

The Application of Modular Teaching Technologies in Technical Higher Educational Institutions

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Abstract: The article analyzes concepts about effective methods of using modular teaching technology in technical higher education institutions.

Keywords: learning module, modular teaching system, approaches to the modular teaching system, Bloom’s taxonomy, competence, learning objectives.



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According to the Decree No. PF-5847, the gradual introduction of principles that provide for the inextricable link between the activities of education, science, innovation, and scientific research in higher education institutions is justified in regulatory documents.

In order to implement a modular approach in the process of teaching physics in technical higher educational institutions, didactic literature is analyzed, advanced work experience of foreign countries is studied. It should be noted that in pedagogical practice, modular teaching technology is based on modules and it is divided into 2 types in relation to this system:

Type 1. Accepting a course from the educational institution’s curriculum as a module and transferring it to sequential study.

In technical and technological higher education institutions, the educational process is organized on the basis of the approach, and students study 1 module of the course included in the curriculum in a certain order and for a certain period of time. After the results of the educational process are summarized, the educational process is organized according to the second module. Thus, the educational process is organized in a sequential order during the semester from the courses included in the curriculum.

This approach was applied as a test to the educational process organized in many higher educational institutions of the Republic. Since the testing process did not give the expected results, the issue of introducing this approach into practice was postponed, considering the content of the education that students acquire, their mental, physical and ergonomic capabilities.

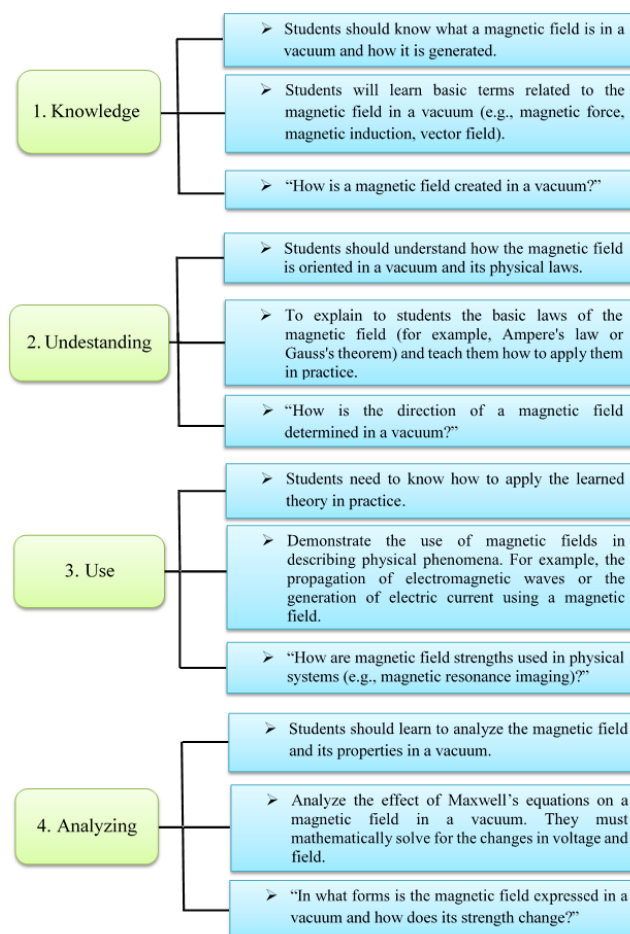
Type 2. Accepting a chapter or section of a course included in the curriculum of an educational institution as a module and teaching these courses in a modular system;

