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Training Technical Disciplines Using Information And Learning Environment For The Credit-Module System

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Abstract

Modular learning is the organization of the educational process in which educational information is divided into modules (complete and independent units, parts of information). A module is a block of information that includes a logically completed unit of educational material, a targeted program of action and methodological guidance that ensures the achievement of set goals. The concept of a module contains such a volume of educational material, thanks to which the primary acquisition of certain theoretical and practical skills for performing any specific work is ensured.

Keywords: Education system, informatization, credit-modular system, educational process.

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1. Introduction

In modern conditions, it is relevant to create a personnel training system that would provide professional training for highly qualified specialists capable of performing the functions of developers, researchers and managers of a wide range of scientific, technical, research and innovation projects.

The main driving force within the framework of general competition has become creative intellectual work based on scientific knowledge and modern technologies. Hence, the tasks associated with the need to improve the process of training personnel capable of solving innovative problems and possessing the skills of scientific creativity become especially acute. Recently, this problem has received increased attention, both from the state education system and from representatives of employers.

The essence of modular training is that the content of training is structured into autonomous organizational and methodological blocks - modules, the content and volume of which can vary depending on the didactic goals, profile and level differentiation of students, the desires of students to choose an individual trajectory of movement along the training course [1,2].

Modular learning is one of the most holistic and systematic approaches to the learning process, providing a highly effective technology for implementing the educational process. The essence of modular technology is that the educational process in the discipline being studied is structured into autonomous organizational and methodological blocks (modules). The content and scope of the modules, in turn, vary depending on the profile and level differentiation of educational goals. The module includes not only the goals and content of training, but also other components of the educational process necessary for organizing educational and cognitive activities (methods, means and forms of training and control). This approach makes it possible to create conditions for choosing an individual trajectory of

movement in an academic discipline [5].

Modular technology has gained great popularity in higher education institutions in the USA, Germany, England and other countries. The founders of modular learning in their works emphasize the importance of intensifying the activities of students in the pedagogical process, which indicates that modular technology is alternative to traditional learning, during which the student is presented with passive knowledge. The principles of modular technology are not opposed to general didactic ones, but represent their new facets, opening up in the light of a different organization of the educational process.

With the advent of modular training, the functions of the teacher change, because the emphasis is on the active learning activities of students. The teacher is freed from the routine work of teaching simple educational material, active control of students' knowledge is replaced by self-control. The teacher devotes more time and attention to stimulation, motivation of learning, and personal contacts during the learning process. At the same time, he must be highly competent, which allows him to give answers to those complex questions of a creative nature that students may have while working with the module.

Modular technology is significantly different from other training systems. It puts into practice the following ideas, principles and rules:

- the content of the training is presented in completed large independent blocks along with recommendations and tasks for studying the material, the complexity of which depends on the level of training of students;

- the teacher interacts individually with each student both directly - in direct contact, and indirectly - through modules;

- each student works independently most of the time, at a learning pace convenient for him;

- management of the process of educational activity of students is carried out through a program (sequence of tasks and stages of educational work) and algorithms of cognitive activity;

- assessment of the results of mastering the material is carried out according to the final control, and not as the arithmetic average of current results;

- each student is given the opportunity to realize themselves in creative activities;

The key characteristic of modular programs is their focus on the student, who in this case acts as an active subject of educational activities. This is precisely where the advantages and capabilities of modular technology manifest themselves in the implementation of the essential features of student-centered learning.

2. Methods

In the book by E.A. Sokolkova [8] puts forward the idea of integrating modular learning with problem-based learning methods. In his opinion, problem-based modular teaching technology includes five main stages:

1) creating a problematic situation;

2) discretion and formulation of the problem in the module;

3) acceptance, analysis and reproduction of the problem, determining the range of missing knowledge and ways to acquire it, putting forward hypotheses;

4) proof or refutation of hypotheses; solving a problem based on the use of existing and newly emerging knowledge;

5) selection and final formulation of a solution to the problem in a modular course, a comprehensive assessment of this solution, inclusion of acquired knowledge in the formed experience.

The purpose of introducing a credit-module system is to create flexible educational structures, both in content and in the organization of training, “guaranteeing the satisfaction of current needs and determining the vector of new interest.”

