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History of formation and development of the Karaganda State Technical University

The article deals with the history of formation and development of the Karaganda State Technical University, the opening of which is associated with the development of the productive forces of Kazakhstan in the post-war fifties, as well as increased demand for coal and other mineral resources in connection with the construction of the giants of black and nonferrous metallurgy and the discovery of promising new deposits of iron, copper and other ores in the Central-Kazakhstan region. The purpose of this scientific article was to study the history of the formation and development of the Karaganda State Technical University on the basis of archival documents. The objectives of the presented scientific work is to study the state of the educational and material base of the Karaganda Mining Institute, scientific and pedagogical and educational work carried out in the team, as well as the creation of new departments, laboratories, selection and placement of teachers, scientists. The number of students and teaching staff of the Institute is tracked. Special attention is paid to the Hero of Socialist Labor, twice laureate of the State Prize of the Kazakh SSR, academician of MSE RK Abylkasym Saginovich Saginov, who stood at the origins of the Institute and was a rector of the more than thirty years. A.S. Saginov made a significant contribution to the development of the mining industries of Kazakhstan, as well as to the training of highly qualified specialists. The relevance of the study is due to the complex tasks of modernization of the system of higher technical education in modern Kazakhstan. Modernization of technical education, being one of the progressive ideas of the pedagogical picture of the world, is activated in national education, as a rule, at the turn of the century, when the tense present becomes the boundary between the traditional «past» and the emerging «new». Consequently, in the period of modernization in education, there is an awareness of the need for methodological changes, the search for new teaching methods, the expansion of the social base and the creation of higher level educational institutions. These processes of «boundary pedagogy» can be traced in the projects of modern educational reforms on the example of the Karaganda State Technical University.

Keywords: higher technical school, the Karaganda State Technical University, students, teaching staff, highly qualified engineers, Central Kazakhstan region, Kazakhstan.

System of higher education in Kazakhstan takes a special place in decision of diversification of the state economy. Over last ten years, Kazakhstan has reached a significant progress. Herewith, the highest technical school has always been the subject of the special attention, because its development related to problems of economic, science-technical and social progress. It had been handling with them worthily, but directions of its strategic development, priorities and goals had radical changed in post-Soviet period. Much had been done in theory and practice of education system reformation in last years. At the same time, many universities continue working, using established activities' directions through decades, but others act, reacting at formed inquiry from the side of the labor market, and adapt to the rapidly changing conditions and realities of life. This testifies to the multidirectional development of branches of the economy and higher education, especially technical universities. One of the largest technical universities of Kazakhstan is the Karaganda State Technical University (KSTU), development of which has been carrying out in accordance with the needs of the economy of the republic. KSTU has a glorious history and wonderful traditions: in 1953, the USSR Council of Ministers had passed a resolution on further expanding and improving the training of engineers for mining specialties and the opening of mining institutes in Karaganda, Perm and Tula. Based on this resolution, and in fulfillment of orders of the Ministry of Culture of the USSR of July 9, 1953, No. 1223 and July 18, 1953, No. 1274, the Karaganda Mining Institute had been organized. Candidate of Technical Sciences, Associate Professor of the Moscow Mining Institute Y.K. Nurmukhamedov is a prominent specialist in the field of mineral resource development systems had been invited to the director's position. Y.K. Nurmukhamedov was one of the first Kazakh mining engineers, who had graduated the Dnepropetrovsk Mining Institute in 1934. Doctor of Technical Sciences G.E. Ivanchenko, who headed the Karaganda mining technical school for many years, had been appointed as his first deputy. In the first year of study, the institute accepted 224 students in the specialties «Development of mineral deposits» and «Mining electromechanics» [1; 2, 12].

The opening of the mining institute was a major event not only for Karaganda, but also for the whole of Kazakhstan. The local authorities paid special attention to the young higher education institution: temporary premises were allocated for studies, and students were accommodated in the dormitories of the higher educational institutions and technical schools of the city. In a speech about the opening of the university, the first director of the institute, D.K. Nurmukhamedov, noticed: «Karaganda is the third all-union coal stoker. Domestic technologies are equipped with advanced domestic technology. Continuously improving methods for the development of coal deposits. Qualified personnel — commanders of the coal front. This forge of engineering personnel should be the Karaganda Mining Institute» [2].

