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MAIN CRITERIA FOR PROFESSIONAL TRAINING OF ENGINEERING STUDENTS BASED ON AN INNOVATIVE APPROACH

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Annotatsiya. *Maqolada texnika yo'nalishi oliy ta'lim muassasalari bo'lajak muhandislarining kasbiy tayyorgarligini yanada samarali bo'lishi uchun, bugungi davr talabidan kelib chiqqan holda, innovatsion yondashuvlar asosida rivojlantirish texnologiyasining asosiy mezonlari haqida so'z boradi.*

Kalit so'zlar: *Muhandislik, oliy ta'lim, innovatsion yondashuv, ta'lim sifati, metod, ishlab chiqarish, kasbiy tayyorgarlik.*

Аннотация. *В статье рассматриваются основные критерии разработки технологий на основе инновационных подходов, исходя из потребностей сегодняшнего дня, в целях повышения эффективности профессиональной подготовки будущих инженеров в высших учебных заведениях технического профиля.*

Ключевые слова: *Инженерное дело, высшее образование, инновационный подход, качество образования, метод, производство, профессиональная подготовка.*

Abstract: *The article examines the main criteria for the development of technologies based on innovative approaches, based on the needs of today, in order to improve the effectiveness of professional training of future engineers in higher education institutions with a technical profile.*

Key words: *Engineering, higher education, innovative approach, quality of education, method, production, professional training.*

Competence is one of the key skills required in the modern education system. It usually refers to the integration of knowledge, skills and attitudes necessary for effective action in a particular field. This article analyzes the

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methodological foundations of competence development and considers innovative approaches to implementing this process.

The renewal of society requires a change in the education system, a new approach and a new attitude to it. Providing quality education and upbringing to future specialists, comprehensively acquiring knowledge and skills, and facilitating their future development as highly qualified specialists in their field and mastering academic disciplines is of great importance today[1].

Scientists from the Commonwealth of Independent States (CIS) A. Aksenova, A. V. Morozov, D. V. Chernilevsky, N. Veraks, N. A. Alekseev, Yu. K. Kruglova, K. G. Krechetnikov conducted scientific research on the issues of developing the quality and effectiveness of education based on a creative approach. The factors of the formation of creative abilities in the educational process were studied by M. M. Zinovkina, A. V. Morozov, D. B. Chernilevsky, V. N. Druzhinin and other scientists, while consensual theories focused on the psychological characteristics of creativity were created by Y. A. Ponomarev, A. N. Leontiev, A. V. Morozov. The criteria of creativity, its psychological mechanisms, the development engineering of creative thinking and others studied the work of D. B. Bogoyavlenskaya, and the units of analysis of creativity were determined in the works of D. B. Bogoyavlenskaya[2]. According to the results of the ongoing analysis of scientific and methodological literature, there is a need to improve the self-development activities of specialists studying in higher education institutions based on a creative approach, and to base their effectiveness on pedagogical experience.

The research study examined innovative approaches and methods used to develop creative competence in students[3]. The methodological foundations of developing creative competence in students based on an innovative approach are the development of students' creative and cognitive abilities by updating pedagogical processes and adapting them to modern requirements. The following methodological foundations are important in this regard:

1. Diversify the educational process.

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Encourage students to think creatively in different situations by using and integrating different teaching methods:

- Interactive lessons: Strengthen communication between students, encourage joint problem solving.

- Project-based learning: Give students tasks close to real life and solve them independently or in groups.

- Problem-based learning: Teach students to analyze problems and find creative solutions to them.

2. Use of innovative technologies.

Developing creative competence by introducing modern technologies into the educational process:

- Multimedia and interactive educational materials: Using video, audio and other multimedia tools in the educational process.

- Online learning platforms: Creating opportunities for students to learn independently through various online courses and platforms.

- Simulations and virtual laboratories: Introducing students to complex processes and practical skills.

3. Kreativ muhit yaratish.

Creating a creative and innovative environment in educational institutions:

- Creative zones: Establishing creative zones and laboratories in educational institutions.

