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METHODOLOGICAL INNOVATIONS IN MODERN VOCATIONAL EDUCATION AND THEIR ROLE IN THE LEARNING PROCESS

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Abstract
This article analyzes the theoretical and practical foundations of teaching methods for professional subjects within the modern system of technical education. It highlights the importance of methodological innovations in teaching technical disciplines, their role in the educational process, and their contribution to the development of students' engineering thinking and professional competencies.
The research is based on methodological frameworks developed by Yu.K. Babansky, E.Ya. Golant, I.T. Ogorodnikov, and other scholars, focusing on the main directions of instruction. In particular, the study substantiates the integration of verbal, visual, and practical methods in technical education, as well as the effective application of motivation and assessment techniques.
The article emphasizes that the methodological activity of teachers in technical education aims to develop students' technological thinking, foster independent inquiry, involve them in project-based learning, and enable them to solve real technical problems all of which enhance their professional training. Consequently, the methodology of teaching professional subjects in technical education is interpreted as an innovative, practice-oriented system that effectively integrates theory and practice in the learning process.

Keywords: Technical education, professional subjects, methodology, pedagogical technologies, teaching methods, engineering thinking, innovative education.

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Introduction

The modern system of technical education is rapidly evolving in accordance with the economic, technological, and innovative development demands of society. The widespread introduction of digital technologies, automated systems, robotics, energy systems, and information technologies in industry and production requires the preparation of qualified specialists who are technically minded and capable of innovation. Therefore, in teaching professional subjects in technical fields, the use of advanced pedagogical technologies, innovative methods, and practice-oriented approaches has become of great importance.

Methodological innovations in technical education represent a system of advanced pedagogical solutions aimed at improving the teaching process, enhancing students' practical and technical activity, enabling independent problem-solving in challenging situations, and developing technical thinking and professional competencies. Such approaches make the educational process more student-centered, experience-based, and supportive of creative activity.

The introduction of methodological innovations in modern technical education increases the effectiveness of the learning process, creates an environment of professional collaboration and the development of engineering thinking between teachers and students, and enables the integration of theoretical knowledge with industrial practice. Furthermore, this approach helps prepare students for independent learning, technical design, analysis, and experimental activities.

The methodology of teaching professional subjects in technical education is a scientific and methodological system aimed at developing students' deep knowledge and practical skills related to engineering, technology, and production processes. In this type of education, the main task of the methodology is not only to master theoretical knowledge but also to develop the ability to apply it in solving real technical problems and in practical production processes.Ta'limning umumiy maqsadlariga muvofiq holda texnik sohadagi kasbiy fanlarni o‘qitish metodikasi quyidagi asosiy vazifalarni o‘z oldiga qo‘yadi:

• to define the specific objectives of studying technical subjects, their place in the curriculum, and their interrelation with other disciplines;

• to develop the most effective teaching methods and organizational forms that help foster students' technical thinking, analytical reasoning, and engineering approach;

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• to develop methodological recommendations for the use of modern teaching tools such as technical equipment, laboratory instruments, computer simulators, and virtual experimental environments.

The theory and methodology of teaching professional subjects in technical fields is a modern pedagogical science that studies the scientific foundations of forming engineering competencies in the learning process. Its research subject includes the methodological model of teaching within the technical education system, technological approaches, and the innovative activities of teachers.

As a result, the methodology of teaching technical professional subjects ensures an educational process organized on the basis of cooperation between teacher and student and contributes to the training of highly qualified specialists by integrating technical thinking, creativity, and practical activity.

For students of technical disciplines, the methodological system of teaching represents an integrated educational process aimed at developing engineering thinking, enhancing practical skills, and applying innovative approaches. This system consists of five interrelated structural components: objectives, content, methods, means, and organizational forms of teaching.

In technical education, these components are closely interconnected and serve to effectively organize students' learning activities, develop their knowledge, skills, and competencies, as well as to continuously analyze and improve the quality of the educational process. The methodological system includes the stages of planning, conducting, monitoring, analyzing, and correcting the results of the educational process carried out by the teacher.

In modern technical education, the distinctive features of the methodological system of teaching are as follows:

• planning the educational process on a scientific basis and in accordance with the logic of technical processes;

• integrating theoretical knowledge with practical classes, laboratory work, and industrial practice;

• ensuring gradualness and systematicity in mastering the material, as it involves complex technical concepts and calculations;

• developing students' engineering thinking by increasing their activity in independent research, project work, and solving technical problems;

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• establishing collaborative learning through the integration of individual and group (project team) activities;
• enriching the educational process with modern technical tools such as computer programs, 3D modeling, virtual laboratories, and simulators;
• implementing a comprehensive approach by teaching various technical disciplines (for example, mechanics, electronics, automation, and materials science) on the basis of integration.

At present, in technical education, it is important to consider teaching methods as the main form of the teacher's methodological activity. This requires the teacher to possess technological thinking, apply innovative approaches, use interactive methods, and develop professional competencies in students that lead to practical results.

The term method (from the Greek "methodos" – "a way of inquiry") refers to a specific way of achieving a goal, a form of organizing activity in a certain order, that is, a set of techniques aimed at mastering theoretical knowledge and practical reality. In technical education, a method serves as the main tool for developing students' engineering thinking, understanding technological processes, and teaching them how to apply this knowledge in practice.

The content and essence of the teaching method

In the literature, there are various approaches to defining the concept of a "teaching method," but in the context of technical education, it can be explained as follows:

1.A form of interaction between the teacher and students, in which the teacher delivers knowledge, and the student applies it in practical tasks.

2.A set of working techniques that is, a collection of methods used to complete a technical assignment or study a technological process.