The next milestone in the history of the Karaganda Mining Institute was the 1953–1954 academic year, when basic departments for the development of mineral deposits and geology, geodesy and surveying, higher mathematics and theoretical mechanics, descriptive geometry, graphics and metal technology, chemistry and physics, foreign languages, physical education and sports, Marxism-Leninism, military training had been done. In 1955, the candidate of technical sciences, Abylkas Saginovich Saginov, who had previously headed the Karaganda Coal Research Institute, headed the institute. At his request, a professor from the Sverdlovsk Mining Institute, doctor of technical sciences M.L. Rudakov, a major specialist in the field of surveying, had been sent to work at the institute. The staffing of the mining institute with scientific and pedagogical personnel initially went with great difficulties. In the first year, the faculty consisted of only 30 people, including eight candidates of science. The first teachers were M.A. Ermekov, Sh.U. Kan, P.I. Kiryukhin, L.L. Timokhina, B.G. Khristenko, S.G. Degtyarev, A. Ishmukhamedov, G.I. Moiseev, L.G. Caitlin, V.N. Brinza, N.Y. Snitovsky, F.S. Markov, A.P. Lee, S.L. Serov, N.E. Gurin, R.A. Tsareva, I.P. Rybakov, N.E. Sokolov, E.P. Keller, A.E. Yakovlev, A.G. Zdravomyslov, T.E. Gumenyuk, I.A. Trufanov, B.I. Khalepsky, M.P. Tonkonogov, N.F. Bobrov, A.B. Akimov. In subsequent years, highly qualified specialists from other universities of the country, experienced production workers and young people who graduated the graduate school replenished the teaching staff.

It is necessary to especially note the fruitful work and invaluable contribution to the successful formation and development of the Karaganda Polytechnic Institute of Hero of Socialist Labor, academician of the National Academy of Sciences of RK, twice winner of the State Prize of the Kazakh SSR, doctor of technical sciences, professor Abylkas Saginovich Saginov (1915–2006). In this position, his organizational talent and outstanding scientific abilities were clearly revealed. Having headed the institute, the teaching staff of which consisted of twenty eight people, among whom there were only six candidates of sciences, A.S. Saginov came to the conclusion that the successful development of the institute will depend on two main factors — the state of the teaching and material base and the scientific and pedagogical qualifications of teachers. A.S. Saginov achieved backfill and accelerated construction of a large educational laboratory building, now the main building of the institute. Soon began the construction of a number of other educational buildings, dormitories, canteen, etc. The development of the educational and material base allowed the institute to increase the admission of applicants for the first year from 224 people to 2500, the faculties of evening and correspondence courses were opened [3; 46]. This allowed bringing the contingent of students studying at the institute to thirty thousand people. Karaganda Polytechnic Institute has become one of the major universities of not only Kazakhstan, but also the republics of Central Asia. Abylkas Saginovich ensured that the institute was secured with the building of the trust «Karaganda coal incision», this building was used to house the military department.

The last brainchild of A.S. Saginov — the building of the mining department, which still attracts with its architectural beauty. Taking care of strengthening the material and technical base of the institute of new corps and buildings, Abylkas Saginovich Saginov at the same time did not forget about the scientific, pedagogical and educational work in the team, the creation of new departments, laboratories, selection and placement of teachers and scientists. At the Department of Mineral Development A.S. Saginov created a scientific school on technology and integrated mechanization of the development of mineral deposits, which has received wide recognition both in Kazakhstan and in the near and far abroad. The department twice won the title of the best in the republic in scientific and educational activities. Today, the department has four doctors of technical sciences, professors, eleven candidates of technical sciences, associate professors. All of them are students of A.S. Saginov, among them — N.A. Drizhd, B.T. Berkaliyev, T.K. Isabek, V.F. Demin and others. During the period of scientific and pedagogical activity, being on the post of the rector and the head of the department, A.S. Saginov made a significant contribution to the development of the mining industries of Kazakhstan, as well as to the training of highly qualified specialists.