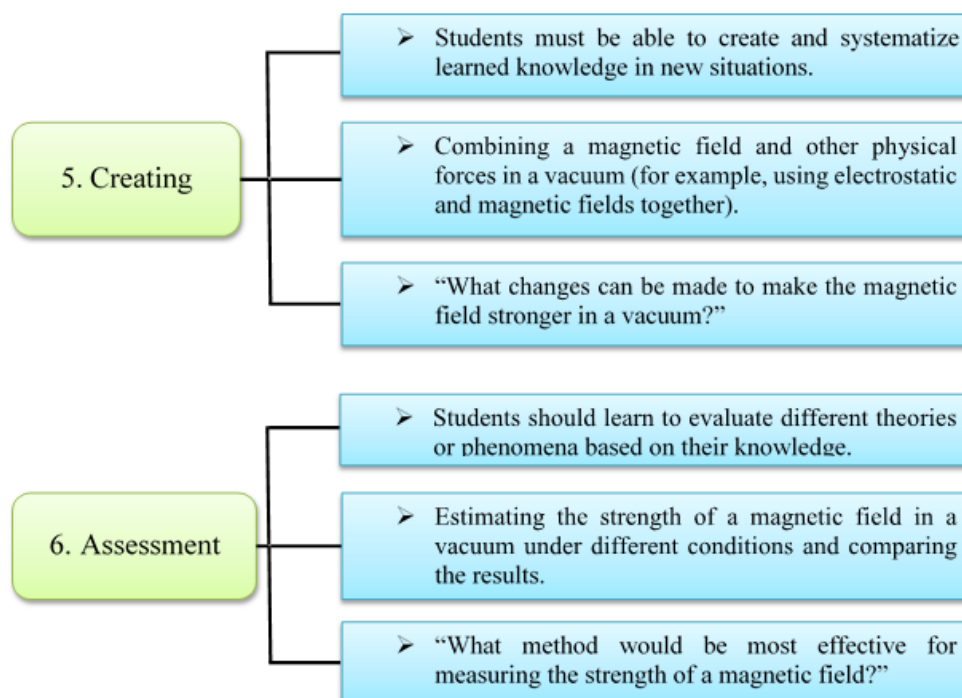
When transferring courses from the curriculum to a modular system, it is assumed that each subject is considered a separate module and each chapter in the curriculum is taught on a modular basis.

To use modular teaching technology in teaching physics, the professor must take following steps:

1. to convert the chapters Physics science training program to logically completed thinking modules;
2. To determine the knowledge, skills, and competencies that students need to acquire in this module (chapter) based on the knowledge, skills, and competencies that students need to acquire from the syllabus of physics;
3. This module (chapter) formulates learning objectives based on Bloom's taxonomy, based on the knowledge, skills, and competencies that students need to acquire;
4. To determine the learning objectives of the lectures, laboratory, practical and seminar sessions included in this module (chapter) assigned to students;
5. To determine the ways of interdisciplinary communication and the use of innovative technologies in lectures, laboratory, practical and seminar sessions in order to achieve the specified learning objectives;
6. To determine the level of mastery of the acquired knowledge, skills and qualifications by students, it is necessary to formulate current, intermediate and final control tasks by compiling non-standard training and test tasks;

Below we will consider an example of the "Magnetic Field" module in the Physics curriculum developed based on Bloom's taxonomy [2-8].





Effective approaches have been developed by foreign scientists to solve the problem of developing competencies in students of fundamental sciences, including physics, along with knowledge and skills. In conclusion, a modular approach to teaching physics creates the basis for increasing educational efficiency. In addition to having its own characteristics, technologies that allow activating students' cognitive activity and increasing the effectiveness of education, perform functions such as educational, developmental, educational, creative, communicative, logical thinking, mental activity methods formation, analysis of one's own activity, career guidance, teaching to set goals correctly, and establishing cooperation in the educational process.

The following are the advantages of using the module system in teaching physics:

1. Using the module system in teaching physics prepares the ground for activating students' cognitive activity. The determination of learning objectives in accordance with Bloom's taxonomy for each activity and their assignment to students makes them subjects of their own learning activities and prepares the ground for increasing efficiency.
2. The use of the module system in teaching physics allows students to develop not only knowledge, skills, and qualifications standardized by the State Educational Standards, but also general and specific competencies, which will allow them to train competitive personnel who meet the qualification requirements of pedagogical personnel.
3. The determination of learning objectives on the topics included in the modules and the development of appropriate control tasks will enrich the didactic provision of physics and astronomy in terms of content and create a basis for developing a science syllabus.
4. Dividing physics into modules and establishing purposeful control over it creates an opportunity to accurately assess the level of students' mastery, eliminate shortcomings in their activities, and fill and correct gaps in their knowledge [2-8].

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