PROFESSIONAL TRAINING OF FUTURE ENGINEERS ON THE BASIS OF INTEGRATION OF SPECIFIC AND GENERAL SCIENCES

Sharipov Sanjar Sobirovich
Assistant of Jizzakh Polytechnic Institute
Tel:+998977933301
sharipov_sanjar@inbox.ru

Annotation.

This article discusses the theoretical and methodological foundations of interdisciplinary integration in the preparation of future engineers. It also reveals the current issues related to the integration of the educational process, the study of its methodological foundations, the development of forms and methods, the state educational standard and the continuing education system.

Keywords: technology, lifelong learning, networking technologies, integration, existentialism, creativity, theory, methodology.

Introduction

The integration of the educational process, the organization of its methodological basis, the development of forms and methods, are topical issue selected to the state standard of education and the system of continuing education. The integration of the education system in today's new socio-economic conditions meets the requirements of market economy changes, adequate provision of material and technical and information base of the educational process, involvement of highly qualified teaching staff in the educational process, training of quality teaching and learning. One of the most important issues is to establish mutual integration between the two countries. In order to develop the stages of intersect integration in ensuring the quality of training and their employment, based on the primary social, professional needs and requirements, the ultimate goals of integration, the tasks for their implementation, methods and tools for solving them will be analyzed in detail and thoroughly. Creating a framework for cross-sectoral integration aimed at ensuring the quality of training and employment in the implementation of the stages of intersect integration; development of an integration strategy of higher education institutions that train personnel for the industry and its implementation through optimal mechanisms, methods and tools; introduction of criteria for monitoring the development trends in the labor and educational services market, the dynamics of supply and demand, the impact of structural changes in the industry on integration; revision and improvement of organizational and legal aspects of marketing activities in higher education, implementation of effective use of the opportunities of the integrated approach in the management of higher education institutions [1, 2].

Main part:

One of the most pressing issues today is the ability to identify hidden connections and associations in the formation of the scientific worldview, interdisciplinary links, that is, to ensure membership. As a result of the systematic implementation of interdisciplinary links, the relevance of the educational process will increase significantly. At the same time, it is an important condition for the development of knowledge and interest in academic subjects. Concepts, arguments, laws, judgements, conclusions that make up the curriculum through structural analysis, if through the analysis of the study material on the topics it is superficially determined which topics of different subjects are interrelated. The connection between the ideas is established. The form in which the interdisciplinary relationship its being recorded depends on the capabilities of the user.

Interdisciplinary connections should be interpreted more broadly as not only the interaction of individual subjects, but also the interaction of teachers and students, that is, as a system of all elements of the learning process. To determine the importance and place of interdisciplinary relationships in the learning process, it is necessary to classify their relationships, because a systematic approach allows to determine not only the versatility of these relationships, but also their manifestation and methods of their use (Figure 1).

