

Perspectives of Engineering Education for Industrial and Innovational Development of Kazakhstan Republic

KAZAKH NATIONAL TECHNICAL UNIVERSITY NAMED AFTER
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Over the past years the economy of Kazakhstan Republic was characterized by the sustainable growth, but in order to save this dynamics it is necessary to implement new model of development which is based on high technology application, growth of brain capital and innovation distribution. For high quality economic prosperity it is essential to create actual innovational, educational, scientific and technological infrastructure which provides reproduction of brain capital, generating of new knowledge and innovation, its capitalization, reforming to new products, services and technologies, development and market consumption.

Industrial and innovational strategy of Kazakhstan Republic development requires higher educational establishments of new generation, innovational research universities of international rank which will be the centers of accumulation and maximum effective application of educational and scientific potential. They

will be ready to make a breakthrough in the development of basic economic branches of the country. Kazakh National Technical University named after K.I Satpaev (KazNTU) can become one of these centers.

The establishment of such research university can contribute to the quality increase of engineering professional specialist training for innovational economy in basic spheres of modern science and technology, entrepreneurship in high technological field.

While transferring high educational establishment into Research University, several top-priority goals are defined. These goals imply the development of progressive technical educational programmes and modern educational technologies which include:

- development and implementation of modern educational programmes, including foreign language programmes, educational programmes considering

The article reveals the latest methods of professional specialist training system development in terms of national and international educational need, problems of training quality management, questions of university priority orientations development.

the priority areas of science and technology (nanotechnology, new material technology, informational and telecommunicational technologies, energy saving technologies, technologies of rational land management and etc), as well as modernization of existing learning environment and technologies of high school education in accordance with world best practice;

- implementation of such new educational technologies as: electronic university, electronic environment including for instance electronic educational port; new technologies in professional education through the application of modern information technologies;
- introduction of common international BA, MSc and PhD programmes with leading international universities in terms of experience sharing and internationalization development.

In order to turn this idea into reality, university has programmes of bi-diploma education together with different universities of the world. Besides, a joint Kazakh-Korean centre of informational and communicational technologies created by South Korean organization KOICA was opened in KazNTU in 2009. This center aimed to broaden the potential of international programme training and to provide the socio-professional recognition of educational training programmes through national and international accreditation.

Through several years KazNTU maintains an active cooperation with partner universities possessing great experience in educational programme accreditation and with international accreditation agencies on assessment of engineering educational programmes such as American Accreditation Agency ABET (USA) and Association of Russian Engineering Education.

Accreditation, being a wide-spread method of teaching quality assessment, is considered in many countries to be the

acknowledgement of quality development and maintenance that means the presence of efficient education system which provides steady development.

Universities of Europe, the USA and other countries consider accreditation to be the main external assessment which gives the educational establishment an authority for realization of educational programmes. Thereafter, the result of such assessment will influence the quality of professional specialist training and university status; it will make university more competitive in the educational market in any types of ranging; it will contribute to the development of main interaction methods with employers and establishment of joint industrial committees.

At present KazNTU is creating industrial-consulting council involving industry and university representatives for the improving of professional engineering specialist model and integrating forces for growing high-qualified and skilled postgraduates:

- development of new educational standards in the sphere of high technologies and rendering of educational service for the industry where universities should provide training and retraining in different industrial spheres based on the life-long learning principal, for instance, programmes for adults training, continuing professional training for industry representatives, etc;
- further development of material and technical specialty basis, science-educational interdepartment laboratories on scientific priorities through the creation of special collegial authorities which analyze, study the development, relevance and specialty perspective;
- large-scale analysis of world leading technological universities experience in development of professional competence, i.e. relevant professional knowledge and skills of their postgraduates, development of educational programmes

and system of quality indexes allowing to provide postgraduates with necessary level of training in accordance with the high forecast of technological industry development.

Based on the obtained results and international standard requirements, there is the necessity of the development of competence matrix and improvement of professional engineering specialist model.

At further transformation of high educational establishment into research university, it is necessary to develop the system of service advancement in the sphere of engineering, projecting, science-research and test-constructing works. It is essential to create engineering centers, to develop technology transfer centers which will further become modern management service of intellectual property. Based on modern science achievements and technological facility, joint informational and digital resources, there is an opportunity to develop center and laboratory infrastructure as well as to conduct modernization of existing facilities in order to provide high quality of experimental work.

One of these institutional structures is national science shared laboratory of information and space technologies. KazNTU is equipped with the most powerful in the republic supercomputer.

It is possible to develop infrastructure within the proposed programme to support the university and students innovations of university specialists and students.

Besides it is planned to create integral system of technological internship for MSc and PhDs by integrating of new practicum which fully imitates the real working conditions. For this purpose the university has created Technological Business Incubator.

It is necessary to introduce the programmes aimed at the attraction of young scientists and professional specialists for science-pedagogical work, as well as to train staff and create new

scientific schools with international approval.

The establishment of research university will help to improve the technology development in a number of technical and technological spheres.

Research and technology associations will become a tool for providing university's input into the basic republic economical sphere development as they can unite the forces of the state, industry and science for the purpose of rapid development in definite technological areas.

The results will be:

- modernization of educational establishment activity, providing integration of education, science and industry and also training of highly qualified professional engineering specialists for technological areas entering the sphere of national interests;
- establishment of university which will correspond with the best international models and will be competitive at international educational market through the collaboration development with universities of Europe, Asia and America in frames of international education and science programmes, distribution of Kazakh educational technologies and standards round the world. It will improve the image of Kazakh Republic like an international science-educational country;
- convergence of university researches and fundamental academic science, and qualitative combination of knowledge in the sphere of modern technology, discovering of new research priorities necessary for industrial-innovational country economy development;
- the development of science work commercialization mechanisms and improvement of scientific innovational potential;
- control and development of scientifically based system intended for consideration of economy needs in

- professional specialists, which will result in supplying the labor market with mostly required professional specialists aiming to satisfy personal, state and industrial interests and will contribute to stable national economy growth, intellectual and technical leadership of Kazakhstan Republic in 21st century;
- emerging of new ways of business and economy development, as well as large innovational projects and new vacancies in high technology sphere, extracting and refining of natural resources, particularly on the basis of research consortium mechanism realization, infrastructure development for technology promotion and commercialization, and also development of different innovation-active companies, cooperating with university.

High rate of Kazakhstan development – the country which is being developed under the conditions of market economy - puts new objectives for country educational establishments. The role of modern educational system which is an important factor of country economic development becomes significant.

Contemporary social relations and changing of labor markets require adequate reaction to nowadays educational

challenges and economic development requirements correspondence.

In his message to Kazakh people, the president of Kazakhstan N. Nazarbaev, formulated a state strategic education development task, which should provide contemporary level of education, training of professional specialists most-searched in any labor market of the world and providing of international standard quality educational service. Also, new country development priorities were defined. The question of educational establishment certification at the level of international standards was specially highlighted because it can truly evaluate the quality of each university education. The president also specified the objective for technical universities in new generation professional technical specialists training, with contemporary set of mind and modern labor market requirements correspondence.

At present, the quality of education system is of a great concern for all educational establishments and especially universities.

To implement new technologies and create quality insurance system, it is necessary first of all to develop the “culture of quality” that means an active collaboration of all specialists, critical self-judgment and specialists’ responsibility.

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