INNOVATIVE APPROACH TO INDEPENDENT LEARNING OF STUDENTS IN THE INFORMATION AND EDUCATIONAL ENVIRONMENT

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ABSTRACT

The article describes the stages of organization, organizational forms, main aspects, classification, types and approaches to self-creation and organization of self-study and its didactic goals in the information and educational environment for students of higher educational institutions. In addition, ways to improve the information learning environment through an innovative approach to the organization of self-study of students are disclosed.

Keywords: Information and educational learning environment, information and communication technologies, SMART technologies, interactive software, independent learning, motivation, cognition, reproductive (according to the model); reconstructive-variative, partially research (heuristic), creative (creative) tasks, classroom activities, extracurricular activities, innovative approach, systemic approach, task form, cluster, conceptual table, mental map, network technologies, blog, mediaportal.

INTRODUCTION, LITERATURE REVIEW AND DISCUSSION

In the process of globalization, special attention is paid to the widespread introduction of information and communication technologies in the education system, the creation of a database of information and educational resources and the organization of self-study of students at the level of modern requirements. In teaching biology, the use of information and communication technologies, SMART technologies, interactive software has a positive effect on the formation of students' scientific-theoretical and professional-methodical knowledge, skills and professional competencies.

The system of higher education uses various organizational forms and types of self-study in the preparation of future biology teachers for professional activities. The place and time of self-study, didactic goals, types of learning activities, the material being studied are characterized in terms of intra- and interdisciplinary relationships.

Self-study of students has a number of features, which include:

- carried out independently outside the class schedule;
- performed on the basis of individual assignments;
- carried out using modern educational and information technologies;
- is carried out in parallel with classroom work on the subject;
- independent work outside the classroom is carried out on the basis of the curriculum in a particular subject, but is carried out continuously with the classroom, in a strict order and at a certain stage;

First stage. Creation of pedagogical and organizational conditions. Independent work of students has certain components, and for its formation it is necessary to create pedagogical and organizational conditions in which tasks are set on the basis of certain principles and programs.

Properly organized self-study in subjects, on the contrary, ensures the formation of such competencies in students as “knowledge”, “performance” and “application”;

Second phase. Formation of motivations. For the organization of self-study of the student, first of all, the motivation of students is formed. At the same time, the attitude of students to the content of a particular subject is studied, the essence of science, its significance in their lives and in society is explained, their interests are increased. As a result, students understand the essence of science, feel the need to complete independent learning tasks, and then proceed to their implementation individually and in groups.

Third stage. The development of cognition. At the motivational stage, a student with an increased interest in learning develops cognitive functions (know and apply in practice) as he completes independent learning tasks. The cognitive process is carried out on a technological basis in almost all components of the education system (goal, essence, method, means, form of organization, control, result, assessment, analysis, correction, forecasting), using didactics and means of communication. As a result, the student independently models and builds hypotheses; apply knowledge in practice; the ability to independently set tasks and acquire new knowledge based on their solution, self-assessment skills are formed. This ensures the structure, continuity, quality, efficiency and effectiveness of the didactic process.

In the organization of independent work of students in self-study, the following aspects can be distinguished:
1. Work that requires mental, strong-willed and physical strength of students;
2. Work of a cognitive or practical nature;
3. Work that combines problematic situations;
4. Independent work, requiring a creative approach to solving problems of a cognitive and practical nature;
5. Work involving the planning of one's activities, its scientific organization, the fulfillment of tasks without the help of others, an objective assessment of the results of work;
6. Work, which includes the regular progress of work, monitoring results, making changes as needed and improving implementation;
7. The desire to complete the tasks set, which in turn allows you to holistically develop the student's personality, methods of mental and practical activity, independent work and work, which contributes to the formation of creative abilities.

It is clear that in the process of self-study, one should not allow the student to simply do independent work. Each independent study requires the solution of a specific problem. It is important that the student is able to think independently. This process begins with the creation of a problem situation. Most importantly, independent work develops students' ability to think independently. Such students will have aspects that provide research creative activity, which is the basis for quick, clear and correct decision-making in non-standard or unexpected situations [5; 165-b.].

