APPLICATION OF MODULE EDUCATION TECHNOLOGY TO THE PRACTICE OF STRENGTHENING STRUCTURES

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ABSTRACT

This article outlines the role of modular teaching technology in training specialists, competitive in today's globalization and information society, developing at a fast pace of the economy as part of a competent approach to practice and theory of education.

Keywords. Modular technology, training, information society, a competent approach, technical mechanics, economics.

INTRODUCTION, LITERATURE REVIEW AND DISCUSSION

Chapter 4 of 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 No. PF-5847 dated October 8, 2019, entitled "Expected results of the Concept implementation" says that "...based on international experience, advanced standards will be introduced, including a gradual transition from theoretical education to practical skills training in the curriculum"[1].

Of course, these strategic requirements confirm the urgency of providing education with information and communication technology methodologies in these days of gradual transition from a system of education aimed primarily at the acquisition of theoretical knowledge to the formation of practical skills.

While, according to the requirements of a competency-based approach the importance of the content of knowledge, skills and experiences are bestowed for the learners, it is important to ensure that learners understand them firstly, secondly factual monitoring of their development and ensuring that they are able to fully master the requirements of educational standards requiring special attention and is one of the problems that need to be addressed in practice.

In fact, taking into account such factors as the rapid development of science and the rapid growth of scientific and technical information, the improvement of engineering structures and technological processes, the increasing level of automation in control systems, in accordance with the requirements of the period, as a result of scientific justification, the amount of workload has been reduced to a certain extent. For example, in the case of "Material Resistance", the curriculum used for a bachelor's degree is decreased from 48 hours to 18 hours in agricultural mechanization, from 48 hours to 24 hours in technological machinery and equipment, and from 37 hours to 18 hours in terrestrial transport systems. It is not secret that the workload for independent study has decreased from 80 to 54 hours in the field of terrestrial transport systems and from 103 to 65 hours in the field of technological machines and equipment.

Undoubtedly, one of the practical solutions to these problems requires educators to properly organize and implement educational processes in accordance with modern requirements, as well as to introduce them into education by ensuring the optimal combination of traditional and non-traditional models of education [2].

Therefore, there is a need to put the non-traditional education model into practice in the educational process. More precisely, the knowledge, skills, competencies and competencies that students are expected to achieve and acquire are formed on the basis of systematic laws directly through their active activities. Gradually, students begin to use the available teaching and learning materials creatively and effectively, as well as independently analyze and critically study the learning materials, and even begin to make the necessary conclusions and solutions on their own.

Educators, first of all, need the regular formation and development of students: the acquisition of knowledge, skills, competencies and competencies in accordance with the requirements of educational standards, as well as the creation of full conditions for their proper upbringing. It is also important that they become mentors, facilitators, and, where necessary, supervisors of young people's activities, as well as coordinating activities such as management and direction. In the development of modern educational processes, the role of students increases, motivation increases: positive thinking skills such as independent thinking, self-confidence, communication, problem-solving independently or collaboratively, memorization of educational materials they will be able to use them appropriately throughout their professional career life.

Given the fact that the creation and implementation of a new generation of textbooks on the basis of modular technology with a solid scientific and pedagogical basis is one of the most pressing issues, we describe the specificity of this new pedagogical technology and its role in teaching "Resistance of Materials" and "Technical Mechanics" [3, 4].