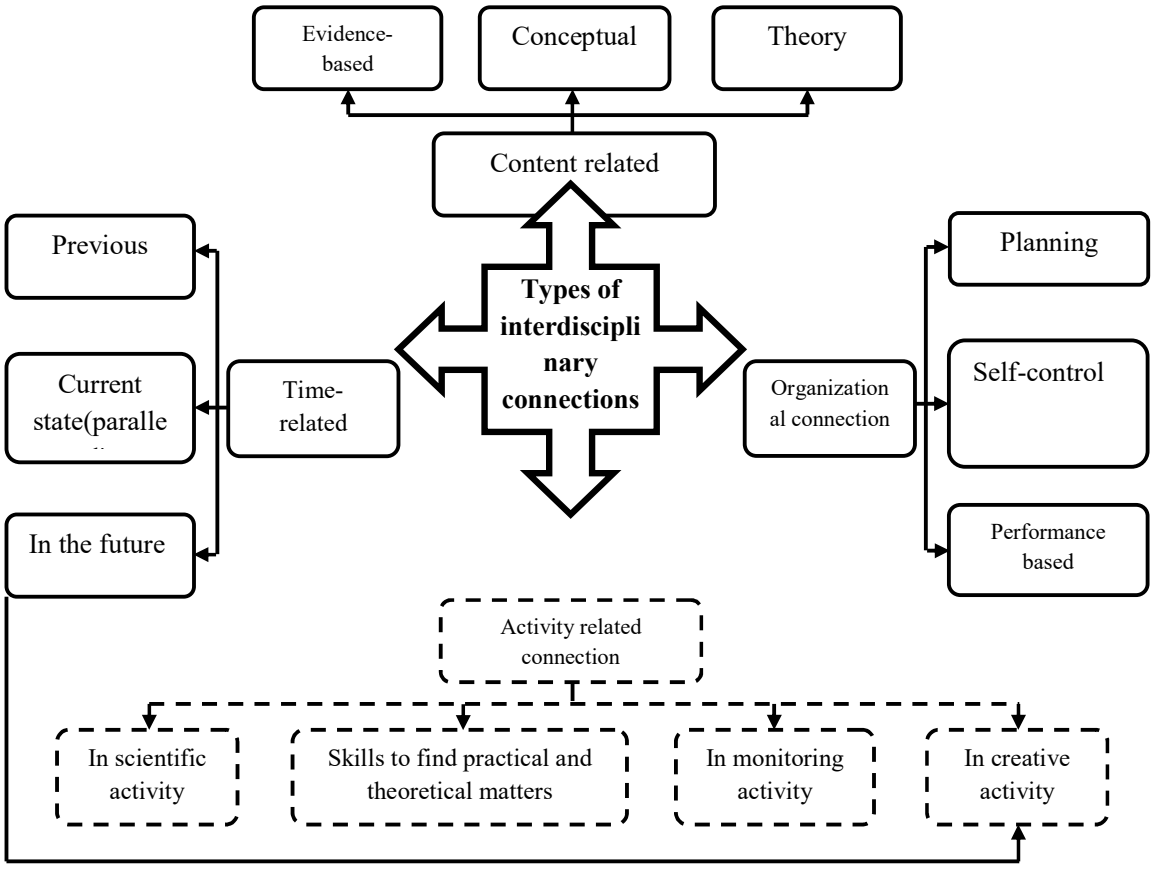

Figure 1. Description of types of interdisciplinary connections.

There are also general requirements for homework based on academic interdisciplinary links. Such independent, individual lessons should have such directions as scientific and comprehensible, to ensure the vitality of the content of education, its relevance to practice, to accelerate the cognitive activities of students. The curriculum should use a variety of forms of teaching, such as advanced pedagogical technologies, problem solving, independent work with books, exhibitions, based on interdisciplinary connections.

Ensuring its continuity is one of the key factors in modernizing the content of education. Integrity in education is the ability to correctly establish the necessary connections and relationships between its parts at different stages of the study of a particular subject. Membership means the sequence, systematic placement of educational material, reliance on previously acquired knowledge, future application of educational material, the duration of the stages of educational work. Interdisciplinary coherence in textbooks should be reflected in the coherence of teaching materials and teaching methods, coherence depends on them, but it is also relatively independent and affects the improvement of teaching materials and teaching methods.

The educational process is an integral part of the educational process, and the implementation of the integration process in this process also provides the conditions for the development of learners into well-rounded individuals who will be trained as mature professionals. However, the emergence of such conditions requires an understanding of the nature of the integration process of future engineers, who are the main subject and leader of the process, the formation of skills for their effective use in the implementation of activities. Adherence to the principle of interdisciplinary interdependence is one of the important factors in improving the quality of education. It is known that interdisciplinary connection provides a comprehensive and in-depth study of the studied topics. It is interpreted in pedagogy at the levels of membership, interdisciplinary, interdependent and integrative. Membership implies that the acquired knowledge, skills and abilities are gradually expanded, deepened and perfected.

Interdisciplinary connection is a broad concept in its essence, which means the comprehensive disclosure of various aspects and properties of the studied materials.

By the nature of the relationship, the relationship between the two subjects, that is, the application and application of the acquired knowledge and methods of action in the first subject in the second.