The group of independent teaching methods includes textbooks, additional educational literature, working with visual aids, solving problems and exercises, experimenting, working with information and communication technologies, collecting, analyzing and processing data. One of the features of the independent learning method is that students do their homework without the direct supervision of the teacher. The method of independent work involves the organization and management of independent educational activities of students.

According to the classification of independent learning tasks, the authors classify them into the following types [3; 113]:
1) processing (according to the sample);
2) reconstructive-variative;
3) partial research (heuristic);
4) creative (creative).

1. Independent work of the type of processing (according to the model) includes the task of processing knowledge and skills. All information for finding what you need, as well as a way to complete the task, will be given in the task itself or in the corresponding solution algorithm. This work helps the student to collect key evidence and methods of action, consolidate skills and competencies, master the basic educational material in a relatively short time, but provides a weak level of development of students' creative abilities. At the same time, work on samples allows students to move on to highly active activities and independent tasks.

2. A feature of independent work of a reconstructive-variative nature is that the general idea of the solution is already stated in the problem itself, and the student must develop it in a certain way or in a way in relation to the conditions for solving the problem. The student associates it with other reproductive tasks known to him. The key here is the ability to activate the acquired knowledge, to select and use the knowledge necessary to solve the problem.

Reconstructive tasks include tasks that require the use of several algorithms, formulas, instructions, for example, some stages of laboratory work (classroom exercises) and extracurricular work [2, 198].

3. Independent learning tasks of a partially research or heuristic nature. Unexpected situations are presented in the form of non-standard tasks. It is based on the search, in the assumption, formulation and implementation of an ideological solution, but research is only partially necessary for part of the overall task. These tasks include special courses, special seminars, some term papers, final qualifying works. At the same time, the student during the assignment is engaged in practical activities, analyzes problem situations and finds solutions. In the process of performing this kind of work, the student's research experience increases, he acquires elements of creativity, but does not accumulate experience in conducting holistic research.

4. In the process of creative-scientific research work, the highest independence and cognitive activity of the student is manifested. Through creative work, he delves deeper into the essence of the phenomenon under study, finding new ideas in solving problems. The implementation of these types of tasks contributes to the mastery of the methods of scientific knowledge by students, the development of creative activity [3; 15-b]: see new problems in familiar standard conditions, understand a new function of a familiar object, find alternative solutions, etc. Creative work includes:

1) understand the purpose of the work;
2) put forward and substantiate a hypothesis;
3) determination of research methods;
4) testing ideas;
5) making corrections;
6) conclusions on the problem;
7) setting the topic in new situations (with an unfounded hypothesis);
8) Changing the decision methods[6; 32-33].

Below we have tried to give examples from independent learning tasks based on an innovative approach. Tasks for the acquisition of new knowledge, skills and abilities according to the

didactic goal are prepared in the classroom in accordance with the content of the new, now mastered topic. When solving such tasks, the use of various methods should be provided. For example, if a task is set before the study of new material, waiting to be solved using methods such as “Why?”, “How?”, He will try to find a solution to the problem posed during the development of the topic. For example, using the Why? in the course of microbiology in the form of "Why can viral and bacterial diseases cause epidemics and pandemics?", the problem is posed before studying the topic (Fig. 1), using the "How?" the cause of the problem situation associated with the present time is determined, and also finds ways to solve this problem using this method.