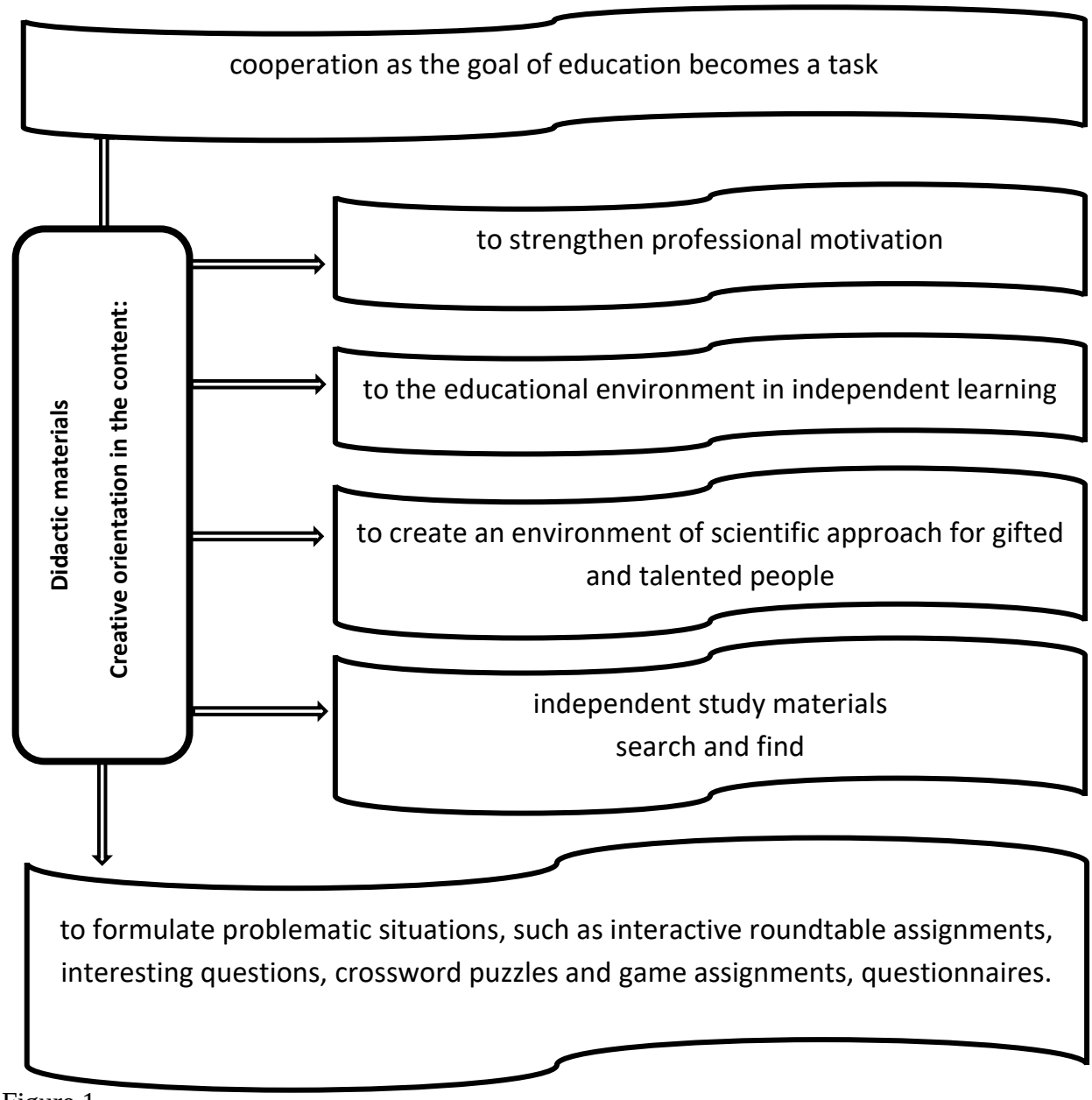

Figure 1

The advantage of modular educational technology is that it is distinguished by its content and practicality. In particular, modular technology:

• has emerged on an alternative basis in the traditional teaching process, which can integrate several accelerating and developing methods in pedagogical theory and practice;

• Integrity of theory and practice in terms of structure and content - is aimed at ensuring the integrity, as well as in solving problems of engineering practice, meets the requirements of a competency-based approach to education;

• enable a sharp change in the role of teachers and learners in the development of the educational process;

• essentially conforms to didactic principles.

We will now briefly analyze the role of didactics in modular learning technology.