March 3, 1958, the day when the Council of Ministers of the USSR adopted Resolution No. 127 «On the transformation of the Karaganda Mining Institute into the Karaganda Polytechnic Institute», can be considered as the second birth of the institute. The opening of the Karaganda Polytechnic Institute was caused by the accelerated development of the ferrous metallurgy, mining and engineering industries in Central Kazakhstan and the increased need for new engineering specialties. Every year the number of students of the Karaganda Mining Institute increased. Therefore, in 1958, only in the first year of full-time studies 425 students were enrolled. In the same year, the institute released the first group of engineers — 158 people, 41 of them were Kazakh [4; 79]. In the first year of full-time education, in the 1959–1960 academic year, 350 people were enrolled, of whom 167 had industrial work experience in various sectors of the national economy for more than 2 years and 38 people joined the institute from the ranks of the Soviet Army and Navy. At the beginning of the 1959–1960 school year, 1436 students were enrolled in this institution of higher education. During the school year, 25 people from other universities arrived at the institute. At the end of the school year, the institute carried out higher vocational training for 1137 people [5; 18–20].

The total number of staff of the scientific and pedagogical cadres of the Karaganda Polytechnic Institute on September 1, 1960 was 160 people: 1 professor (PhD), 27 associate professors (including 19 PhDs), 46 senior lecturers (including 8 candidates of technical sciences), teachers of 25 people, assistants 61 (including 1 candidate of technical sciences) [5; 14].

By the beginning of the sixties, the educational process and research work were already carried out at 20 departments: Marxism-Leninism; physics; higher mathematics; chemistry; foreign languages; geology; descriptive geometry and graphics; theoretical mechanics and materials resistance; physical education; elaboration of mineral deposits; mining machines and miner vehicles; mining mechanics; construction of mining enterprises; geodesy and surveying; construction technology; heat engineering and metallurgical furnaces; general electrical engineering; metal technology; mine ventilation and safety engineering; economy, organization and planning of mining enterprises. Twenty five specialized training laboratories and 7 subject rooms were created. In 1960, the evening faculty of the institute was opened in Balkhash, which until 1977 provided training for engineers on-the-job. In 1977, this faculty was reorganized into a general technical. In 1961, the evening faculty was opened in the city of Dzhezkazgan, which carried out the production of specialists without interrupting production. In connection with the formation of the Dzhezkazgan region, the subsoil of which is an inexhaustible pantry of the most valuable mineral raw materials, and in order to provide engineering personnel to fast-growing sectors of the national economy, in 1973 in Dzhezkazgan the full-time education was opened. In 1977, on the basis of this faculty, a branch of the institute was organized with full-time and evening classes. In 1972 from the Pavlodar Industrial Institute transferred to the structure of the Karaganda Polytechnic Institute Kokchetav General Technical Faculty (GTF). In 1978, the Petropavlovsk (GTF) was transferred from the Ural Polytechnic Institute, transformed in 1982 into an evening branch of the institute. In 1980, the Department was opened in the city of Tselinograd. The institute became a forge of not only engineering, but also scientific personnel, by whose efforts large research work was carried out on contractual and state budget themes. From year to year funding of research works had been growing [6; 7–8].

At the end of 1966, a joint Council for the Protection of Candidate Theses in several specialties was established at the Institute. A postgraduate course was opened, where the most talented graduates were taken, who actively participated in the work of the student scientific community and showed a practical propensity for scientific research. Graduate students were supervised by more than 40 doctors and candidates of science. In total, they successfully defended their theses on the specialized Council of KarPTI over 500 people. The high level of scientific research of our scientists is marked by various government awards. In 1966, Professor E.I. Shevsov for the development and implementation of the accelerated method of welding of large open-hearth furnaces for large open-hearth furnaces. Shevtsov was awarded the USSR State Prize as part of a team of metallurgical scientists. In 1974, the AS Laureates of the State Prize of the Kazakh SSR in the field of science and technology. Saginov, Yu.A. Wexler, J.E. Yerzhanov for their work on rock mechanics «Study of creep and destruction of rocks in order to calculate the strength and stability of underground structures». For the discovery and successful development of a number of large mineral deposits L.F. Dumler. As part of the creative team, Dumler was twice awarded the USSR State Prize. Diploma and award named after academician A.A. Skochinsky received in 1980 M.A. Ermekov for the cycle of work on the physico-chemical principles of the fight against methane in coal mines. The State Prize of the Kazakh SSR in 1987 was awarded to the author team of scientists — A.S. Saginov, A.G. Lazutkin, I.A. Janzen and D.N. Eshutkinu for «Developing a Theory and Creating Hydraulic Impacting Machines». For their success in