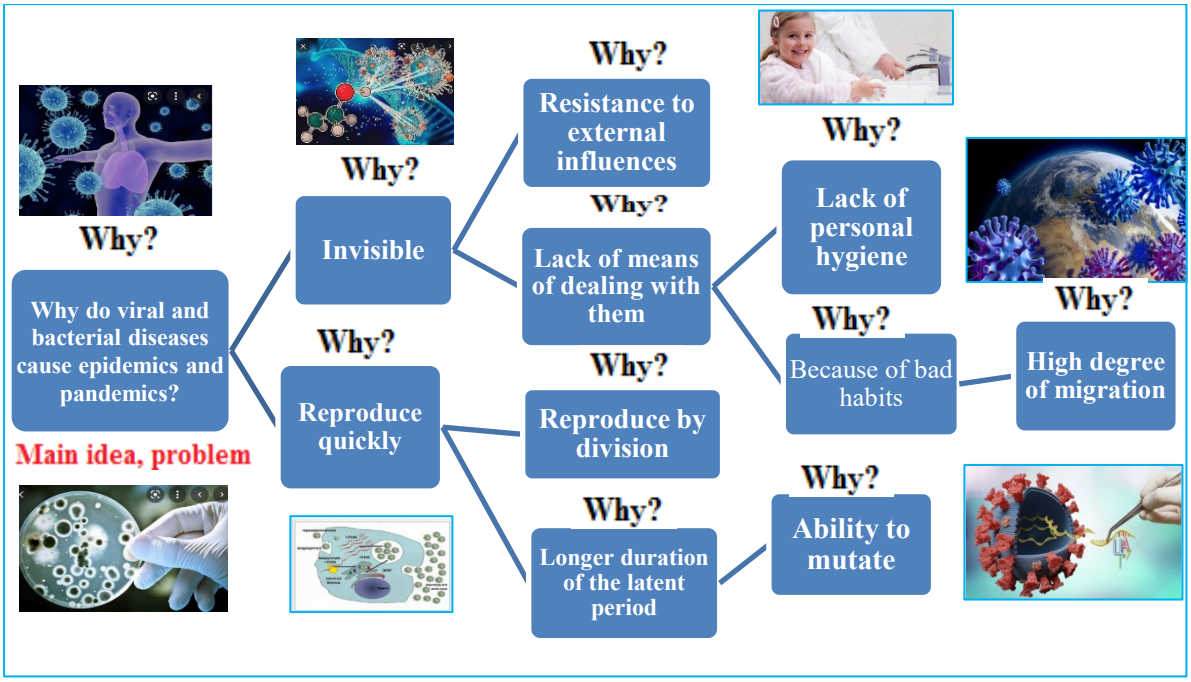

Fig. 1. Studying the cause of the problem using the "Why?" (sample)

The complexity of the formation of a didactic process in the discipline of biology teaching methodology lies in the fact that it requires an innovative approach to learning, depending on the type of educational technology and modern requirements. Below is the "Mental Map" task based on an innovative approach.

Assignment on "Methods of teaching biology". Create a cluster of "Biological Concepts" and transform it into a "Mental Map" (Fig. 2). The order of the task: Write in the circles the types of biological concepts and determine which animals are shown in the picture, what kind of object it is, explain to which biological concepts they correspond and analyze it using the “Conceptual Table” method, then fill in the table (Table 1) .

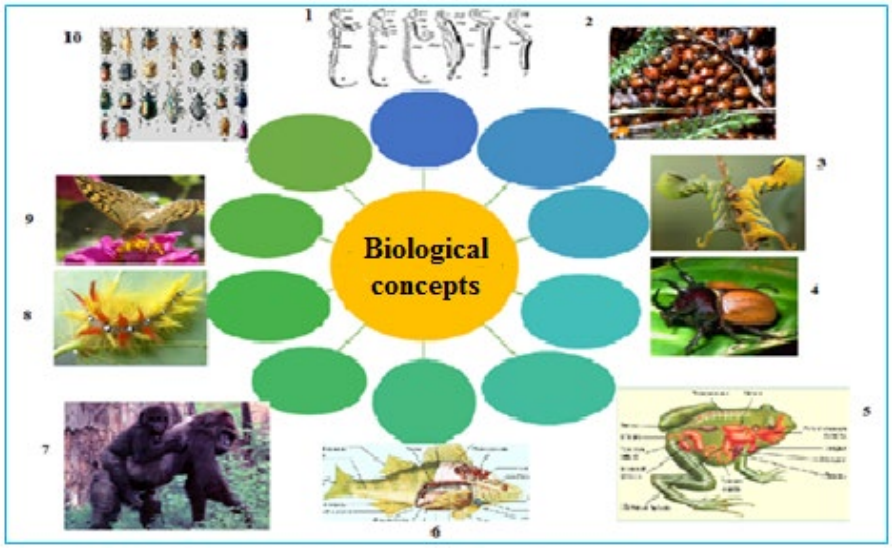

Fig.2. "Biological concepts" - cluster "Mental map"

(Table 1) Fill in the "Conceptual Table" (using Fig. 2.)

