

- traditional, i.e. independent work of students, performed in an arbitrary mode and at a time convenient for the student, often independently outside the classroom.
- independent work in the classroom under the supervision of a teacher, from whom you can get advice during the performance of the task. The educational process based on independent work of students can be divided into two types. The first is the growing role of independent learning in the educational process. Implementing this approach requires teachers

to develop methods and forms of organization that promote a high level of student independence and improve the quality of education.

Secondly, there is a need to increase student engagement in all areas of independent work, including those outside the classroom. It is important to recognize that independent student work should not only be an important part of the educational process, but also its foundation. The decisive role in organizing independent work belongs to the teacher, who should work not with the "general" student, but with their individual characteristics, strengths and weaknesses, abilities and inclinations. Work in the classroom under the direct supervision of the teacher-educator;

work is performed outside the classroom;

creative work, including research work.

The most suitable form of evaluating students' results in a subject is a measurement system. When developing a scale for evaluating the results of a student's independent work, it is necessary to differentiate the tasks for independent work based on their level of complexity. The ability to learn and educate oneself is impossible without such a personal quality as independence, which, in turn, is developed through independent and only independent activities. Therefore, independent learning activities should be the primary focus. Unlike traditional approaches, the credit-modular education system, which predicts a much greater amount of independent student work, is actively trying to make it truly leading.

In addition, it is necessary to add questions about the accurate implementation of independent student work, primarily using modern information and communication technologies. Research in this area exists, but in our opinion, it is limited to specific topics (courses), such as the use of the Internet in master's-level English language learning without a core, students' independent work using computer-based mathematical systems in the course of mathematical analysis with electronic educational modules at the department, etc. Taking into account all of the above, it is necessary to analyze the state of the organization of independent work of university students and analyze it in the conditions of the Bologna process.

The analysis of the psychological and pedagogical literature of this direction showed the active beginning of research on the issues of independent learning of students in the middle of the XX century, although at the beginning of the last century I. Hessen emphasized that the source of the development of the Earth is active and independent work. And the student's personality is created not only by the words written or spoken by him, the movements of his hands, but also by the thoughts, feelings and emotions, desires and arbitrary actions that he

experiences at that time, as well as by the state of his soul. In our opinion, the activity and independence of intellectual work should be complemented by its acute necessity, usefulness, and, of course, its creative nature.

Among such skills, Yu.Miroshnichenko and O. Trojan are characterized by:

- rational use of time, alternation of work and rest, rules of hygiene of educational work;
- search for information, work with catalogs, dictionaries, encyclopedias, network resources, etc.;
- speed reading technique;
- semantic processing of texts, highlighting the main (ideas, laws, principles);
- concentration and memorization;
- listening and speech culture;
- brief rational recording of information (extracts, theses, plan, synopsis, abstract, review, summary, etc.);
- preparation for lectures, seminars, laboratory and practical work, as well as for graduation classes of modules.

Considering the issue of students' independent work, it should be noted that from a psychological perspective, independent work is an activity that must be understood, internally motivated, and aimed at satisfying cognitive needs. Thus, the teacher has many roles, and in the context of the credit-modular learning system, we believe that the teacher should first be a motivator, then an assistant, and in the process of activity, a mentor, moderator, and consultant. In other words, when instructing students, the teacher should encourage them, provide a convenient environment for independent work, and coordinate and consult students during the learning process. Thus, independent work is the basis of self-learning, and it also contributes to the formation of the student's readiness for self-learning. V. Kurinsky and S. Dneprov consider the concept of "autodidactics" to be essentially synonymous with self-learning. The essence of self-learning is the conscious self-organization of the process of acquiring knowledge and necessary skills. It contributes to the development and improvement of personal qualities, abilities, and skills through self-education and self-development. All three components (self-education, self-education, and self-development) are closely related, but none of them is the primary component.