Credit-modular training is a system for organizing the educational process in a higher educational institution, based on the use of a credit system and a modular approach.

The purpose of introducing a credit system.

- first, in order to improve the quality of education, the introduction of international educational standards based on the use of international recommendations developed taking into account development trends in the field of information and communication technologies in developed countries, the provision of qualified teachers, the development of high-quality educational programs and educational materials;

- second—expansion of promising exchange programs for students, teaching staff, and research scientists with foreign universities;
- third—creating a competitive environment that allows teachers to improve their scientific and pedagogical level by mastering new educational technologies and rational forms of organizing the educational process;
- fourth—providing students with the opportunity to independently formulate their educational program and ensuring transparency of knowledge assessment. The introduction of a credit system into the educational process, which is common in many higher educational institutions of the world, will allow our educational institutions to become one of the most prestigious universities in the world [3,4].

With the help of credit systems, the problem of openness and transparency of national educational systems is solved, mutual recognition of learning results obtained in different countries and educational institutions is facilitated. The presence of a loan as an instrument that measures the labor costs of a student's education allows them to study in various educational institutions in foreign countries, freely transfer from one educational institution to another, and draw up educational plans in accordance with their professional interests. The presence of clearly developed standard instructions for teachers and students, known to them, their strict adherence helps to improve the quality of interaction between students and teachers, the objectivity of mutual control, and the predictability of grades received by the student [7]. The organization of knowledge control is determined not only by the need to ensure the quality of training, but also by the changed ratio of classroom load and independent work. Shifting the emphasis to independent work determines the need to develop a new model of educational and methodological support for the learning process and a knowledge control system.

3. Results

The use of this system when teaching special disciplines in technical universities contributes to the competent approach of students in the learning process, the ability to apply the acquired knowledge, skills and abilities in professional activities. To improve the quality when applying the credit-modular system, good organization and control on the part of the educational institution is necessary. It is also necessary to develop clear criteria for assessing and monitoring student performance, as well as ensure the availability and quality of educational materials and resources [6].

Control by the educational institution on a credit-modular basis includes the following aspects:

1. Determination of Academic Students: The institution determines the number of credits a student must earn to successfully complete the program of study. Each course or module has a certain number of credits that the student receives upon successful completion.

2. Assessment of academic performance: The educational institution establishes criteria for assessing student performance. This may include requirements for a minimum percentage of correct answers on exams, completion of assignments and projects, participation in discussions, etc.

3. Monitoring Student Progress: The institution monitors students' progress in earning credits. This may include regular progress reports, consultations with teachers and academic advisors, and online platform systems for tracking progress.

4. Providing Feedback: Teachers and academic advisors provide students with feedback on their progress and work on courses or modules. This may include discussion of exam and assignment results, recommendations for improvement and development of skills.

5. Regularly update the curriculum: The institution regularly updates the curriculum based on feedback from students and teachers. This may include changing courses, adding new modules or updating the content of existing courses.

4. Discussion

The main difficulties of introducing modular learning technologies as innovative components of modern pedagogical technologies in the process of teaching and training qualified specialists include their inherent interdisciplinary nature. Any modular teaching technology as an innovative component of modern pedagogical technologies is not an isolated area of research, but represents a family of scientific disciplines and directions that are developing and intersect with many branches of science and technology, which makes this technology a powerful tool for transforming all aspects of social life. When incorporating modular learning technology into professional educational

programs within the framework of modern pedagogical technologies, it is necessary to take into account the increasing importance of learning throughout the life of a specialist [9].

For the effective implementation of educational programs using modular teaching technology within the framework of modern pedagogical technology, it is advisable to build training on the basis of the cooperation of three fundamental concepts: communication theory, environmental theory and activity theory. It is on this basis that it is possible to develop integrated content of professional educational programs aimed at training and retraining specialists for activities related to search, transfer and management of innovations in the production, technological and scientific fields.

