

Konys Zh.K.

The Role of Small Innovation Enterprises under Higher Educational Institutions in Increasing of Competitiveness of Human Capital

Kazakhstan stepped into a new technological wave. The pace and mechanism of economic development changed accordingly. Taking into consideration new requirements of the world economy, the country chose the way of industrial innovative development. Main driving force of innovative development is human capital. However, today in Kazakhstan, there is no clear mechanism to form and develop competitive human capital in terms of industrial innovative development. This article considers problems of creating small innovative enterprises (SIE) under higher educational institutions (HEI) of Kazakhstan to develop human capital of the country. The experience of European countries and America related to the issue was analyzed. Principles of operation of SIEs in foreign countries were reviewed. Based on the performed analysis the author defined the role of the SIE in enhancing the competitiveness of the country's human capital. Also the solutions to adapt the foreign SIE models to domestic conditions were offered.

Key words: human capital; innovation; industrial innovative development; small innovative enterprise; business and science.

Қоныс Ж.К.

ЖОО жанындағы шағын инновациялық кәсіпорындардың адами капиталдың бәсекеге қабілеттілігін арттырудағы орны

Қазақстан жаңа технологиялық бағытқа түсті. Сондықтан экономиканың даму жылдамдығы мен құралдары да өзгеруде. Әлемдік экономиканың жаңа талаптарын ескере отырып, еліміз дамудың индустриалды-инновациялық жолын таңдап алды. Ал инновациялық дамудың негізгі күші адами капитал болып табылады. Бірақ бүгінгі таңда Қазақстанда индустриалды-инновациялық даму шеңберінде бәсекеге қабілетті адами капиталды қалыптастыру мен жетілдірудің нақты тетігі жоқ. Берілген мақалада елдің адами капиталын дамыту мақсатында Қазақстанның жоғары оқу орындарының (ЖОО) жанына шағын инновациялық кәсіпорындар (ШИК) құрудың мәселелері қарастырылған. Аталған сұрақ бойынша еуропа елдері мен АҚШ-тың тәжірибесі сарапталған. Шет елдердегі ШИК қызмет ету қағидаттары талқыланған. Өткізілген сараптама негізінде адами капиталдың бәсекеге қабілеттілігін көтерудегі ШИК маңызы анықталған. Сонымен қатар автор ЖОО жанындағы ШИК үлгісін Қазақстан талаптарына сай бейімдеу сұрақтарының шешімін ұсынады.

Түйін сөздер: адами капитал; инновация; индустриалды-инновациялық даму; шағын инновациялық кәсіпорын; бизнес және ғылым.

Қоныс Ж.К.

Роль малых инновационных предприятий при вузах в повышении конкурентоспособности человеческого капитала

Казахстан вступил в новый технологический уклад. Однако на сегодняшний день в Казахстане не существует четкого механизма формирования и развития конкурентоспособного человеческого капитала в контексте индустриально-инновационного развития. В данной статье рассмотрены проблемы создания малых инновационных предприятий (МИП) при высших учебных заведениях (ВУЗ) Казахстана для развития человеческого капитала страны. Проанализирован опыт европейских стран и Америки в данном вопросе. Рассмотрены принципы функционирования МИП в зарубежных странах. На основе проведенного анализа автором определена роль МИП в повышении конкурентоспособности человеческого капитала страны. Также предложены решения адаптации зарубежной модели МИП к отечественным условиям.

Ключевые слова: человеческий капитал, инновация, индустриально-инновационное развитие, малое инновационное предприятие, бизнес и наука.

**THE ROLE OF SMALL
INNOVATION
ENTERPRISES UNDER
HIGHER EDUCATIONAL
INSTITUTIONS IN
INCREASING OF
COMPETITIVENESS OF
HUMAN CAPITAL**

Problem setting. The real economy sector of the Republic of Kazakhstan, notwithstanding huge resource capacity of primary industries, opportunities for production increase by means of extensive factors, are generally exhausted. Within the framework of entering the new technological setting, Kazakhstan must focus on accelerated development, as well as on modernization of such branches as electronic, nuclear and electrical industries. For this purpose, the country has a number of so-called auxiliary elements in the form of human capacity, and significant scientific foundation.

Recent research and publication analysis. Despite the numerous studies carried out in the interests of innovation development of Kazakhstan and the development of human capital, the feasibility of small innovative enterprises creation at the Kazakhstan institutes of higher education remains poorly studied.

