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METHODOLOGY OF USING CONNECTING ELEMENTS OF SCIENCE IN THE ORGANIZATION OF INDEPENDENT WORK OF THE SCIENCE OF HYDROELECTRIC POWER STATIONS

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Annotation
The article develops the methodology of organizing the independent work of students based on the integration of geogasodynamics and hydroelectric power stations, gives the theoretical basis and describes the methods of application in practice.

Keywords: credit-module system, integration, Independent Education, independent work, General Education, Polytechnic Education, Professional (professional) education, didactic material, independent assignmen

Introduction

The radical reform of the education sector is one of the most important problems for the Republic of Uzbekistan today. Therefore, in order to achieve the development of the higher education system of the Republic of Uzbekistan and its competitiveness with the education system of developed countries, the task of gradually transferring the educational process to the credit-module system, especially in higher education institutions, was laid down in the decree № PF-5847 “on approval of the concept of development of the higher The credit-module system is mainly aimed at raising the efficiency of the independent work of students (TMI) to an adequate level. The theoretical and practical research carried out on the implementation of the tasks set out in the decree from the president to the end is topical in modern times. Anashu is one of the urgent issues-to carry out the independent work of students using integration of science.

The main goal is to organize the independent work of students in the education system of our country, as well as in developed countries, and to create the need for it.

Higher education based on the competitiveness of national personnel and international practice in the "Action Strategy for the five priority areas of development of the Republic of Uzbekistan for 2017-2021", approved by the Decree of the President of the Republic of Uzbekistan dated February 7, 2017 No. PF-4947 [2] accession to the Bologna Declaration of June 19, 1999, which promotes the improvement of the quality of the national system, the mutual recognition of diplomas of the member countries of the Bologna Process, and the implementation of exchange programs with teachers and students.

In the "Concept of development of the higher education system of the Republic of Uzbekistan until 2030", approved by the Decree of the President of the Republic of Uzbekistan dated October 8, 2019 No PF-5847 [1], the introduction of digital technologies and modern teaching methods in higher education; Specific tasks have been set to increase the effectiveness of TMI, fight corruption, increase the share of students studying in engineering and technical education, introduce a credit-module system, increase the share of practical training in special subjects to improve practical skills in the curriculum.

Zokirova D.N. The theoretical and practical significance of the process of interdisciplinary integration in the teaching of students is highlighted in the scientific-methodical research work "Integration of professional and general sciences in teaching students to learn independently" [3]. In the teaching of science, the functions of interdisciplinary communication are analyzed and attention is paid to its multifaceted aspects. The difficulties encountered by educators in the process of interdisciplinary communication are highlighted.

[4] Scientific and methodological research has shown that the practice of interdisciplinary communication in education can be different: questions, specific tasks, problem situations, research and practice-type tasks, all of which increase the effectiveness of the educational process.

[5] The methodical research analyzes the positive effects of the use of interdisciplinary links in the field of engineering education on the effectiveness of the educational process, students' in-depth knowledge and effective use of time. listed.

O.U.Otamirzaev, D. N.Zokirova's research [6] focuses on the hybridization of technical sciences and highlights the importance of interdisciplinary integration in modern education.

[13, 14, 15] The scientific-methodical research work describes some methods of organizing independent work on the disciplines "Theoretical Foundations of

Electrical Engineering" and "Electrical Machines". It provides the practice of developing practical training issues on the basis of didactic (illustrative) materials, ie schemes, pictures and graphs, and their application in the educational process to improve TMI. It is recommended that the student create the terms of the issue independently.

The following principles and methods are selected in the formulation of the problem: 1) all issues are presented in the form of a scheme; 2) the terms of the problem are not given in the open text, the student has the opportunity to compile it on the basis of the scheme and hydraulic sizes; 3) it is recommended to find hydraulic quantities on the basis of literal values in the scheme; 4) Each task consists of 5 differentiated exercises, which allows students to self-assess.

[7,8,9] The scientific-methodical article reveals the methodological principles of TMI and shows its main forms. The role of the department and teachers is analyzed as a whole.

The connection between disciplines is one of the main problems of educational didactics. The continuity, continuity and interdependence of general, polytechnic and vocational education is ensured primarily through interdisciplinary links.