In order to formulate innovatively significant goals and objectives of educational programs and individual disciplines of the curriculum, theoretical research and practical work are needed in the following areas:

- analysis of the role of innovative components of modern pedagogical technology as a strategic resource and driving factor in global competition;

- analysis of the practice of using knowledge management, trends in the organization of innovation management, virtualization and transnationalization of innovative developments within the framework of modern pedagogical technology;

- research into methods for increasing the effectiveness of students' independent creative work during the learning process using modular learning technology;

Preliminary analysis and research suggest that training programs using modular teaching technology as an innovative component of modern pedagogical technology should include fundamentally new qualification characteristics that trained specialists must master, namely:

- cognitive qualities related to those specific to innovative types of intellectual activity;

- practical knowledge on the development of innovation activities;

- additional professional qualities developed in the context of training using modular teaching technology as an innovative component of modern pedagogical technology, but having a general nature and applicable in other areas and areas of production.

In contrast to the standards of traditional educational programs, it is advisable to additionally introduce the following professional qualification characteristics into the content of training specialists using modular teaching technology as an innovative component of modern pedagogical technology: skills of effective communication and teamwork; motivation and initiative; professional ethics; flexibility and adaptability; possession of modern information and computer technology, etc. It follows that the modal (average, and not minimum as in traditional standards) requirements for the level of training of specialists are supplemented by assessments of their professionalism, systematic assimilation of innovative knowledge, level of proficiency in information technology, activity in the learning process and a number of other indicators.

The conducted review analysis on the problem of modular training as a means of professional training for students at a university allows us to draw the following conclusion. Modular training is a set of pedagogical conditions that determine the selection and arrangement on a modular basis of content, forms, methods and teaching aids, ensuring comfortable subjective relationships between the teacher and students in the process of achieving an effective result in the acquisition of scientific knowledge and the formation of professional and personal qualities of future specialists.

5. Conclusion

A theoretical analysis of the literature on the problem of this study showed that the use of modular training, as one of the options for innovative technologies, is based on humanistic ideas and principles through which a person-oriented approach to the professional training of specialists is implemented.

The process of incorporating modular learning technology into existing programs should be evolutionary, but the final result may be revolutionary. The advancement of a specialist along an individual educational trajectory is a difficult evolutionary process consisting of the gradual development of certain skills necessary for his future work activity. It is associated both with the personal characteristics of a particular specialist and with the features of the practical implementation of professional training programs using modular teaching technology as an innovative component of modern pedagogical technology.

For the transition of the pedagogical system of higher

technical education to a new quality that meets the requirements of our time, further development of the theory of modular training and the resulting scientific means of cognition of forms and methods of teaching are necessary. The development of the conceptual foundations of modular training within the framework of a narrower psychological and pedagogical theory of technical education is an objective necessity of today. The creation of appropriate scientific tools will ensure the possibility of real use of the enormous potential of modular training.

Reference

1. Majidov I. U. Prospects for the development of a two-level higher education system in Uzbekistan. //Oliy ta'lim muassasalarini rivojlantirish va ta'lim sifati masalari (TEMPUS SCM TO76B06 loyihasi bo'yicha), T., 2009. – 14-18 p.14-18.
2. The Bologna process and its significance for Russia. Integration of higher education in Europe. - M. : RETTSEP, 2005. -199 p.
3. Karimov Z. Bologna process and regional universities / Z.Karimov, N. Beloborodova //Aimamater. - 2006. -№ 6. – p. 48-49.
4. Sazonov B.A. The credit system and organizational and economic aspects of the modernization of higher education/ B.A. Sazonov. -M.: SHIV O, 2005. - 95 p.
5. Krioni N.K., Selivanov S.G., SHaripov F.V. Innovation and innovative educational technologies. Uch. posobie. – M.: Editorial and Publishing House of the Russian New University, 2018. – 235 p.
6. Abdusamiyeva K.D. (2021). Research on the functioning of ethnographic vocabulary in the speech of students. Psychology and Education Journal, 58 (1), 3988-4000.
7. Sazonov B.A. The credit system and organizational and economic aspects of the modernization of higher education/ B.A. Sazonov.- M.: SHIV O, 2005. - 95 p.
8. Sokolkov E.A. Technology of problem-based and modular learning: theory and practice. M., 2012 – 56 p.
9. Conceptual provisions for advanced training of competent management personnel [Electronic resource]. URL – http:www.competencii.ru/43.html