Since didactics refers to the activities of both the educator and the learner, and implies the meaning of the art of teaching, the results achieved in the implementation of modular learning

technology are undoubtedly of interest to both parties. Therefore, the role of the modern educator in education is reflected in the quality of the didactic materials he creates and their practical application (figure 1).

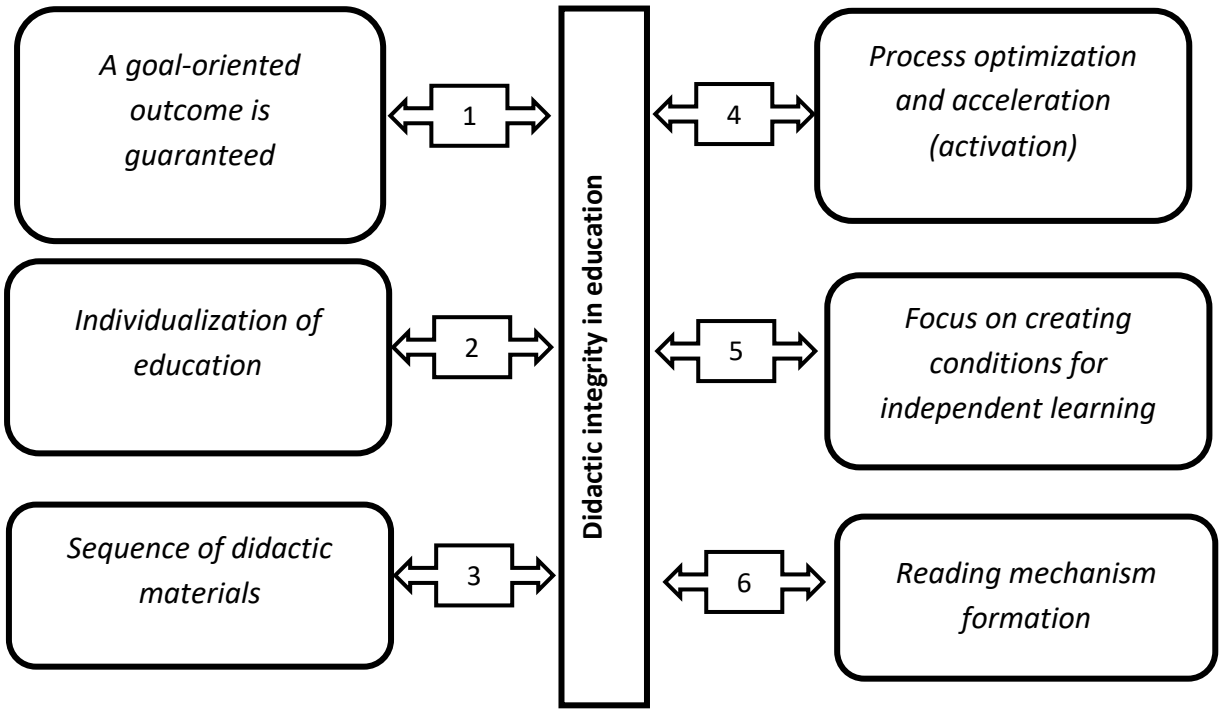

Figure 2

The authors describe the structure of each module in any subject within a single chain of didactic interdependence, taking into account the integrity of the didactic nature of modular learning technology (Figure 2).
Hence, the structural structure of each module of science:
• clearly defining the purpose of the education and show ways to achieve the guaranteed results independently (or with a certain level of support);
• individualization of education in terms of knowledge, skills and competencies;
• consistent coverage of information resources, a set of exercises related to the effective study and mastering of the content of education;
• it is characterized by the need to fully cover important aspects such as sample control questions and assignments for problem-solving roundtables, and not to rule out the use of a control rating system.