The relevance of interdisciplinary integration in the areas of technical education can be justified by the fact that engineering activities are becoming more multidisciplinary and multifaceted, but the time budget allocated for teaching them all in higher education is limited. Indeed, the amount and type of knowledge that students need to acquire in these areas of education is increasing. In such conditions, knowledge at the level required by the educational standard can be provided only on the basis of systematization of interdisciplinary links and their rational use. In our opinion, interdisciplinary connection is an interdependence between the basics of academic sciences, or more precisely - the integration of elements of different disciplines. There are opinions that it would be expedient to see and apply interdisciplinary communication at the level of academic topics.

The creation and implementation of an interdisciplinary educational complex is a new didactic model. It is an integrative didactic system, which includes a course of lectures, laboratory-practical training system, educational project (work), integrative-pedagogical tests, information technology tools. First of all, it is expedient to create an interdisciplinary educational complex on the integration of closely related mathematical and natural sciences and general professional sciences. Let us consider the methodology of creating an interdisciplinary technological map, which can be taken as a single component, for the direction of alternative energy sources. The general professional disciplines in this field of education - Small hydroelectric

power stations, hydrogasodynamics, electrical engineering and electronics and other sciences, mathematics and natural sciences - are based on higher mathematics, physics, theoretical mechanics and other sciences. Therefore, an interdepartmental expert group will be formed and a set of key words and phrases on specific and related topics will be created. In this case, the science of small hydroelectric power stations can be taken as a basic science. The key words and phrases in these science topics are distinguished on the basis of what concepts the previous sciences were based on. It is advisable to create a technological map for both schemes and formulas. The form and content of the technological map cannot be strictly limited, it can be in tabular form, in cluster form or otherwise. It can also be composed of 2 or more interrelated disciplines.

When structured on the basis of two science topics, it is advisable to point out the time disparities in their teaching. A model for the implementation of interdisciplinary links between small hydropower plants and hydrogasodynamics has been developed (Scheme 1). It is used in the development of working curricula and programs of science. Technological mapping also helps to harmonize the terms, letters and other definitions used in the sciences, the units of measurement of quantities and their spelling.

One of the most important aspects of the interdisciplinary technology map in education is that for each subject of the chosen subject, students have the opportunity to create, select and justify independent work assignments [10].

The main source of general technical knowledge is the natural-mathematical cycle sciences (hydrogasodynamics, physics, chemistry, materials science, computer science and programming, drawing, etc.). The polytechnic principle of education requires that there be a connection and reciprocity between general education, general technical and special disciplines. Proportionality is the study of a science based on the rules of the previous science and its effective use. Table 1 shows the structural elements (technological map) of interdisciplinary interaction. It contains general, polytechnic and professional concepts and indicates which disciplines they belong to. The identified general concepts characterize the theoretical foundations of general technical and special sciences. They play an important role because these concepts shape students 'dialectical worldviews. Polytechnic concepts interconnect general scientific and professional concepts. They are based on general technical and natural-mathematical sciences.

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Table 1 Structural elements of interdisciplinary interactions

Technical tools and functions of them	Structural elements			Educational Sciences that study these concepts
	General concepts	Polytechnic concepts	Professional concepts	
1	2	3	4	5

The use of elements of communication in the field of Computer Science and science of small hydroelectric power stations ensures the implementation of the following pedagogical tasks:

1. To provide in-depth study of equipment, technical facilities and technological processes of particular importance for the future professional profession.
2. To carry out the study of these facilities on the basis of the independent work of the students with the help of additional literature.
3. On the basis of the curriculum of the science of small hydroelectric power stations determine the departments and subjects that study the above objects, establish independent work assignments on the basis of determining the elements of their connection with the course of hydroelectric power stations.
4. To identify the methods by which students are introduced with the structure and principles of performance of the selected technical facilities and to define the use of elements of the Bunda gidrogazodynamics course as an independent assignment.
5. To determine the form of conducting educational activities of a sciencelararo character, in which to determine the methods of pedagogical technology that ensures the activity of students.
6. Sciencelarar full achievement of educational objectives through the preparation of didactic materials, which are reflected in the elements of the link for the subjects with the character of the link.