The effectiveness of self-learning, self-education, and self-development depends on the students' independent activities, which are based not only on the development of the individual's volitional processes, but also on a stable motivation, i.e., a system of motives that determine

specific forms of activity and behavior. Any person can provide an example. Bukina, A. Verbsky, and others. Independent work contributes to the development of independence as a fundamental personality trait. Independence is a quality of the individual that manifests itself in initiative, critical thinking, sufficient self-esteem, and personal responsibility for one's actions and deeds. Thus,

- independently establish and systematize the order of their work;
- independently plan the sequence of their actions;

- independently monitor and correct these actions, namely: monitor their progress, make changes and clarifications. To develop the independence of students, in our opinion, it is necessary to determine the level of readiness of students for independent educational activities; if possible, to increase this level and, accordingly, to organize independent work, taking into account the individual characteristics of students, the level of preparedness and the necessary motivation. The criteria for the development of personal independence can be considered to be the intensity of tasks offered for independent work, as well as the percentage of tasks performed under conditions of self-organization, in relation to the total number of tasks offered in a particular discipline.

In addition, the work should be carried out with interest. Thus, the analysis of scientific literature has revealed the main approaches to defining the concept of "independent work", namely:

- types of individual and group cognitive activity of students carried out in classroom and extracurricular activities (R. Nizamov, N. Sagina);
- various educational tasks carried out under the guidance of a teacher (P. Pidkasistiy, M. Kharunov, N. Nikandrov);
- a system of work organization in which the management of students' educational activities is carried out in the absence of a teacher and without his/her direct assistance (V. Graf, I. Ilyasov, N. Sagina);
- students work according to a special individual educational program, compiled on the basis of individual characteristics and cognitive capabilities of students (S. Arkhangelsky, L. Derkach, I. Shaidur, A. Chiz);
- a specific type of educational activity, the main purpose of which is to form the independence of the subject

Thus, in the credit-modular learning system, students' independent work is the main form of learning organization, which includes individual and collective types of educational

activities, as well as activities carried out under the guidance of a teacher, taking into account the individual characteristics and cognitive abilities of students, in classrooms and during extracurricular activities, but under the guidance of a teacher, but without his direct participation. The purpose of students' independent work is not only to develop students' ability to independently acquire knowledge and navigate the flow of scientific information, but also to develop their active and independent thinking as a necessary condition for self-learning and self-realization in a democratic society. It should be noted that the main features of organizing students' independent work in the context of the Bologna Process are:

- 1) the main part of the educational material is provided for independent study and assimilation;
 - 2) the creation of special didactic materials for independent work;
 - 3) the order of individual study of individual subjects and individual learning schedules, the study of educational material at an individual pace;
 - 4) the change in the teacher's responsibilities (organization, management, consultation, and control);
 - 5) the change in the student's position (initiative in working on educational material, independent planning of their own work, responsibility for implementing their individual plan, etc.)).
- The main way to improve the efficiency of independent work for university students is to use information and communication technologies extensively in the credit-modular learning process.

Independent work is considered an important element of students' education and upbringing. In this case, the teacher transforms from a knowledge translator into a leader of the educational process, organizing and directing students' cognitive activities. The effectiveness of independent work is determined by its competent organization. The main characteristics of students' independent work (TMI) include psychological prerequisites for success, the professional focus of disciplines, and the limited time budget of the student. Individualization of independent work includes the following variables: increasing the proportion of intensive work with more prepared students; dividing lessons into mandatory and creative parts; regular consultations with students; comprehensive and timely information about the subject content, deadlines, needs for auxiliary tools, forms of independent work, and methods of monitoring and evaluating final results. Depending on the location and time of the event, as well as the method of guidance and control by the teacher, the following types of independent work are distinguished: independent work during the main classroom activities (lectures, seminars, and

laboratory work); independent work under the teacher's supervision in the form of scheduled consultations, creative contacts, tests, and exams; independent work at home for educational and creative purposes; and independent work outside the classroom while performing duties.

Systematically, TMI can be divided into two parts: independent work organized by the teacher, and organized by the student at his own discretion, without the direct supervision of the teacher (preparation for lectures, laboratory and practical classes, tests, colloquiums, etc.), TMI management is, first of all, an opportunity to optimize the process of combining these two parts. Tasks for independent work should correspond to the goals of different levels, reflect the content of each proposed discipline, and include various types and levels of cognitive activity of students. Technology of control organization. It involves a careful selection of controls, the definition of stages, and the development of individual forms of control. The main forms of organizing students' independent work in pedagogical universities are determined by the following parameters: the content of the discipline; the level of education and preparedness of students; the need to simplify the workload in students' independent work. Based on these parameters, the classic forms of assignments given by a teacher are: graduation papers; semester assignments; term papers; term projects; documents on the certification of a bachelor, specialist, and master. The reforms currently being implemented in the education system contribute to the development of independent thinking among students.

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