The importance of didactic design, aimed at ensuring the coherence and integration of theoretical and practical knowledge in education, is very important in the creation of textbooks based on modular technology. The didactic process defines the basis of pedagogical technology, ie its content, and represents the mechanism of transmitting the content of education to the learner over a period of time.

Of course, the design of the didactic process requires, first of all, pedagogical skills and abilities, attention, as well as the strict implementation of didactic requirements, and finally, in general, a high level of professional pedagogical and psychological competence.

The peculiarity of the didactic process is that this process begins as soon as there is an active phase of activity - motivation, which can attract the attention of students as soon as the lesson

begins, regardless of whether the forms of learning are traditional or non-traditional or individual. This stage of motivation should be considered as the key to learning - the beginning of the count.

The results of pedagogical and psychological research and observations confirm that the didactic process consists of three interrelated components: motivation, learner's learning activities, and the teacher's process management (often typical of the traditional learning model), coordination, support, and counseling.

The educator needs to know exactly the motivation criteria that are appropriate to the purpose and content of each lesson. In fact, there are many ways to increase motivation. One of them is to be able to take advantage of the convenience and advantages of the Mathcad curriculum in the context of modular learning.

For example, the use of Mathcad in solving problems of technical mechanics and materials resistance has the following advantages: first, students can solve problems very quickly with less amount of time, second, accurate and error-free results are obtained with great accuracy, and third, students' theoretical and fourthly, because of the ability to use special standard programs to construct their diagrams, students' time is not wasted on arithmetic calculations or graphs, but their time and resources are directed directly to creative, analytical-critical, and coherent approaches.

When calculating the strength and stiffness of the beams that form the basis of engineering structures, it is important to know in which sections of them the internal forces reach extreme values, in particular, the laws of change of internal forces along the length of the beam. Typically, these laws are expressed through analytical connections and the diagrams constructed using them. A graph or diagram showing the laws of change of internal forces along the beam length is called a diagram of these internal forces, or abbreviation.

Therefore, it is important to construct the diagrams correctly, because they are used to select the dangerous section of the beam and to determine the calculated values of internal forces. From this point of view, in practical computations, the knowledge of the diagrams of internal forces and stresses should be thought of as the alphabet of the resistance of materials.

An analysis of the technical literature confirms that in most textbooks and manuals on the subject of "Resistance of Materials" this module is described not as a separate chapter or module, but as "integrated" into chapters for the study of relevant deformations.

The authors have many years of teaching experience, current guidelines of teachers and academics, such as X.A.Rahmatulin and T.Sh.Shirinqulov, direct and didactic teaching methodology in compliance with the requirements of the "epithets of internal forces" labial training materials as a separate section or module, covering textbooks .

The main purposes of describing the process of epiura construction in the literature of the new generation as a separate chapter or module are:

1. To create more opportunities for students to know the content of plots and develop practical skills;
2. To create opportunities for the formation of skills and competencies to build individual diagrams for elongation (compression), torsion, bending and complex deformations

and to substantiate the correctness or incorrectness of the results obtained, strictly adhering to the plan of construction of the diagram;

3. To create conditions for students to be able to apply in practice the “Cutting method for determining internal stresses”;

4. Formation of constructive and technological skills in students (formation of the ability to apply their scientific and creative potential in practical design, creative and creative work, as well as the practical application of modern Mathcad curriculum, which does not cause psychological discomfort to young teachers and students);

5. Authoritarian teaching technologies and the ability to compare modern pedagogical technologies with person-centered education are important.

CONCLUSIONS AND SUGGESTIONS

1. Given the fact that the creation and implementation of a new generation of textbooks based on modular technology is one of the most pressing issues, the specificity of this pedagogical technology and its direct role in teaching "Resistance of Materials" and "Technical Mechanics" is scientifically based.

2. The relevance of didactic skills and scientific-practical competencies in the systematic formation and development of students' personal qualities and, ultimately, their competitiveness in society, as well as their ability to function effectively in society, in the gradual transition from theoretical education to practical skills education.

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