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THE COMBINATION OF THEORETICAL AND PRACTICAL APPROACHES IN THE DEVELOPMENT OF A METHODOLOGY FOR SOFTWARE-BASED MODIFICATION OF MECHANICAL TRANSMISSIONS WITHIN THE FRAMEWORK OF INDEPENDENT EDUCATION.

https://doi.org/10.5281/zenodo.18251852

Sh.K. Haydarova
(TKTI, senior lecturer) sh.khaydarova@tkti.uz

Abstract. *In the article, it is justified the importance of increasing the level of mastering of educational materials on the basis of PCM (programmatic-complex mastery) and the developmental education system, while ensuring the unity of KSQC (knowledge, skills, qualification and competences) in the activity of the learner, to create educational technologies in accordance with the requirements of the globalized society, where technology is flexible and changing like an avalanche.*

Keywords. *Innovative-integrative development, theoretical-practical harmony, programmatic-complex mastery, competence, motivation, mechanical transmission.*

Integrated (according to the requirements of the State Standard and the

Technology Standard, it is appropriate to call this expression programmatic-complex) mastery (IMC) of educational and knowledge materials about the object being studied in multidisciplinary conditions based on innovative-integrative and competency-based approaches (IIA) is a comprehensive and complex process, which is understood as the process of integrating knowledge, practical skills, and competencies (PSCs) obtained from various primary sources (educational-methodological and scientific sources, as well as the results of the activities of educators) in a broad sense (interdisciplinary or inter-cycle) and narrow sense (specifically within the subject, for example, mechanical transmissions in the subject of machine parts).

Therefore, when approaching the process of programmatic-complex mastering in a broad sense, textbooks and monographs can certainly be used as sources, and when approaching it in a narrow sense, textbooks, scientific articles, and even educational and methodological developments can be used as the main sources.

The conclusion from this is that the creation, publication of new generation educational literature (NGEL) and their use in educational practice require an interdisciplinary scientific and methodological complex that incorporates the IIA.

Having considered the topic, we will consider the important aspects of mechanical transmissions in the development of techniques and technologies.

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Indeed, any machine consists of three groups of mechanisms that perform various tasks and are interconnected: driving, executive and transmissions located between them, as well as nodes and details [1, 2].

Mechanical transmissions, widely used in engineering practice, are mechanisms that, when installed between the energy source and the working part of the machine, serve to connect them constructively, technologically and mechanically, to coordinate operating modes, to transmit and sometimes convert movements from one type to another, to control and coordinate movements at the required level.

In fact, from a scientific pedagogical and psychological point of view, the programmatic and comprehensive mastery of learning materials within the framework of independent education is understood as the ability of students to master certain learning materials in a dynamic sequence.

This sequence, firstly, includes understanding and understanding the formulation of a simple issue or a wide-ranging problem, noticing that the characteristics of the KSQC are being formed, gradually developing and strengthening, consistently completing tasks or tasks and achieving the required results, secondly, comparing, monitoring, analyzing and presenting the results obtained, and thirdly, programmatic mastery - the exact correspondence to the requirements of the current State Standard or Technology Standard, which embodies the teaching of theoretical and practical harmony and integrity.

Under the leadership of Professor A. Nabiev, taking into account this procedure, the main factors influencing the improvement of the system of technical general professional disciplines based on the IIA were firmly established [3].

Now, taking into account the importance of educational processes in engineering practice, we will consider the relevance of increasing the level of mastery on the basis of a developmental education syste

Education is the most complex form of human activity, primarily an activity aimed at understanding events, phenomena and processes, which serves to accelerate the individual mental development of a person and the process of assimilation of knowledge. Education is a collaborative activity, in which the educator participates on one side and the learners on the other. More precisely, the activity of the educator is manifested in the fact that, having set a clear goal and based on a plan and program, the educator's activity is aimed at instilling theoretical and practical knowledge, practical and professional skills and qualifications in the learners, or, more simply, at expressing and forming signs of competence in them, and the activity of the learners is aimed at knowing and mastering them.

The joint organization and implementation of the educational process, as well as its management or coordination, have three goals: educational, educational and developmental. Naturally, in the implementation of these dialectically interconnected,

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broad-ranging and holistic goals and their ascension to higher levels, NGEL (New Generation Educational Literature) is of great importance.

Along with the implementation of these three holistic tasks, the initial motivation begins to awaken in the person, the talent for independent work is formed. In a word, logical thinking “dominates” in a person, encouraging him to think and reason towards a specific goal. Ultimately, the signs of KSQC begin to form in the learner.