- Motivation and encouragement: Encouraging and supporting students' creative initiatives.

4. Develop a mentoring and coaching system.

The role of experienced mentors and coaches in developing creative competence:

- Mentoring system: Guidance of students by experienced professionals.

- Creative seminars and master classes: Seminars and master classes conducted by representatives of various fields.

5. Problem-oriented learning.

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Developing skills in identifying, analyzing, and finding creative solutions to problems:

- Problem-based learning: Teaching students to analyze problems and find solutions.

- Innovative evaluation of solutions: Teaching students to evaluate and improve their own solutions.

6. Cooperative and collaborative learning.

Developing teamwork and collaboration skills:

- Group projects: Implementing group projects among students.

- Collaborative problem solving: Solving complex problems together.

These methodological foundations help students develop skills in creative thinking, problem-solving, and adapting to innovative approaches.

The results of the study showed that innovative approaches are of great importance in developing competence. Interactive and cooperative teaching methods increase the activity of students and develop their teamwork skills. Project-based and problem-based learning enhances students' problem-solving abilities and encourages them to think creatively. Simulation and role-playing games play an important role in developing students' practical skills. Online and multimedia tools are effective in diversifying the educational process[4]. Competency development is an important part of the modern education system, and innovative approaches are necessary for the effective implementation of this process. Interactive and cooperative teaching, project-based and problem-based learning, simulation and role-playing games, the use of online and multimedia tools are effective methods for developing students' knowledge and skills. These approaches play an important role in forming the competencies necessary for students to be successful in real life.

The results of the study showed the following achievements in developing students' creative competence:

- Interactive lessons encouraged students to actively participate in the lesson process, which developed their creative thinking skills.

- Project-based learning taught students to work independently and in

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groups, to solve real-life problems.

- Innovative technologies diversified the learning process of students and helped them master new knowledge.

- The creative environment encouraged students to think creatively and developed their ability to develop new ideas.

- The coaching and mentoring system motivated students and helped them develop their creative skills.

- Problem-oriented learning taught students to analyze problems and find creative solutions to them.

- Cooperative and collaborative learning encouraged students to work in teams and develop creative solutions in collaboration.

Research results have shown that diversifying the educational process based on an innovative approach and creating a creative environment play an important role in developing students' creative competence[5]. Interactive and project-based learning methods teach students to solve real-life problems, while innovative technologies allow them to quickly and effectively master new knowledge.

The coaching and mentoring system is of great importance in motivating students and developing their creative abilities. Problem-based learning teaches students analytical thinking and creative approaches. Cooperative and collaborative learning methods help students develop teamwork skills.

Innovation – (English) means innovation, newness, while technology is derived from the Greek words “technos” – art, skill and “logos” – science, and innovative technology means a new approach to educational forms, methods and techniques. Innovative technologies are innovations and changes in the pedagogical process and the activities of teachers and students.

When using innovative technologies, the teacher is required to have the following knowledge:

- Knowledge, skills and qualifications in ICT;

- Being aware of foreign experiences in new pedagogical technologies (PISA, TIMSS);

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- Skills in using didactic games and interactive methods in organizing the educational process;

- Mastering knowledge of advanced pedagogical technologies;

- Having developed the technology for transforming knowledge into skills and qualifications;

- Being able to effectively use mobile games in the lesson process;

- Being able to connect the lesson to the Internet, if possible;

- Constantly working on oneself, following news in each field, etc.