research, the laureates of the USSR Ministry of Higher Education award were S.S. Kwon and I.E. Ermekov. Laureates of the Prize of the Council of Ministers of the Kazakh SSR in the field of science and technology received diplomas for the cycle of management of the stability of career slopes in 1987 received I.I. Popov, R.P. Okatov, P.S. Shpakov, G.G. Poklad, F.K. Nizametdinov. In 1991, for the development and implementation of hydro-elevator installations N.N. Bezuglovu, A.Ya. Gorchakov, N. Imu, G.G. Lartsevu and A.N. Sinchukov was awarded the title of laureate of the Prize of the Council of Ministers of the Kazakh SSR in the field of science and technology. The winner of the Leninsky Komsomol Prize of Kazakhstan in the field of science and technology was A.Z. Isagulov for «Research and development of impulse processes of compaction of casting molds». The Institute was a permanent member of Exhibition of Achievements of National Economy. It was received more than 600 copyright certificates. In the socialist competition in honor of the 50th anniversary of the USSR in 1972, the institute was awarded the commemorative badge of the Central Committee of the Communist Party of the Soviet Union (CPSU), the Presidium of the Supreme Soviet of the USSR, the Council of Ministers of the USSR and the all-union Central Council of Trade Unions. For achievements in training engineering personnel for the national economy and performing scientific research in the IX five-year plan, by decree of the Presidium of the USSR Supreme Soviet in 1976, the institute was awarded the Order of the Red Banner of Labor. In the same year, the Institute was awarded an honorary diploma and entered into the Golden Book of Honor of the Kazakh SSR for its high performance in fulfilling the tasks of the five-year plan. In 1979, for achieving the highest results in all-union socialist competition, increasing production efficiency and quality of work, and successfully fulfilling the economic and social development plan, the institute's team was awarded the passing Red Banner of the CPSU Central Committee, Council of Ministers of the USSR, the all-union Central Council of Trade Unions and all-union Komsomol Central Committee. An event of exceptional importance was the handing of the rolling Red Banner of the CPSU Central Committee and the USSR Council of Ministers to the Karaganda Polytechnic Institute in 1980. N.F. Krasnov in an interview with the popular newspaper «Student Meridian» noted «... Socialist competition is the most important economic lever; it is an indispensable educational tool. Recently, I carried out an honorary assignment from the Central Committee of the CPSU, the Council of Ministers of the USSR, the all-union Central Council of Trade Unions and the Central Committee of the Komsomol — I handed the Red Banner to the Karaganda Polytechnic Institute. In total, there are 870 universities in our country, and everyone participates in socialist competition. Only two were recognized as winners in 1980: the oldest Moscow State University named after M.V. Lomonosov and Karaganda Polytechnic Institute, biography of which fits just a quarter of a century. Nevertheless, for this insignificant period, people from Karaganda managed to do a lot. Twenty-one thousands of its pupils successfully work in the national economy of the country. They are over 700 teachers, of whom every second has a degree and about 11 thousand students.

Currently, an integrated University Innovative Scientific and Technical Complex (UISTC) is organized at KSTU, including 7 research institutes, 35 research laboratories, 3 scientific and technical centers, a Center for Student Innovations, an Engineering Profile Laboratory, and «POLITEH» Technopark, which includes 4 enterprises. To provide engineering personnel initiated by the President of the State Program of Forced Industrial-Innovative Development of the Republic of Kazakhstan for 2010–2014 (SPFIID).

The university prepared and employed 1096 people at 59 existing enterprises-projects of the Industrialization Map of the Karaganda Oblast, and for 94 State Program of Industrial-Innovative Development-2 projects, it is planned to train 3320 specialists. Successful implementation by the university of engineering training in the framework of the new industrialization is based on unique intellectual and scientific-production resources. Since 2008, the Corporate University teaching and research and production cluster has been successfully operating on the basis of KSTU, which includes 86 key enterprises and research centers of Kazakhstan, France, Germany, Austria, China, Russia, Belarus and Uzbekistan. The university was the first in Kazakhstan to implement the Presidential assignment and introduced dual training in the higher education system with assignment of the 18 most demanded working qualifications. At the backbone enterprises of the cluster «Corporate University» there are 60 branches of the departments for the implementation of the dual system of training. The international activity of KSTU is carried out within the framework of 140 contracts with foreign partner universities. KSTU is the only Kazakhstan participant in the international scientific and educational project «Synergy», which is implemented under the auspices of the German-Austrian concern «FESTO» — the world leader in Industry 4.0. At the initiative of the President of the country Nursultan Nazarbayev in Kazakhstan, the process of modernizing the system of technical and vocational education has begun, so that the country receives effective and competitive specialists. Indeed, in the conditions of the fourth industrial revolution undergoing, fundamentally new approaches to

the training of personnel with a new technological order are required. The renewal of the structure and content of technical and vocational education, taking into account the demands of industrial-innovative development of our country's economy, is reflected in the State Program for the Development of Education of the Republic of Kazakhstan for 2011–2020.