№	Biological concepts	The name of the objects given in the picture	Peculiarities
1	Morphological, ecological	butterfly trunk structure	The reason butterflies have different trunk structures is because their food source is different. This, in turn, indicates the peculiar structure of the flower that they feed on.
2			

The student performs this task by combining the techniques studied in the subject with the scientific and theoretical knowledge obtained in his specialty, as a result of which the knowledge, skills and abilities acquired in the subject are consolidated.

Under the guidance of subject teachers, students perform the following organizational forms of self-study in subjects according to the curriculum [8,51] (Fig. 3):

In the process of performing independent learning tasks, students are guided by the initial research activity, in which they become motivated to scientific research [2,155].

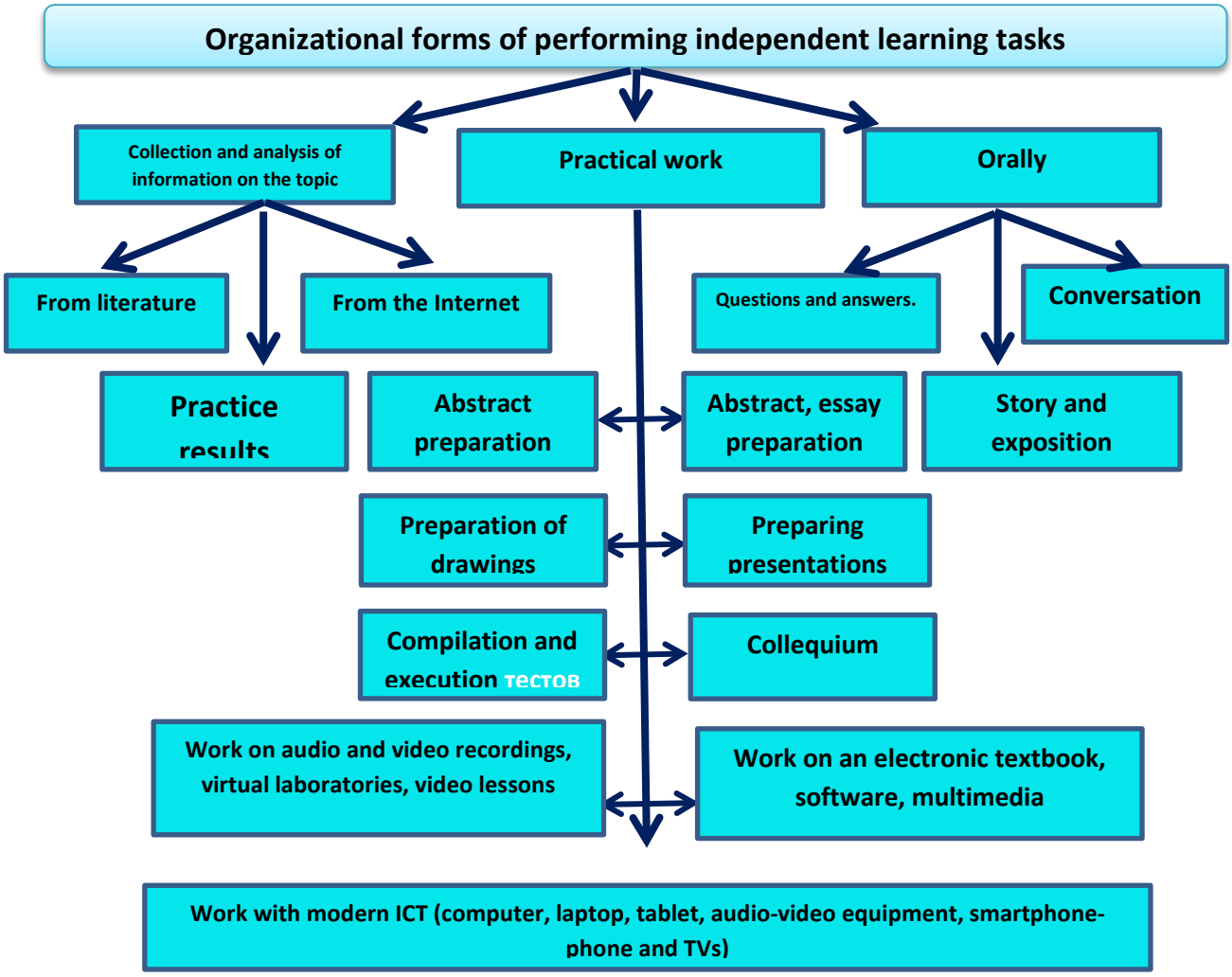

Fig. 3. Organizational forms of performing independent learning