Russian scientists, S. Alexandrova, M. Badaev and N. Zotov, in their works have shown the importance and potential of small innovative enterprises at institutes of higher education. Among local scientists, this issue is reflected in the studies of D. Begezhanov.

Objective of the research is to define the role of small innovative enterprises at institutes of higher education in improving the competitiveness of human capital through the analysis of foreign experience and adaptation of the existing model, taking into account the realities of Kazakhstan.

Theoretical and methodological basis of the research are fundamental works and provisions of local and foreign scientists in the area of improvement of human capital during the innovative development, formation of an innovative system of higher education and integration of business, science and education.

Key research findings. Creation of a small innovative firm based on a HEI would provide the HEI with a number of advantages: additional source of funding the operation of the HEI, implementation of scientific innovative projects of educational establishment, stimulation of research activities, obtaining practical knowledge by students, raising competitiveness of graduates at the job market, raising the image of the HEI itself.

It should be marked that in the overseas countries small enterprises under HEIs successfully work since the middle of the

past century. More successfully, this process, for example, develops in universities of Germany, Sweden and the USA.

Thus, HEIs in Germany create own centers to support small entrepreneurship. Four large German scientific research organizations – the Max Planck Society, the Fraunhofer Society, the Leibniz Association and the Helmholtz Association have consistent subdivisions, which support scientists in the sphere of implementation of scientific results under universities and scientific research institutes. Services, provided by the HEIs, are concluded, in particular, in consulting and assistance in creation of the innovative enterprise, preparation of a business plan [1].

At present, approximately 300 technological innovative centers provide assistance to start-up entrepreneurs, focused on creation of technological innovative firms under scientific research and educational establishments. The preference is given to works in the sphere of information-communicative, optical and laser technologies, materials science, biotechnology and medical engineering, and energy saving technologies and environmental technologies.

Small innovative enterprises under HEIs can apply for support to the Fund HTGF (High-Tech Grunderfonds), which was created for the founders of enterprises, engaged with the sphere of high technologies. The Fund, created by Federal Ministry of Economics and Technologies of Germany, invests venture capital to young perspective enterprises.

Sweden implements a model, combining the freedom of HEIs in commercialization of results of intellectual activity created by them, with instruments, aimed at achievement by the state of benefits from produced inventions. Forms of cooperation between HEIs and business may be different: creation of special subdivisions, engaged in commercialization of research results at HEIs; establishment of special consulting organizations and forums for cooperation with external market players; creation of specialized subdivisions consulting on economic and legal issues; creation of holding companies which main tasks include holding, management and administration of shares of companies, which aim is to facilitate commercial distribution of the results of research activities at the relevant university. Today the Government of Sweden has founded 14 holding companies under HEIs.

One more form of cooperation between business, state and universities are centers of expertise, which act as the liaison under the framework of cooperation of several research teams from the university and some partners from the sphere of

industry. Main task of the centers of expertise is to facilitate the performance of problem-oriented interdisciplinary researches, and conversion of new knowledge and competence into new products, processes and services. In addition, in Sweden, centers of technology transfer are created under the HEIs, which main task is to assist in compilation of a business plan, expertise of innovative projects, provision of consultants for the entire period of establishment of a small innovative enterprise (SIE).

In the USA, the principle of SIE operation under HEIs is a triad: from fundamental institutional knowledge through national laboratories to commercialization of technologies. Large national laboratories are established under the leading universities, around which a so-called belt of small and medium-sized enterprises is operating. Most part of long-term innovative research is performed, in particular, in universities. Universities provide private laboratories and industrial enterprises with innovative projects [6]. It should be noted that most number of scientific discoveries and inventions were made in small innovative enterprises under universities. At the same time, authors of scientific discoveries and inventions often were the founders of SIE and acted as entrepreneurs.

Analysis of the innovative development level of the country, the share of innovation active enterprises in the country, and the volume of science funding shows that direct copy foreign experience is not possible for Kazakhstan. In domestic conditions the use of foreign experience is possible with some adaptation of SIE model functioning at HEI. Table 1 shows the adapted (simplified) procedures, which will lead to the effective functioning of the SIE.

However, in creation of small innovative enterprises under HEIs, a number of problems may arise, which solutions should be foreseen beforehand. In particular, a problematic issue may be leasing of premises and scientific equipment. It is thought that founders of SIE should be exempted from payment for lease of the premises used during the first two years of their activity. Lease payment in subsequent years can be performed according to the following scheme: 3-rd year – 10% from commercial cost, 4-th year – 20%, 5- th year – 30%.