Integrative communication is a relatively high level of communication, which differs from the previous ones in that it is purposefully included in the curriculum and, of course, requires its provision. As a result, a structurally sound knowledge of the subject allows the formation of ways of working. In order to establish interdisciplinary connections, the content of the study material is analyzed in terms of logic, psychological, didactic, and methodological and other aspects.

Great emphasis is placed on the use of integrated learning in the learning process. The structure of integrated lessons requires the accuracy and consistency of the materials being organized at all stages of the organization, thorough organization, and logical interrelationships.

At present, the issues of design and application of electronic educational and methodical complexes are not sufficiently developed in the practice of higher pedagogical education. Electronic educational-methodical complex means a complete set of educational-methodical materials (curriculum, hypertext illustrated textbook, series of virtual laboratory works, information-database, test program, instructional-methodical materials) containing all of these; is a complex teaching tool that performs the functions of motivation, information, diagnosis, correction and supports the learning process at all stages. Two components of goal-oriented formation of professional knowledge and skills through information and communication technologies in studying in the field of vocational education in higher education institutions: a pedagogical system consisting of technology for the formation of professional and methodological knowledge and skills in learners and developmental professional diagnostics developed. During the research, a new approach to the problem of training future engineers was developed:

– ensuring the integrity of professional training in the use of information and communication technologies, while relying on the model of professional and pedagogical activity of a future engineer;

– orientation to the formation of normative-practical and creative skills of the future engineer in the context of information of education;

- realization of subject-subject relations of future engineers and learners
- attention to the individuality and creative potential of learners;
- focus on innovation processes;
- Integration and interaction of psychological, pedagogical and methodological knowledge [3].

The main task of a higher education institution that trains future engineers is to create an educational environment that is aimed at training engineers with modern, high pedagogical skills and the ability to carry out innovative activities in the interests of society. From this point of view, it is advisable to start preparing a future engineer for innovative activities from the first stage of the bachelor's degree. In particular, if the awakening of students' sense of innovation, the development of independent work begins in the early years of school, then in the 3rd stage of teaching pedagogical and psychological disciplines to direct the future engineer to innovative activities, At the 4th stage, they will need to develop the skills to independently search for news, select and implement relevant information. The use of person-centered learning technologies is important in the implementation of all these

stages. Theoretical analysis of scientific sources has shown that person-centered education allows students to develop skills such as independent learning, communication, cognition, creativity, self-development and expression (existential) [4,5].

Analysis of the historical-pedagogical, psychological-pedagogical and scientific-methodological literature on the problem of vocational guidance in the teaching of specific and general sciences in technical universities shows that improving the preparation of general sciences for the implementation of vocational education is promising. For this specialty, the description for career-oriented teaching of specific and general sciences was clarified, the didactic principles necessary for the implementation of vocational guidance were stated. Students may be able to integrate their knowledge of general and specialized disciplines and use them effectively in design work, course work and graduate work, and strengthen professional orientation in these specialties, which are the development of methodological recommendations for the study of theoretical material and practical training. In the process of teaching specific and general sciences to students of technical universities, the development of the concept of a methodological system for the formation of engineering activities in them, the main aspects of which are: the structure of the methodological system; its structural principles; integrated description of the system; requirements for forms and methods of work within the system; it is necessary to disclose the structure of the system suitable for engineering activities.

Conclusion:

As a result of the analysis of scientific and methodological work on various approaches to improving education, integration and application of science in teaching, there is a need for scientific research on the implementation of an integrative approach to improve the professional training of future engineers. Integration is the process of interconnecting the different parts of a system, a whole science, that are different from each other. The rapid development of society, which has little impact on the field of education, requires changes in the content of education, teaching methods and technologies. It is important to regularly update the content of education on the basis of an integrated approach. Today, when the volume of national information is growing rapidly due to the rapid development of science and technology, the introduction and popularization of information and communication technologies in the educational process is an urgent issue. Integration, in turn, requires the establishment of an interconnected system of education, science, technology and production.

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