For example, in the working curricula of such disciplines "Methods of Teaching Biology" and "Technologies for Teaching Biology and Design", a plan of independent learning tasks is provided for orienting students to additional, independent research and scientific activities, which is introduced and presented to students at the introductory lesson. The plan provides for independent learning tasks in the form of classroom and extracurricular activities at universities, as well as distance learning - online lessons using information and communication tools (Fig. 4), which provide for the implementation of a variety of independent learning tasks to study the content of the subject.

1. Independent work performed in classrooms and as extracurricular: lectures, seminars, practical and creative tasks for practical and laboratory classes, oral, practical and visual tasks and tasks performed using ICT.
2. Independent work performed as extracurricular: written homework assignments (notes, abstracts, developments and flow charts of lessons, questionnaires, tests), preparation for the discussion of lecture materials (reading), designing term papers and WRC, individual independent work in pedagogical and field practice and others (Fig. 4).

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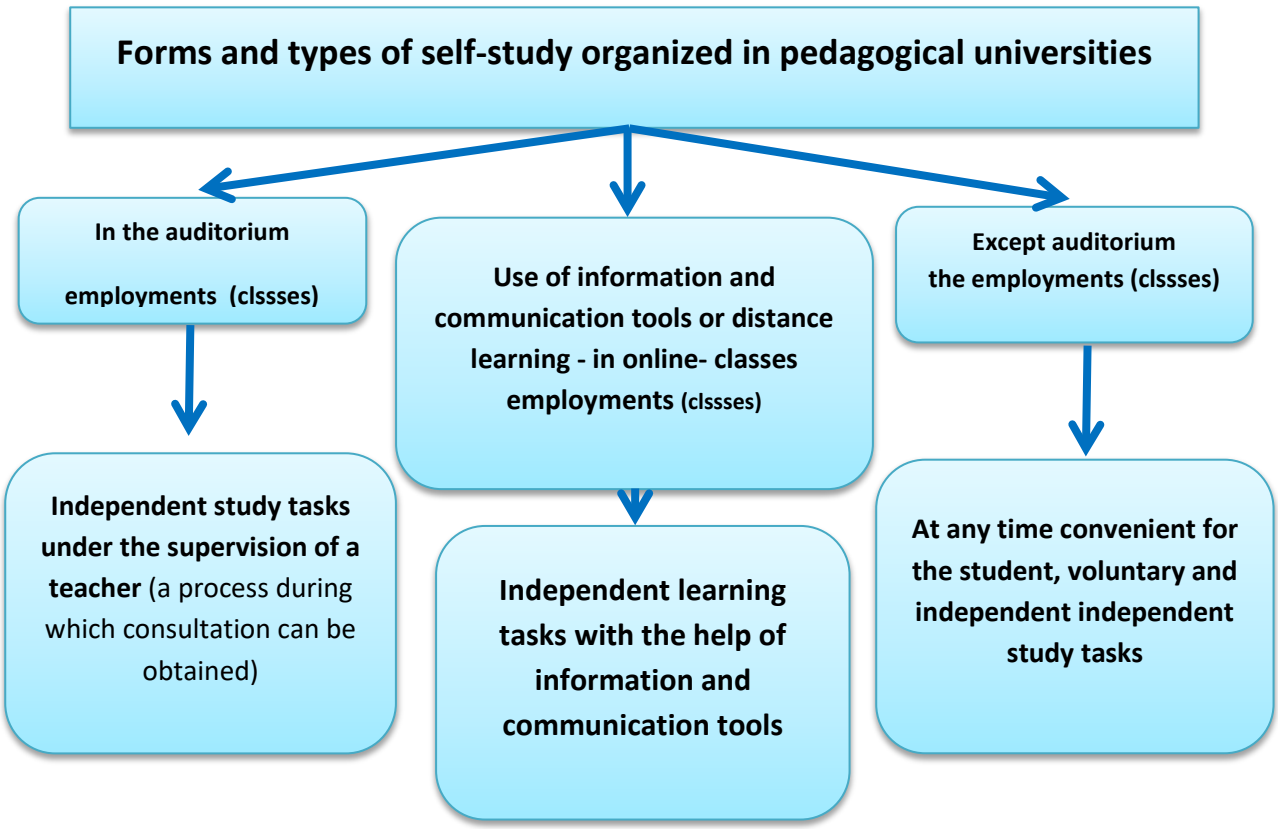

