

ROLE AND PROSPECTIVE DIRECTIONS OF MODULAR EDUCATIONAL TECHNOLOGY IN INTEGRATED EDUCATION

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Abstract. *Integrated education is an approach based on the links between disciplines, based on the teaching of knowledge in a holistic and consistent manner. Such education increases the ability of students to apply theoretical knowledge in practice, forms the potential for critical and creative thinking. The content and significance of integrated education, as well as the associated importance of modular teaching technology are enormous. The article highlights the possibilities of enhancing interdisciplinarity and harmony between theory and practice by accelerating integrated education. The main features, advantages and possibilities of modular learning, as well as the possibilities of independent, individual and practical learning of students are outlined. The article also analyzes such promising areas as digital technologies, student-centered education, practice-oriented learning processes and an interdisciplinary approach.*

Keywords: *integration, digital technologies, e-learning platforms, competency-based education, interdisciplinary education, visualization, interactive courses, modular learning technology, personalized learning.*

- **Introduction.** Integrated education helps prepare students to gain universal knowledge and understand interrelated disciplines. At the same time, they develop important skills such as creative and critical thinking in various life situations.
- Interdisciplinary integration - helps students understand the relationship of knowledge in several areas at the same time. This provides an approach that is focused not only on theory but also on practice.
- The international concept of «modular learning» is associated with a module, which in a certain sense means a node consisting of closely related elements capable of performing a

certain activity. In this sense, it is understood as a holistic block of information, as the main educational tool of the module [1].

- A module is a logically complete unit of educational material aimed at studying one or more key concepts of an academic discipline.
- **Literature review.** The theoretical foundations of modular learning are aimed at identifying complex problems in education and their effective solution. M.T. Shamsutdinova and Sh.S. Authors such as Safarov have revealed the advantages of the modular approach in education. According to them, with modular learning, learning is individualized for each student, and he finds an opportunity to gain knowledge that matches his abilities. Modular learning technology also allows for independent work and helps students absorb knowledge more deeply and effectively through an active learning environment.
- The main theoretical principle of modular learning is that each module has its own presentation aimed at teaching students with clear directions and goals. This approach helps students acquire not only theoretical but also practical knowledge [2].
- Kasimova M.S. and Yusupova G.Kh. Particular attention is paid to the importance of interdisciplinary integration in enriching the content of education. They emphasize that interdisciplinary integration enriches the content of education, making it multifaceted and close to life. The connection between these disciplines helps students develop critical and creative thinking, since reasoning about the interrelations of each discipline strengthens the logical thinking of students. Integrated education helps students understand the boundaries between disciplines and how they need to integrate multiple disciplines and understand the connections between them to solve their most important problems [3]. The goal of this approach is to enable students to use their theoretical knowledge not only within the subject but also in solving real-life problems.
- Researchers such as Marjorie Kunst and D. Johnson have demonstrated the practical aspects of modular and integrated approaches to education and their development in the education system. In their research, they emphasize the importance of introducing online courses and free educational trajectories in education. Online courses allow students to choose different learning methods and develop their knowledge at a time convenient for them. This, in turn, helps students develop independent thinking skills and acquire the knowledge they need in everyday life.
- They also emphasized the importance of collaborative learning. Collaborative learning, that is, the development of students working together, allows them to jointly solve complex social

and interdisciplinary problems. This, in turn, helps students find new and effective solutions to societal problems. Foreign experience shows a desire to develop such educational methods and platforms that are aimed at ensuring active and independent learning of students[4].

- Analysis of scientific literature shows that promising areas of modular training are aimed at creating an independent and active learning environment for students. This allows students to deepen their knowledge within each module and develop integration between disciplines.

Modern technologies, especially digital platforms and online learning tools, help make modular learning more effective. Online education allows students to choose individual areas of study and better master the theoretical and practical aspects of each subject. This, in turn, contributes to improving the quality and effectiveness of education.

Research Methodology. To accelerate integrated education in the higher education system of KUI, it is advisable to use the following ways:

Use of technologies. The introduction of a digital platform and online learning tools allows for increasing the effectiveness of modular learning. Higher education institutions promote integration between disciplines by developing e-learning systems and interactive courses.

Individualized learning - modular learning technology provides education based on the individual needs of students. Students can learn more about the subjects that are interesting and relevant to them, and it is also possible to develop a learning pace and skills suitable for each student.

Practice-oriented integration - accelerating integration between disciplines in higher education through practical classes, laboratory work, modeling ensures that students receive knowledge close to life. For example, combining physics, mathematics, and engineering and applying them together in practical projects helps students focus on real-world problems.

Interdisciplinary education (integration between disciplines): Modular learning integrates disciplines and helps students acquire knowledge in several areas at the same time[4]. For example, studying biology and chemistry together, as well as mathematics and physics, helps students understand the interrelationships between disciplines and apply them to solve a wide range of problems.