The set of priority pedagogical concepts that determine the level of integrity, content and logical completeness, completeness, comprehensiveness, and strength of the signs of the KSQC consciously and independently mastered by students in accordance with the requirements of current educational standards, as well as the abilities and potential of the students' personalities, is generally called mastery in pedagogy.

The technology of complete mastery of knowledge was developed by American psychologists J. Carroll, B. Bloom and their followers.

In the vocational and technical education system, the problem of how to implement the “mechanism or technology of mastering general and special knowledge” is considered as a process requiring special attention in engineering pedagogy. Because this mechanism consists of the following links in a dynamic sequence and coherence, directed towards a specific educational goal: the establishment of purposeful, scientifically-positive relations between students and the teacher within the framework of didactic requirements; the direct reception by students of the presented educational and educational materials - data or information, along with the “exchange” or systematic transmission of information, and the formation of a higher level of emotional familiarization; the ability to fully think about information as a process of active semantic processing by students; memorization and retention of the presented and processed information in memory; to be able to properly use this information in the initial stages of acquiring practical skills and qualifications, and in the end, in the formation of signs of personal competence that describe the degree to which a person is prepared for creative work and life.

In the era of globalization, it is not enough to have a certain worldview along with a thorough theoretical and practical knowledge of the basics of any science and the acquisition of some practical skills. Because in a modern technological society, engineering objects or phenomena-processes are rapidly improving in form and content. This shows that the ability to apply knowledge in practice is a necessary and sufficient condition. In other words, finding methods for timely perception, detection and elimination of problems, clearly determining appropriate measures, and ultimately, the practical application of knowledge, practical skills and qualifications in order to solve the problem requires high levels of skill and competence from the learner.

Now the learner needs to go beyond the standard set of knowledge, skills, abilities, to become a creative, multifaceted person with the ability and potential to make independent choices, to make independent decisions. In order to achieve such priority tasks in the

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system of higher technical education, it is extremely important to use a developmental education system. Now it is necessary to supplement the form of education or lessons with new content, and even to modernize the forms and methods of conducting lessons in accordance with the requirements of enterprises - employers in the real sectors of the economy. Both the educator, who is directly responsible for the organization and implementation of the lesson, and the "consumer of the education system" - the learner, must significantly change their approach to the requirements of the life cycle.

In particular, in a developmental education system, the teacher should not provide ready-made knowledge, but only guide the students in their search for new knowledge, coordinate the process, develop divergent thinking (different thoughts or views aimed at a specific goal) in the minds of students, as well as within the framework of independent education, as during the main lessons, and also teach students scientific methods of solving problems. Students should switch to an active form of activity: for example, discussions, round tables, intergroup dialogue, role-playing games, and become active participants in didactic games. More precisely, in accordance with the requirements of the current State Standard, Technology Standard, it is necessary for students to fully realize that in the process of mastering all engineering disciplines, it is intended to form and gradually develop the relevant knowledge, a holistic system of skills and abilities, as well as experience of independent work, as well as their personal qualities and responsibility. Usually, such a set of views organizes competences in educational processes and has a positive effect on the quality and efficiency of education.

Taking into account that educational technology is one of the main components of the integrated structure consisting of "Educator - methodological and material and technical supplies - educational process - learners" and at the same time it occupies an important place in the activity of educators and learners, based on the results of the research, the "PCM mechanism of educational materials" was created as an integrated and harmonized model of traditional and non-traditional educational technologies [3].

Also, in order to put this model into practice, the author created a logical-structural structure of the model "Methodology of program-complex acquisition of technical sciences in theoretical-practical harmony on the basis of didactic and competence approach"(Fig. 1).

Relying on the technology of full knowledge acquisition, the methodology of creating NGEL and the model of "Technical sciences in theoretical-practical harmony on the basis of didactic and competence approach" model, the author created several NGELs based on the didactic and competence approach requirements of IIA and modular education technology [2, 4, 5, 6].

Special importance is given to the PCM of educational materials on engineering objects and their design and construction in the context of multidisciplinary nature.

CONCLUSIONS

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Based on this research in the direction of “Improvement of the methodology of programmatic and comprehensive mastering of mechanical transmissions within the framework of innovative-integration and technological education” in the era of globalization:

The process of programmatic and comprehensive mastering of learning and knowledge materials on mechanical transmissions within the framework of independent education is based on a scientific pedagogical and psychological point of view;

The mechanism for implementing the “technology of mastering general and special knowledge” in the system of vocational and technical education is connected in a dynamic sequence and coherence directed towards the educational goal;

The relevance of creating NGEL within the framework of comprehensive, holistic and dialectically interconnected educational, educational and developmental goals of managing or coordinating collaborative education;

The need to implement efforts in this regard through educational reforms, considering the gradual formation and improvement of KSQC in the system of technical, vocational-technical, higher education and professional education as a complex process requiring special attention, was justified from a scientific-pedagogical and psychological point of view.