Fig. 4. Classification of SIW (student independent work) in pedagogical universities by place of organization.

In the course of independent work, the student, while reading, analyzes literature, studies Internet information, makes notes, prepares abstracts, slides, drawings, and performs test tasks. Based on an innovative approach to independent learning tasks, students work on electronic textbooks, projects, thematic videos, animations, multimedia programs, virtual laboratories using information and communication tools (computers, laptops, tablets, SMART phones, TVs, interactive whiteboards), pass collequium, etc.

At present, the number of hours devoted to independent work in subjects is increasing, and therefore the issue of using network technologies in the practice of full-time education is becoming increasingly relevant. It is advisable to use network technologies at the stage of formation of independent learning.

Network technologies (blogs, e-mail, newsgroups, distance learning platforms, ZOOM software, web forums and chats) serve as the basis for conducting SIW, as they provide students with educational materials, and are also used by the teacher and student to establish interactive interaction between them . The use of blogs in the educational process has a number of advantages over other network technologies, as it allows you to publish reviews, creating a network communication environment. This allows the student to connect directly to the Internet using a computer or mobile device and independently access, complete or upload subject matter information and self-paced assignments required for a particular area.

The improvement of network technologies, especially the educational functions of the blog, the expansion of its functionality will allow the use of widgets and gadgets. Their use greatly simplifies the work with information, makes it more visual and easy to perceive, saves time spent on accessing and processing information, i.e. allows students to use the tools they need to successfully complete assignments.

In order to improve independent work on the subject "Methods of Teaching Biology" for 3rd year students of the specialty "Methods of Teaching Biology" we have a blog designed to support the course with the following structure - "Biology Media Portal" (http://bio.portal.ru)

The department "Methods of teaching biology" in pedagogical universities provides for the organization and implementation of the following types of independent work on content (Figure 5).