3.A path leading from ignorance to knowledge, where the student first understands a theoretical concept and then reinforces it through modeling, experiments, or project work.

4.A system of teacher and student activities, in which solving technical problems, creating projects, and conducting analyses are viewed as an integrated process.

According to I.Ya. Lerner's definition, a teaching method is an orderly and consistent activity of the teacher aimed at helping students acquire social and professional experience. In technical education, this is implemented, for example,

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through modeling production processes, conducting laboratory experiments, or analyzing automated systems.

The essence of teaching methods in technical education

In technical education, a method embodies not only the rules of action but also the ways of applying them in practice. Therefore, along with the term "teaching method," such concepts as "methodical technique" and "way of teaching" are also widely used. A method is a system of activities between the teacher and the student aimed at mastering technical knowledge, testing it in practice, and solving problems.

Theoretical foundations and practical application of teaching methods in technical disciplines

In the system of technical education, teaching methods serve to develop students' professional competencies, foster engineering thinking, and link theoretical knowledge with practical activity. Based on the scientific views of Yu.K. Babansky, E.Ya. Golant, I.T. Ogorodnikov, and other scholars, teaching methods in technical disciplines are analyzed in the following directions.

According to the main components of the teacher's activity (Yu.K. Babansky's system)

In teaching technical subjects, three main methodological groups of teacher activity are distinguished:

1.Methods of organizing and implementing learning activities. These methods develop students' technical thinking, analytical reasoning, and the ability to make independent decisions in problem situations. They include the following:

Verbal methods: technical lectures, analysis of engineering concepts, and explanation of complex processes through oral commentary;

Visual methods: demonstration of drawings, graphs, 3D models, and technological processes through animations;

Practical methods: laboratory work, industrial practice, and performing technical tasks;

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Reproductive and problem-based methods: applying previously learned theory in new contexts and analyzing real production problems;
Inductive and deductive methods: moving from observation of technical patterns to generalization, or conversely, applying general theory to specific technologies;
Independent and teacher-guided work: project activities, modeling, and technical analysis tasks.

Methods of motivation and stimulation in learning

In technical education, the following are considered effective ways to increase students' interest in learning:
Cognitive games and simulations: for example, virtual games related to managing a production line;
Analysis of real-life situations: case studies focused on identifying and eliminating technical malfunctions;
Creating success situations: motivating students through the successful completion of small technical tasks;
Developing responsibility: instilling principles of technical safety, work culture, and quality control.
Teaching on a scientific basis. The process of studying technical sciences should not be limited to the use of information and communication tools but must be aimed at a deep explanation of the physical, chemical, and mechanical foundations of technological processes.
Reliance on fundamental sciences. Subjects such as mathematics, physics, computer science, mechanics, and chemistry serve as the foundational base for mastering specialized disciplines in technical fields.
Integration of theory and practice. Theoretical concepts are reinforced through practical tasks, laboratory work, and industrial practice.
Gradual teaching. Instruction should be consistently directed from simple to complex concepts and from familiar technologies to new ones.
Visual and interactive approach. Technical processes should be studied not only through listening but also through observation, modeling, and analysis.
Application of knowledge in practice. Students must apply their acquired theoretical knowledge in projects, industrial internships, and in solving technical problems.

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Conclusion

The methodology of teaching professional subjects in technical fields is a systematic approach that ensures the scientific organization of the educational process, prepares students to solve real technical problems, and develops their professional thinking. Therefore, the methods and technologies used in technical education are not only means of imparting knowledge but also pedagogical mechanisms that prepare students for their future engineering careers.

References

1.Sattorov, A. Modern Pedagogical Technologies in Technical Education. *Tashkent: TDPU Publishing House, 2020. 185 p.*

2.Qodirov, B., & To'xtayev, A. Theory and Methodology of Vocational Education. *Tashkent: Science and Technology Publishing, 2019. 230 p.*

3.Hasanov, I., & Nazarova, M. Innovative Educational Technologies. *Tashkent: Innovation Publishing, 2021. 196 p.*

4.UNESCO. Engineering Education: Transforming Engineering Education for Sustainable Development. Paris: UNESCO Publishing, 2022.

5.Anderson L.W., Krathwohl D.R. A Taxonomy for Learning, Teaching and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives. New York: Longman, 2001.

6.Nurmukhamedov, A. A., Jankorazov, A. M., Khazratkulov, J. Z., & Tashmuratov, A. N. (2023). Methods of improving the frying process in the production of vegetable oils.

7. Sattorov, K. K., Hamdamov, M. B., & Tashmuradov, A. N. (2021). Selection and research of new modifications of stationary promoted nickel-copper-aluminum catalysts. ACADEMICIA: AN INTERNATIONAL MULTIDISCIPLINARY RESEARCH JOURNAL, 11(1), 438-447.

8.Tukhtamisheva, G. K., Sattarov, K. K., & Nuriddinov, B. R. (2023, June). Post-harvest processing of wheat grain. In American Institute of Physics Conference Series (Vol. 2789, No. 1, p. 030009).

9. Suvanova, F., Qobilova, N., & Tuxtamishova, G. (2023). Improvement of solvent recovery technology in oil extraction production. Science and innovation, 2(A1), 209-212.

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brightmindpublishing.com
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10. Tukhtamishev, S., Xudayberdiyev, R., & Tukhtamishova, G. (2023). MECHANIZED APPARATUS FOR CUTTING MELON FRUIT INTO ANNULAR SLICES. Science and innovation, 2(A1), 252-255.

11.Turabekova, D. (2024). ANALYSIS OF THE SPREAD OF MICROBIOLOGICAL DISEASES ON GRAPE PLANTS IN THE SYRDARYA REGION. Universal xalqaro ilmiy jurnal, 1(7), 21-27.