When organizing a lesson based on innovative technologies, the teacher can use various technical means (computer, projector, electronic board, etc.). The more innovations there are in the teacher's work, the more content it will increase. It should also be recognized that the ideas about innovative technologies and interactive methods in education do not have a stable and perfect form. Each teacher can introduce innovation into education individually. Innovative technologies arise from the teacher's dissatisfaction with his own work [6]. “Innovation of activity is carried out in 3 stages, namely, preparation, planning and implementation.” – said the famous teacher A. Nikolskaya. The main goal of innovative technologies is to achieve a commonality between the teacher and the student, to interest students in science, to change their attitude to education, to acquire the skills to apply the acquired knowledge in social situations, to combine ICT and didactic materials with the subject, etc. With this article on the use of interactive methods in organizing lessons, every subject teacher has the opportunity to use the methods and games used to effectively organize lessons in the lesson process. If a teacher is a researcher, a creative subject who thoroughly knows the subject and through this subject provides knowledge to students based on innovative ideas based on the needs of today, this will cause that teacher to gain the attention of students and parents. Based on the ideas mentioned above, by instilling a lot of information in all lessons, it is possible to increase their interest in learning and the profession. For this, it is necessary to integrate and instill more concepts about modern engineering and technology in science in students[7]. The more skilled the teacher is, the more proud he will be of

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his students' achievements in the future. In short, innovative technology is the provision of new knowledge to students through scientific research, development, experimentation, or other scientific and engineering achievements.

Table 1

Criteria for developing professional training of engineering students based on innovative approaches

№	Types of professional training	Content
1	Scientific and theoretical preparation	The ability to organize effective interaction with the audience during the lesson, establish positive relationships with young people, and create a healthy spiritual environment.
2	Scientific and methodological preparation	To be able to convey all their knowledge to young people in an understandable, fluent language, and to effectively use educational technology and methods.
3	Training in the specialty	The ability to acquire in-depth and comprehensive knowledge in their field of study and subject, and the ability to work on themselves
4	Having the ability to know	A teacher with such abilities knows the subject not only within the scope of the course, but also much more broadly and deeply, constantly follows discoveries in his field of study, knows the material perfectly, is extremely interested in it, and also conducts scientific research.
5	Having the ability to explain	Be able to explain the educational material in a way that is understandable to future engineering graduates, and be able to arouse interest in independent and correct thinking in future engineering graduates.

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6	Having the ability to observe	Psychological observation, which is related to the student's ability to understand the future teacher and his or her temporary mental states. Such a teacher can detect even subtle changes in the future teacher's psyche based on small signs and minor external signs.
7	Possessing pedagogical speaking skills	It is the ability to express one's thoughts and feelings clearly and distinctly through speech and gestures.
8	Having organizational skills	The future engineering major involves organizing, uniting, and motivating a team of graduates to solve important tasks, and secondly, organizing one's own work. Organizing one's own work means being able to plan and control work properly.
9	Possesses methodological competence	Future engineering graduates have the ability to effectively apply professional methodological knowledge, skills, qualifications, and experience in practice.
10	Having methodological competence	Future engineering graduates should have the ability to effectively apply professional methodological knowledge, skills, competencies, and abilities in practice, and have a deep understanding of the essence of scientific progress and the basic teachings related to its development.

The concept of competence comes from the Latin word "competentia", which in the explanatory dictionary means "legally entitled", "entitled", and is close to the concepts of "ability", "skill", "talent" widely used in general use. The term competent means ... someone who has a certain type of competence, is capable, knows his field, and is able to convey it to others.

Within the framework of vocationally-oriented teaching technology, ready-made knowledge exists alongside knowledge that is "born" and synthesized as a

result of the student's own creation and implementation of a subject-specific project.

In organizing education for future engineering graduates at universities based on a modular approach, learning objectives, educational content, and management of learning activities are analyzed from the perspective of some didactic categories.

The main tasks of economic development are: full use of existing potential; increasing the national production volume; creating new jobs and reducing unemployment; increasing incomes and the level of social well-being; increasing the profitability of local enterprises; increasing the level of competitiveness of individual enterprises and the national economy; expanding the tax base, increasing budget revenues and expanding the financial capabilities of the state; creating favorable economic conditions for ensuring social stability, expanding international relations and gradually integrating into the global community; expanding the economic and political influence of members of society. Although this growth is difficult to achieve and is characterized by high costs, it has a number of advantages. This type of growth stimulates scientific and technological progress, increases labor productivity and production efficiency, and makes it possible to solve the problem of limited resources.

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