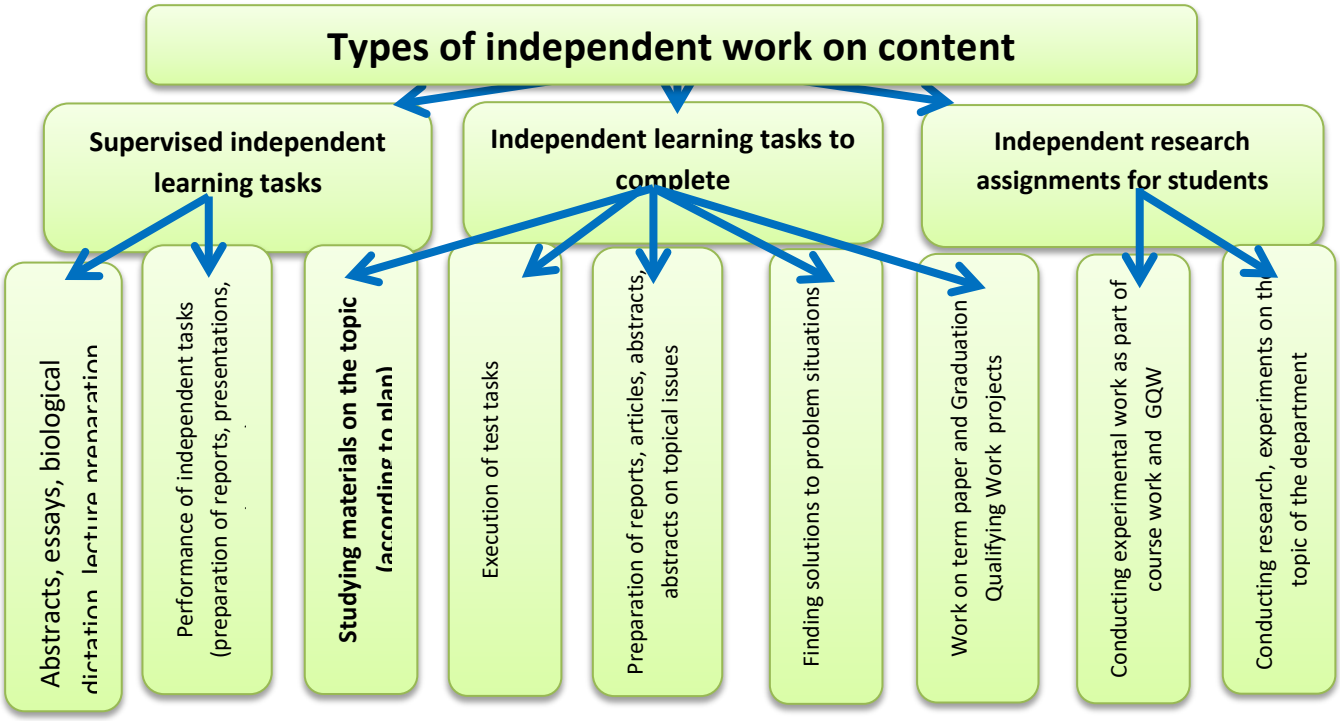

Fig. 5. Types of organization of independent educational work of students in pedagogical universities.

All of the above types of independent learning tasks can be adapted and applied to various forms of learning activities carried out in all types of higher education institutions.

Any kind of activity in the education system is described in accordance with its didactic goals. Independent learning is also subdivided according to didactic goals: the acquisition of knowledge, the systematization of knowledge, consolidation, generalization, the formation of skills, abilities, competencies (Table 2).

Table 2: Types of independent learning tasks for didactic purposes

Types of self-study for didactic purposes		
Acquisition of knowledge	**Systematize and consolidate knowledge**	**Formation of skills and competencies**
-reading the text (textbook, primary source, additional literature); - create a text plan; -image in the form of a diagram of the structure of the text; - Note-taking; - text division; - work with dictionaries and reference books; - educational and research work; - audio and video recordings Computer techologies, using the Internet	- Working with lecture notes (text processing); - Rework of educational material (textbook, primary source, additional literature, audio and video) - planning and summarizing answers, compiling a table; - preparation of answers to control questions; - Analytical text processing (abstract, review; -preparation of information at seminars, conferences; - preparation of abstracts, reports; -Bibliography, crossword puzzles, tests, etc.	- solve problems and exercises according to samples; - work on variable tasks and exercises; - drawings, summaries of schemes; - execution of drawings; - solution of situational problems; -Ready for business games; -design and modeling; -Conducting experimental work; - implementation of virtual laboratories; - performance of simulation tasks; - Reflective analysis of audio and video content.

In conclusion, we can say that the organization of self-study of students at the level of modern requirements due to an innovative approach to the organization of self-study of students in the information and educational environment, students' awareness of information, its intended use, independent research. critical, analytical and innovative approach, they develop professional qualities, both personal and professional, their independent professional activity is formed. This, in turn, improves the quality and competitiveness of personnel.

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