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Organizing the Educational Process in Teaching Technical Sciences Based on Problem-Modular Technologies

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Abstract
This article discusses the role of problem-modular educational technology in developing the professional competence of students in vocational education institutions, as well as its structure and implementation methods. The author substantiates the reasons for using problem-modular educational technology and its potential for improving the quality of training in technological professions and specialties.
Keywords: pedagogical technologies, problem-modular technology, modularity, problem-based learning, problematic situation, problem module, modular block, general and professional competencies, quality of vocational education.

Pedagogical technologies have become an integral part of the modern educational process. Achieving educational outcomes is closely associated with the technologies employed and compliance with procedural requirements.

For teachers and industrial training masters in vocational education institutions, modern technologies make it possible to effectively solve educational, developmental, and instructional tasks, as well as to form both general and professional competencies.

At the same time, educators who approach their profession creatively do not limit themselves to existing concepts and approaches; rather, they actively develop and improve current educational and instructional technologies.

The source of genuinely effective pedagogical technologies lies in the integration of well-known technologies, namely, in the creation of "polyphonic" didactic systems. Polyphonic technologies are developed by adapting existing technologies to new conditions, analyzing their effectiveness, identifying their potential capabilities, and increasing educational efficiency.

Their advantage over "monophonic" systems lies in the application of the strengths of several time-tested technologies, thereby compensating for the shortcomings of individual educational systems.

Our approach to this technology is based on the following reasons:

1. The theory of functional systems serves as the methodological foundation of problem-modular technology. It represents a system that enables the effective resolution of educational-production and instructional tasks.

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2. A distinctive feature of problem-modular education is flexibility, namely, the ability to adapt rapidly to changing regulatory and socio-economic conditions.

The next component of problem-modular technology is modular education. According to modern pedagogical theories, modularity expresses the fundamental principle of the systems approach. Together with another principle of the systems approach — the principle of development — modularity ensures the mobility and dynamic functioning of the system.

Modular education has become widespread and is effectively implemented in vocational education institutions in developed countries. Professional modules constitute the foundation of curricula within vocational education programs designed to prepare modern specialists and skilled workers. The structure of a module integrates theoretical and practical training, including industrial internships. The content of one or several modules ensures the acquisition of a particular profession.

Our understanding of the professional module is based on autonomous units. Educational materials constructed on modular blocks are characterized by integrity, completeness, and logical consistency. Based on these blocks, professional modules are developed according to the structure and content of the academic subject. The flexibility of this technology allows modifications at different stages of education. In general, it can be noted that modularity in vocational education possesses methodological significance.

Problem-based learning constitutes the third foundation upon which problem-modular technology is built. The theory of problem-based learning has been extensively studied in both domestic and foreign scholarship. Within this approach, the educational process is organized in a special way. Instead of merely transmitting ready-made knowledge, consolidating it, and forming the ability to solve tasks, problem-based learning involves the following activities of the teacher and the learner:

Teacher's activity: presentation of facts and information, identification of contradictions → creation of a problematic situation and stimulation toward problem formulation → guidance of students' cognitive-search or subject-practical activities → acquisition of information and comprehension of contradictions → acceptance of the problematic situation (through explanation and clarification) and participation in formulating the problem → independent search or experimental-practical activity (possibly with external assistance) → substantiated proposal of solutions.

The basis of problem-based learning is the resolution of educational problems.

Student's activity: collecting information related to the task → analyzing the collected information → studying the emerging problems → preparing proposals and materials aimed at solving these problems.

According to the Russian scholar A. Matyushkin, a problematic situation is regarded as a psychological state that arises in learners when performing a task requiring the discovery or acquisition of new knowledge or methods of action. Uzbek pedagogical scholars Z.K. Karabaeva and L.V. Golish also expressed the following views regarding problem-modular educational technology:

"A problematic situation is understood as a state of intellectual difficulty in which a person cannot achieve a goal through known methods (explaining a solution, performing a task, etc.). This necessitates the search for a new mode of action."

The emergence of problematic situations is based on contradictions that are incompatible with one another. In searching for solutions to contradictions, students analyze acquired experience and information, compare opinions, and make use of inconsistencies that cannot simultaneously coexist. Positive influences on the motivation of the information-search process include novelty of information, non-standard thinking, and logical conclusions.

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Problem-based learning is a powerful method of intensifying education. In the process of resolving problematic situations, methods such as comparison, analysis, analogy, abstraction, generalization, concretization, grouping, differentiation, classification, and systematization are employed. However, there are certain limitations to the application of problem-based learning. Students cannot fully master knowledge solely through independent discovery and investigation of new laws and rules. In such cases, the teacher should act as a guide and facilitator in helping students determine solutions to problems.

In conclusion, it can be stated that in vocational education, we educators must prepare qualified specialists for society who are capable of making correct and optimal decisions within a short time and approaching their profession creatively. Therefore, I consider the broader application of the above-mentioned educational technology to be appropriate and effective.

References

1. Sh.S. Shoyimova, M.K. Khoshimova, Sh.R. Mirzaeva, M.M. Qo‘ziboeva. *Educational Technologies: Textbook.* Tashkent: “TURON-IQBOL”, 2020.
2. N.N. Azizkhodjaeva. *Pedagogical Technologies in Increasing the Effectiveness of the Educational Process: Educational-Methodological Manual.* Tashkent, 2007.
3. Ismailova, Z.K., Baybaeva, M.Kh., & Saparov, A.B. *Main Categories of Pedagogy — Development, Upbringing, Teaching, Education.* Young Scientist, 2015, No. 8(88), pp. 937–940.
4. Ishmukhamedov R. *Methodology for the Application of Interactive Methods and Pedagogical Technologies in the Educational Process.* Tashkent: RBIMM, 2008.
5. Kodzhaspirova G.M. *Pedagogy in Schemes, Tables, and Supporting Notes.* Moscow: Ayris-Press, 2006.