Also, the logical-structural structure of the model “Methodology of programmatic-comprehensive mastering of technical disciplines in theoretical-practical harmony based on a didactic and competency-based approach” is proposed in a new edition.

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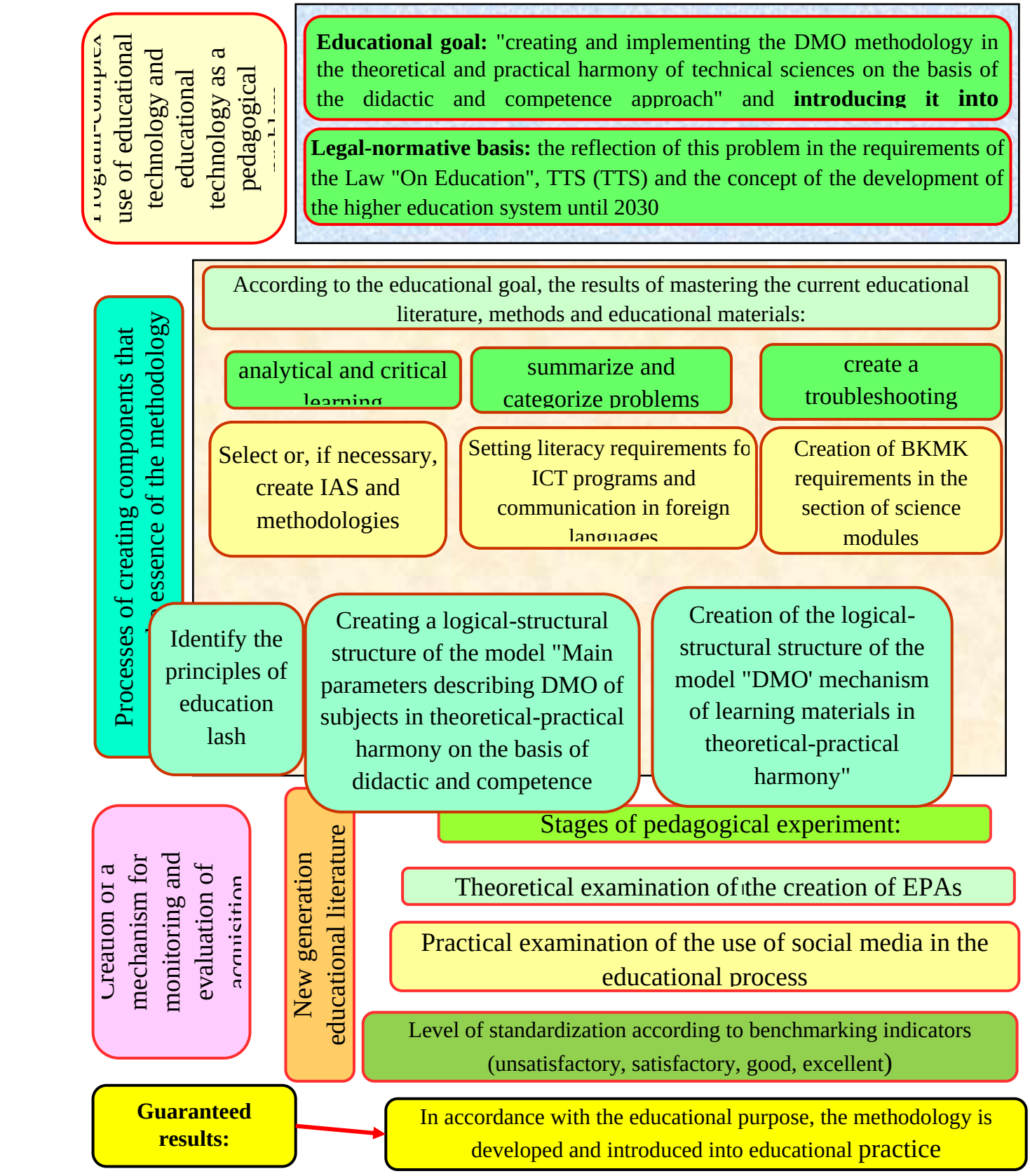

:Figure 1. Logical-structural structure of the model "Technical sciences in theoretical-practical harmony on the basis of didactic and competence approach"

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