Use of visualizations and flow charts: Complex ideas can be understood much more easily and quickly with the help of pictures, graphs, and diagrams. This helps students work with their imagination and makes it easier to focus on the learning process.

Opportunities for independent work: Allows students to gain independence in learning and problem solving. Thanks to this, they can engage in work, feel responsible, and continually expand their knowledge.

Competitive competencies and skills Integrated interdisciplinary education helps students develop competitive competencies and skills. In modern society, providing students with general knowledge in various subjects prepares them for success in new areas.

With modular learning, due to the full, abbreviated and in-depth classification of educational programs, it becomes possible to differentiate learning, that is, individualize education.

The following goals are aimed at the transition to modular learning.

- ensuring continuity of learning (between subjects and within a subject);
- individualization of education;
- creating sufficient conditions for independent assimilation of educational material;
- acceleration of learning;
- achieving effective mastery of science;

Thus, with modular learning, all the necessary conditions are created for teaching students in accordance with their abilities.

The effectiveness of training according to the modular learning system depends on the following factors:

- the level of the material and technical base of the educational institution;
- the level of qualification of the teaching staff;
- the level of preparedness of students;
- assessment of expected results;
- analysis of results and optimization of modules.

When switching to modular learning, the following is taken into account:

- Based on an in-depth analysis of the curriculum, a group of closely related disciplines is identified, that is, the entire curriculum is considered as a set of individual macromodules.

In most cases, the following three types of macromodules can be built:

A) which includes the humanities

B) including economic sciences

V) including general education, general technical, general professional and special subjects.

Macromodules are built taking into account close vertical interdependencies, but when setting the conditions for their study, it is necessary to take into account the dependencies between macromodules.

When structuring the content of educational materials according to the modular system, the main goal is to «compress» the information. It is necessary to try to present knowledge in a complete and easy-to-use form.

In the methodology of modular training, this provision is basic. It is advisable to place symbols (in the form of questions) in blocks of pictures for each module, depict questions in the form of pictures, present formulas, tables, graphs and methodological instructions.

In general, block drawings, flow charts and other visual aids can be used as handouts for students. It would be advisable to compile a glossary of terms for each subject, including modules [4]. To improve the effectiveness of modular training, it is recommended to use the following teaching methods: brainstorming, problem-solving discussion, heuristic (question-and-answer) conversation, educational business games, etc.

Analysis and results. The transition to modular training is carried out in the following sequence:

Stage I: Dividing the subjects of the curriculum into macromodules.

Stage II: Establishing the most appropriate sequence for studying subjects in a compressed training period.

Stage III: Ensuring the interrelationship of the curricula of the subjects of the macromodules.

Stage IV: Formation of subject modules.

Stage V: Development of educational and demonstration materials for the module

Stage VI: Development of a teaching technology based on the principles of modular training.

Stage VII: Create a lesson schedule taking into account the optimal number of subjects studied simultaneously.

The subject work program has been revised due to the unification of individual subjects into modules. For each module, it is necessary to formulate goals that have theoretical and practical significance.

The following materials have been prepared for each module:

- tests to monitor students' knowledge;
- assignments for independent work;

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- educational and methodological handouts;
- a list of educational and scientific literature;
- a working curriculum.

Modular training involves conducting problem-oriented and focused lectures that provide generalized information on the main issues of the subject. Lectures should be aimed at developing students' creative abilities.

When preparing the text of lectures, it is advisable to use structuring and systematization methods, present materials in the form of a block diagram, a block of drawings. In this case, the effectiveness of assimilation of the material increases, since:

- the final goal of the module is clear;
- the connections between the elements of the educational material and their transitions are clearly indicated;
- the main aspects are highlighted;
- The student is presented with the entire volume of educational material (module).

It is necessary to try to present knowledge in a complete and convenient form for use. This situation serves as the basis for creating a modular educational methodology. The following advantages of training on the content of the modular training system are manifested:

- establishing methodological compatibility of all types of the educational process within each module and between them;
- adaptability of the structural composition of the science module;
- regular and effective monitoring (after each module) of the assimilation of knowledge by students;
- immediate stratification of students by ability (after the initial modules, the teacher can recommend individual study of the subject to some students);

Thus, the training of a junior specialist using modular training is carried out on the basis of:

- continuity of education (which increases the efficiency of mastering academic subjects);
- acceleration of training (as a result, most of the information is assimilated during individual and independent work, through computer networks);
- individualization of training (the student has the opportunity to acquire knowledge in accordance with his abilities) [5].

Conclusion.



It should be noted that integrated education and modular learning technologies create great opportunities for taking the learning process to a new level and developing the creative and intellectual potential of students.

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