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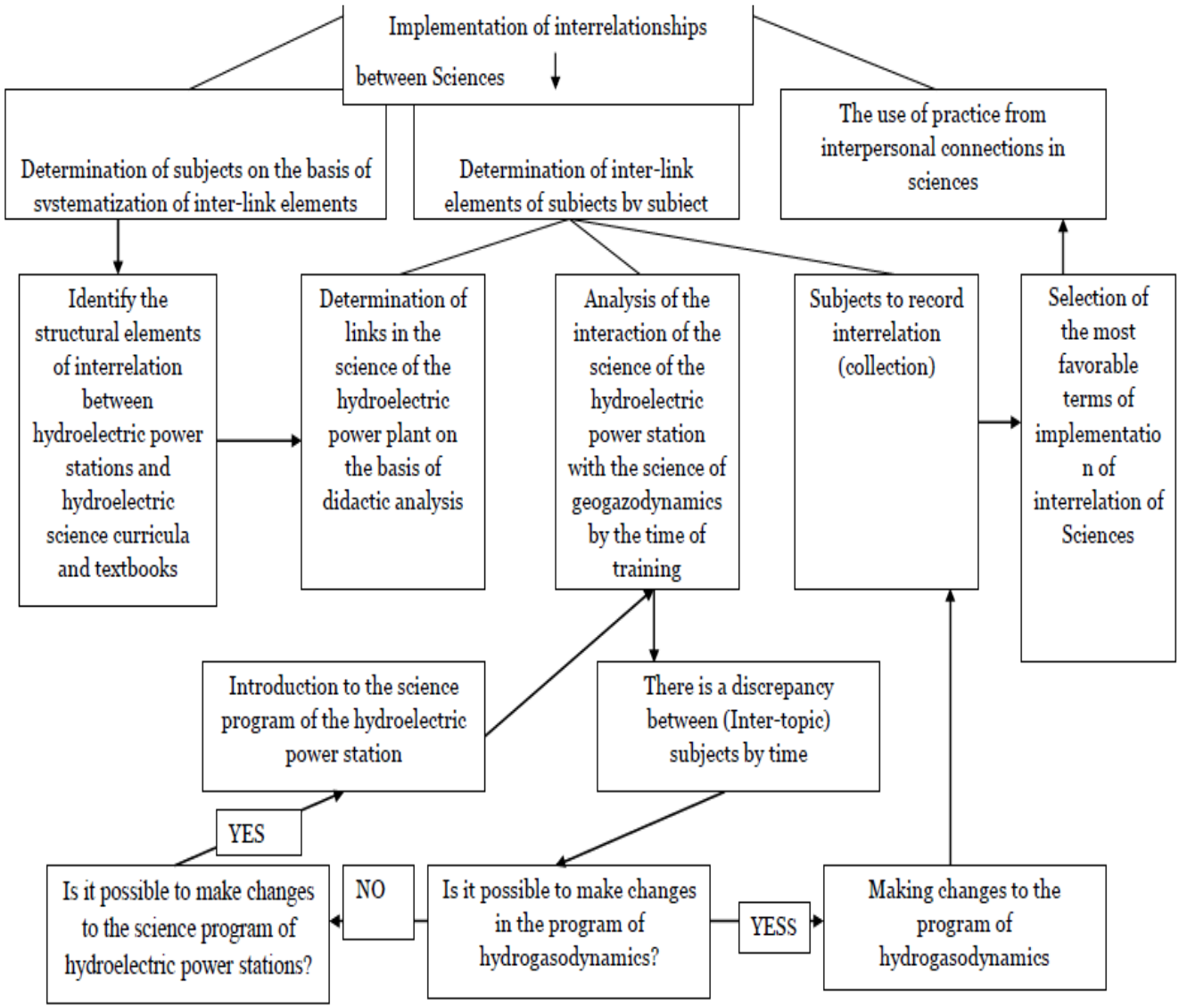
1-The scheme. The model of carrying out the connection between the disciplines of gasodynamics and small hydroelectric power plants



Thus, the technological maps created for interdisciplinary communication serve to realize the single goal of education, to define it and to organize it logically.

There is no clear mechanism for selecting topics for independent work of students, and scientific and methodological research in this area remains a key requirement in the transition to a credit-module system.Interdisciplinary research shows that it can serve as a tool to justify students' independent work topics and assignments. A number of topics or concepts of the Hydroelectric Power Stations course were taught in the Hydrogasodynamics course program.

Curricula for the stages of education are structured on a scientific basis, because only when the basics of complex natural phenomena are repeatedly repeated from simple to complex, students acquire sufficient knowledge and skills. Higher education students have the opportunity to study previously learned topics independently on the basis of new programs. Thus, the use of interdisciplinary elements of hydrogasodynamics is one of the main directions in the organization of independent work of students on the course of hydroelectric power stations.For successful training of competitive specialists it will be necessary to ensure the continuity of interdisciplinary links, to develop teaching methods for interdisciplinary subjects and to coordinate the pedagogical activities of teachers of these disciplines.Teaching methods using the above-mentioned interdisciplinary elements of pedagogical technology serve to improve the educational process and effectively achieve learning objectives.

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