In the Karaganda State Technical University the «Trinity of Languages» Center is functioning. It bears the name of the great philosopher, poet and educator Shakarim Kudaiberdiev, which creates conditions for intensive and high-quality education in Kazakh, Russian and English. Various events are held here, international contracts are concluded with universities in the near and far abroad, creative contests, round tables, language contests are held, and with the assistance of the center, the children travel abroad to communicate with native speakers in the USA, UK, Germany, France. Based on the Center for the Trinity of Languages named after S. Kudaiberdiev, together with the Confucius Institute, courses on the study of the Chinese language are opening, and events will be held on the history and culture of China.

The library of the university, which has more than one and a half million copies of scientific, educational, reference and informational literature in traditional and electronic media, is a unique center of intellectual communication. It is annually updated with more than 40 thousand new books and about 800 periodicals. The library has information and education center with a rich collection of communicatory and reference books, electronic teaching aids and three electronic reading rooms. One of the most important directions of the development of innovation education is the student bureaus: «Construction and Architecture», «Space Technology and Technologies», «Automation and Management of Technological Processes», «Software for Educational Activities» and others that contribute to student creativity.

A higher education institution is a special environment that forms the foundation of a person through numerous humanitarian and special disciplines, communication with erudite teachers interested in students, scientific activities, and diverse student life. All generations of our students, wherever they work, will forever remain members of one large family and call their alma mater — the home. The concept of «home» is embedded friendliness, soul kinship, understanding and common goals. The University has created and maintained a bright and recognizable corporate company style, which is manifested in the design of buildings, stands, signboards, printed materials of the university. Image production of the university: caps, T-shirts, pens, notebooks, calendars and badges with blue-and-white symbolism are very popular with students and teachers. An important component of university corporate culture is working with alumni. Even after parting with the university many years ago, graduates feel involved in the alma mater and can participate in the activities of the «Association of teachers and graduates of KSTU», which helps both students and the university as a whole. Not a single major university event can do without the sponsorship of the association.

KSTU has all conditions for self-development, personal growth of students. Any creative student can choose an activity to his liking from a wide range of proposed areas: research work, amateur art activities, debate club, work in student government bodies, etc. Today, the faculty of KSTU sets itself challenging, ambitious goals related to the training of engineers-specialists of the new formation, highly educated, competitive, possessing all the necessary knowledge to perform the tasks outlined by the entire society. We all understand very well that in the modern world there is only one competitive resource — human intelligence. To activate it and make maximum use for the benefit of society, without losing moral and spiritual values is the task of the new generation of scientists, teachers and young talents at our University. It is only necessary that this was a stubborn aspiration. It is for nothing that said that only one who always considers his education incomplete can be considered an educated person.

Today KSTU is a large scientific center. International, republican, regional scientific and technical conferences held by the University gather academic elite, young graduate students, undergraduates, students, specialists of the largest enterprises in the region, the republic, the CIS countries and abroad. The University signed memorandums of cooperation with the Slovak State University, Zittau-Gertlitz Institute (Germany), with the University of Bolton (Great Britain), the Rochester Institute of Technology (USA), the Technical University of Kosice (Slovakia), the Technical University of Applied Sciences (Wildau, Germany) and the Tomsk Polytechnic University (Russia), the Ural State Technical University. The university participates in three international TEMPUS projects on the development of training standards and the creation of innovative enterprises.

