

Improving the efficiency of outstripping training of engineers in interaction with ECTNA conditions.

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The construction of national innovation economy integrated into the global community determines the vector of development of innovative industries with breakthrough value.

Petrochemical complex is the most promising [1] revenue generating sector of the economy Russia. Trends in the development of oil and gas complex determine the focus of outstripping professional training, including fundamentalisation with elements of versatility, complexity, variability, international focus, time optimization of the training on the basis of the cluster approach in the organisation of the educational process.

One of the most promising forms of organisation of innovative educational process of preparing engineers for petrochemical complex stands project-activity training.

The basic idea of the project-activity education is a graduate who has mastered the knowledge and ways of activity. In this case a student turns from passive consumer of knowledge to active subject of educational activities. Because in its future career a specialist will always face, adapt, participate and implement various types of innovations and focus on the individual work with independent decision making.

The project-active education is aimed at the following objectives: to form a specialist as a member of society; training of highly qualified personnel; continuing professional readiness, motivation for self-development and progress on the career ladder.

The essence of project-activity education of future engineers for the petrochemical complex is to train engineers required for enterprises to solve specific problems. A high level of professional training helps to enter the production activity in the enterprise without the adaptation period.

Designing project-active training of engineers for petrochemical plants was based on such principles as systematic, continuity, integration, interdisciplinary connections, correspondence and regionality.

The mechanism for implementing the project-activity training of engineers includes several parts:

- 1) Forming project teams from students in association with companies;
- 2) Development of individual training plans;
- 3) Educational planning of the project-activity training considering a workload of students in the basic educational program;

- 4) Development of institutional mechanisms of interaction between the university and the enterprises to implement the project-activity training;
- 5) Matching the content of training with companies:
 - a) identifying subjects and organization forms of scientific research and development work carried out by students;
 - b) content definition and control of all types of industrial practice by representatives of enterprises;
 - c) attracting leading engineering personnel in the educational process;
 - d) formation criteria of quality of professional training of engineers.
- 6) Employment of graduates.

The educational process is built based on the level of education and training of students from course to course. It's a dynamic system opened for change, transformation and continuous interaction of structural components with each other. Patterns and trends in the development of enterprises were taken into account when planning the content of the project-activity training of engineers. Changes in the technical and social progress, new technologies, production impact on the content and structure of professional activity. Therefore, the leading rule in determining the selection of the content of the project-activity training of engineers is to focus on current and foreseeable needs of the individual, businesses, industry, region and society in general [2].

The effectiveness of the implementation of innovative educational process is determined by the creation of conditions such as the integration of education, science and industry, developing of the content of the training, the organisation of the educational process, psychological and educational readiness of students, teacher's competence, availability of appropriate material and technical base in vocational education and etc.

Improving the performance of outstripping training ensures the process of internationalisation of education. Its beneficial effect is obvious: it is increasing the number of participants in the educational process by bringing relevant subjects of the international community and pooling their resources to improve the innovativeness of the organisation, content and material-technical base of educational process; universalisation of knowledge; expansion and strengthening of international cooperation with universities in a single line, scientific and professional societies and industries, that deepens the knowledge base of institutions and participants in the educational process and expands the scope of scientific researches, enriches the educational programs.

An example of a positive impact on the process of outstripping professional training for the oil and gas complex is the result of international cooperation of the federal state educational institution of higher professional education "Kazan National Research Technological University" and "European Chemistry Thematic Network Association" (ECTNA) which allows enriching of the educational process by the strengths that the integrable subject has.

The activities of ECTNA focuses on four areas: creating conditions for a quality education, organization and development of distance education,

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intensification of training and increasing the attractiveness of chemical education in the community. To do this following tools are used:

- a virtual community on Chemical Education, which provides vocational and higher education institutions students, , as well as scientists and engineers, the opportunity to cooperate;
- European quality marks in chemistry: Eurobachelor, Euromaster and Chemistry Doctorate Eurolabel, which is awarded for the development and implementation of basic education programs in chemistry or interdisciplinary programs, As well as for research in chemistry and related sciences;
- intensive scientific school on chemistry for researchers, teachers and students, which are the means of transfer of modern specialized knowledge and skills, enhance multinational cooperation and intercultural communication at the undergraduate and teaching level, the development of specific to the subject area language skills.

The implementation of these mechanisms in the educational process will ensure: increasing the motivation of students to higher levels of competence; institutional partnerships; the creation of strategic educational alliances; mobility of educational programs and institutional mobility; increased academic and professional mobility of students, teachers and professionals; integration into the curriculum and the international dimension of educational standards; the formation of a team of engineers-professionals with international certifications to employers.

Internationalization as an objective process of sustainable interaction and mutual influence of national systems of higher education contributes to the development of international integration of universities. This allows you as a promising areas of international cooperation, to improve the quality of outstripping training to consider:

- development of individual mobility of the teaching staff, students, graduates;
- the formation of an integrated system of foreign training of scientists and teachers;
- realization of joint international scientific researches;
- the creation of strategic educational alliances;
- integration into the global programs of the European educational space;
- the establishment of international educational programs with the issuance of double diplomas;
- marketing and promotion of research projects and educational programs.

References

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