

## MECHANISM FOR DEVELOPMENT OF PROFESSIONAL TRAINING OF FUTURE ENGINEERS-PROGRAMMERS

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**Abstract.** *In this article, the competences, mechanisms, principles, scientific foundations, practical and methodological results of the development of professional training of future engineers-programmers are discussed in detail. Sample components and practical importance of modern classroom training, differences between traditional and modern classroom training are analyzed.*

**Keywords:** *engineer-programmer, competence, mechanism, principle, individual, innovative, cluster, technology, model component, improvement.*

**Introduction:** In the development of the educational system of our republic, great attention is being paid to the training of fully mature, fully independent thinking, active and enterprising specialists. In the current conditions of rapid development of information technologies, it is important to improve the professional training of future engineers-programmers, to form personal characteristics and professional competences related to the profession. The problem of formation of mechanisms for development of professional training of future engineers-programmers in technical higher education institutions remains especially relevant in the current conditions of social development. The growth of the personal approach to the educational process arouses a deep interest in the motivational sphere of the individual, the factors, conditions and means of its formation in professional development. Recently, there is a need to study the problem of the motivational sphere of the student's personality, because re-evaluating the importance of many value directions, reconsidering one's place in society, taking responsibility for the results of life are hidden in personal motives and require not only knowledge, but also management of their formation. A student's inability to effectively apply his knowledge at the right time, inability to join a new socio-cultural situation due to low self-confidence, which leads to psychological deformation of the individual in relation to others and himself. All these are important aspects of the motivation of a person's behavior and activity, the individualization of the educational process in the socialization of students.

**Research methodology and results:** Mechanisms, principles, scientific foundations of modern student personality formation, practical-methodological results, effective introduction to practice by professors serve to increase efficiency. This leads to great changes in the personal life of students.

The practical mechanism of improving the quality of education consists of the following components:

1. System of organization of modern lessons based on individual approach.
2. Teaching strategy based on the cluster approach.
3. Individual trajectory of work with students
4. Improving the quality of education based on an individual approach to the student.

The psychological requirements of the innovation cluster for improving the professional training of future engineers-programmers are as follows:

1. Competencies of personal growth in education.
2. The concept of "lifelong education".
3. Social mobility.

The problem of improving the professional training of future engineers-programmers cannot be solved without meeting the modern requirements for training. The rapidly changing demands of the society make it necessary to adapt the lessons to these demands in educational institutions. In our opinion, modern classroom activities are directly related to the following factors:

1. Description and transition technology.
2. Developing competences.
3. Lesson process and its stages.
4. Consolidation and independent education.

The description and transition technology is one of the factors of the initial stage of the lesson, which expresses the modernity of the goal and task, the orientation of the main concepts to the developmental goal, the determination of the educational and educational importance of the teaching process, its methods and forms, and means.

*Developing competences:* algorithm, modeling, programming, design, construction, automation.

*Lesson process and its stages*

1. Organizational.
2. Reflection.
3. Statement of the subject.
4. Encouragement.

*Reinforcement and independent education*

1. Homework.
2. Independent assignments.
3. Formation of practical application skills (competence).

The following can be cited as exemplary components and practical significance of a modern lesson (Fig. 1).

**Figure 1. Exemplary components and practical importance of modern classroom training**

When comparing traditional and modern classroom activities, it became clear that these two concepts differ in the following aspects (Figure 2).

<b>Traditional lesson</b>	<b>A modern lesson</b>
organizational; requests; explanation of new material; reinforcement; homework	organizational and motivational; query-updating; goal setting; learning a new topic through interaction; primary strengthening of a new topic; interim control and assessment of student activity; corrections (correction); generalization and systematization;

	giving instructions on doing homework (individualization, differentiation, creation of options); summarizing the lesson (reflection).
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**Figure 2. Differences between traditional and modern classroom activities**

*Cluster teaching strategy.* This strategy consists of the following components:

Work on problems; classification methods, social order, integration, specialized process, open educational content.

The following issues related to the cluster can be taken as problems: professional competence, pedagogical algorithm, integration. Each of these concepts has its own necessary description and meaning in the context of learning based on cluster cooperation. This context of meaning is clarified on the basis of pedagogical analysis, synthesis, diagnosis, pedagogical council and modification methods and is important as a means of solving the problem.

The process of mutual assimilation and harmonization between objects and subjects, intellectual potential and infrastructure means an integration process based on the cluster approach. It appears in the process of ensuring compatibility of SES, curriculum, and qualification requirements in the field of education.

Within the framework of the strategy, the unified mobile information space of the cooperation of HEI and production entities, the policy of electronic cooperation aimed at improving the quality of education of these entities around the common goal, forms open educational content.

The following can be cited as conveyor activity conditions for teaching subjects in open educational content:

A goal is the setting of a projected goal with a guaranteed result.

1. Content - the content of the subject should match the profile of the student.
2. Distribution – proper distribution of process steps.
3. Harmonized methodology - selection of forms, methods and tools appropriate to the topic and its characteristics.
4. Didactic provision - to establish teaching for independent education and learning.
5. Pedagogical technique - improving the professional training of future engineers-programmers in the process.

In the teaching strategy based on the cluster approach, the cluster catalyst refers to the set of factors that influence the resolution of problems, and the cluster attributes refer to the content related to council, motivator, corrector, wise, realizer and pedagogical clinic.

**Conclusion:** On the basis of modern pedagogical technologies, students are required to apply their acquired knowledge in practice, to obtain certain results, to supplement, to enrich, to change, to have their own independent point of view. A problem-based approach is important for these mastery levels.

The mechanism for developing the professional training of future engineers-programmers in technical higher education institutions has been improved. Cluster teaching strategy, individual trajectory of work with students was developed. It was found that the determination of the personality of a modern student is directly related to the mentor-student system, distance education, independent education, mixed education, and the form and plan of individual work.

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