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Қарағанды мемлекеттік техникалық университетінің қалыптасу және даму тарихы

Мақалада Қарағанды мемлекеттік техникалық университетінің қалыптасу және даму тарихы соғыстан кейінгі елуінші жылдары өндіріш күштерінің дамуымен, сондай-ақ өспелі сұраныс көмір және басқа да минералдық-шикізат ресурстары құрылысына байланысты ірі қара және түрлі-түсті металлургия орындары және Орталық Қазақстан аймағында темір, мыс және басқа да полиметалл жаңа кен орындарының ашылуымен тығыз байланысын көрсеткен. Мақаланың мақсаты — Қарағанды мемлекеттік техникалық университетінің қалыптасу және даму тарихын мұрағаттық құжаттар негізінде зерделеу. Ұсынылған ғылыми жұмыстың міндеттері оқу-материалдық базасының жағдайын, Қарағанды тау-кен институтының ғылыми-педагогикалық және тәрбие жұмысы жүргізілетін ұжымдарды, сондай-ақ жаңа кафедралардың, зертханалардың, кадрларды іріктеу және орналастыру, оқытушылар, ғалымдар туралы ақпаратты жүйелі түрде зерттеу болып табылады. Студенттер мен профессор-оқытушылар құрамы және әлеуметтік жағдайы қарастырылған. Оқу орнының құрылуына атсалысқан, 30 жылдан астам институт ректоры болған Социалистік Еңбек Ері, Қазақ ССР екі мәрте Мемлекеттік сыйлығының лауреаты, ҚР ҰҒА академигі Сағынов Әбілқас Сағыновичқа ерекше көңіл бөлінген. Ә.С. Сағынов тау-кен өндіруші өнеркәсіп салалары, сондай-ақ жоғарыбілікті мамандар даярлауға, дамытуға елеулі үлес қосқан адам. Зерттеудің өзектілігі қазіргі Қазақстандағы жоғары техникалық білім беру жүйесін жаңғырту міндеттерінің кешенімен негізделген. Техникалық білім беруді жаңғырту, әлемнің педагогикалық картинасының прогрессивті идеяларының бірі бола отырып, отандық білім беруде, әдетте, ғасырлар тоғысында жанданады. Демек, білім беруді жаңғырту кезеңінде әдіснамалық өзгерістердің қажеттілігін ұғыну, оқытудың жаңа әдістерін іздеу, әлеуметтік базаны кеңейту және жоғары деңгейдегі оқу орындарын құру орын алады. «Аралық педагогиканың» бұл үдерістерін қазіргі заманғы білім беру реформаларының жобаларында Қарағанды мемлекеттік техникалық университетінің мысалында көруге болады.

Кілт сөздер: жоғары техникалық мектеп, Қарағанды мемлекеттік техникалық университеті, студенттер, оқытушылар, жоғары білікті инженерлер, Орталық Қазақстан облысы, Қазақстан.

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История становления и развития Карагандинского государственного технического университета

В статье рассмотрена история становления и развития Карагандинского государственного технического университета, открытие которого связано с развитием производительных сил Казахстана в послевоенные пятидесятые годы, а также возросшим спросом на уголь и другие минерально-сырьевые ресурсы в связи со строительством гигантов черной и цветной металлургии и открытием новых перспективных месторождений железных, медных и других полиметаллических руд в Центрально-Казахстанском регионе. Целью данной научной статьи стало изучение на основе архивных документов истории становления и развития Карагандинского государственного технического университета. Задачами представленной научной работы являются исследование состояния учебно-материальной базы Карагандинского горного института, научно-педагогической и воспитательной работы, проводимой в коллективе, а также создание новых кафедр, лабораторий, подбор и расстановка кадров преподавателей, ученых. Прослежен контингент студентов и профессорско-преподавательского состава института. Особое внимание обращено на Героя Социалистического Труда, лауреата Государственной премии Казахской ССР, академика НАН РК Абылкаса Сагиновича Сагинова, который стоял у истоков создания института и был ректором более тридцати лет. А.С. Сагинов внес значительный вклад в развитие горнодобывающих отраслей промышленности Казахстана, а также в подготовку специалистов

высшей квалификации. Актуальность исследования обусловлена комплексом задач модернизации системы высшего технического образования в современном Казахстане. Модернизация технического образования, являясь одной из прогрессивных идей педагогической картины мира, активизируется в отечественном образовании, как правило, на рубеже веков, когда напряжённое настоящее становится рубежом между традиционным «прошлым» и зарождающимся «новым». Следовательно, в период модернизации в образовании происходит осознание необходимости методологических изменений, поиски новых методов обучения, расширение социальной базы и создание учебных заведений более высокого уровня. Эти процессы «рубежной педагогики» можно проследить и в проектах современных образовательных реформ на примере Карагандинского государственного технического университета.

Ключевые слова: высшая техническая школа, Карагандинский государственный технический университет, студенты, профессорско-преподавательский состав, высококвалифицированные инженеры, Центрально-Казахстанский регион, Казахстан.

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