At the same time, there may be issues, related with registration by budget organizations of patents for inventions and other results of intellectual activity. It is reasonable to take into attention the experience of development of technology commercialization abroad, where the most important thing in development of the mechanism of introducing into business turnover of the results of scientific-engi-

neering activity and objects of intellectual property, created at the expense of state funds, is providing

the rights for intellectual property to organizations-developers [5].

Table 1 – Adapted model of SIE operation under HEIs of the RoK

№	Procedure	Effect
1	Creation of centers of expertise of innovative projects based on HEIs	Identifying of the relevance of idea at the earliest stage, which will significantly reduce the percent of inefficient and marginal projects
2	Establishment of centers of technology transfer under HEIs with a wider range of opportunities	Assistance in establishing a contact with partner enterprises, assistance in searching personnel, forming and maintaining customer base at the earliest stage of SIE development
3	Organization of holding firms under HEIs	Arrangement and coordination of activities of smaller subdivisions under universities, providing support to SIE
4	Application of the USA experience on creation of large institutional research laboratories	Realization of link in the chain «HEI – small innovative enterprise» through these laboratories
Note – compiled by the author		

Personnel might be a challenging issue in small innovative enterprises. The origination of the problem is predetermined by such factors as: lack of personnel, low professional quality of young intelligence, lack of opportunities for young people to implement creativity in terms of financial deficit, unwillingness of young generations to commit their life to science [4]. Hence, there is another problem – to – get students interested with research works at initial stages of training. It is necessary to invest into renovation of scientific-librarian funds, internet-equipment for workshops, educational experimental and scientific work, and to support cooperation communications with scientific institutions, based on which teaching can be performed.

Another important problematic issue may be insufficient financial support and lack of real financial-credit mechanisms of provision of such support [2]. Small innovative enterprises under HEIs may not have expensive material-technical base to create experimental samples. In such a case, it is required to attract sources of external funding of SIE under HEIs intensively, developing modifications of frameworks of venture funding of innovative projects, business angel network, encouraging participation of SIE under HEIs in international projects.

Modern state policy in the sphere of reformation of higher vocational education of the RoK advances as one of predominant forms of arrangement of higher educational institutions a so-called innovative model of a HEI. With creation of SIE, universities must become educational organizations of a business type, which basic operational

purpose is to improve their competitiveness in relevant segments of national economy. Activities of HEIs must be reconstructed in the line of their commercialization and creation on their basis of innovative competitive business-structures, interacting with enterprises – employers and strategic partners of universities in the sphere of educational, scientific research, design and experimental and production activities.

Criteria of integrative interaction shall be: maximum employment of the graduates of a particular institution of vocational education; a number of long-term contracts on cooperation; existence of additional source of funding; coordination of activities of business structures, research projects and educational programs; creation of effective economic structures of small science-based business; creation of educational scientific production centers of provision of personalized programs and teaching technologies of young specialists; development of innovative technologies in education, science and business [3].

Conclusions

As the analysis of foreign practice shows, one of the innovative development factors is the competitive human capital, and an important factor for the formation of strong human capital – is an existence of small innovative enterprises at institutes of higher education.

Adapted to the conditions of Kazakhstan, SIE model at HEI is able to operate effectively in the

above-mentioned application of decisions for personnel, legal and financial issues.

Activities of SIE under HEIs will promote improving innovative activity in the region, growth and development of firms, arrangement of cooperation between researchers and industry. In addition, SIEs will provide high quality training of innovative managers, promote acceleration of real

economic development based on creation of regional and international networks for informational exchange and cooperation between enterprises. SIEs will ensure opportunity for enterprises in the sphere of production to reduce costs for searching innovations, to reduce time limits for their implementation and therewith to improve the quality of products and their own competitiveness.

References

- 1 Alexandrova S. Yu., Badayev M. M. Application of International Experience in Forming Innovative System of Higher Vocational Education in Russian Federation. – M.: IILE named after A.S. Griboyedov (Institute of International Law and Economics named after A.S. Griboyedov), 2010. – 235 p.
- 2 Badayev M.M. Problems and Perspectives of Development of Small Innovative Enterprises under HEIs // *Transportnoye Delo Rossii* (The Transport Business of Russia) – 2011. – No. 4. – P. 35- 38.
- 3 Begezhyanov D. Development of Small Innovative Entrepreneurship // III International Economic Congress: Strategic Perspectives of Innovative Development of Kazakhstan Economy. – Karaganda, 2006. – P. 25 -32.
- 4 Zotova N. Training Innovative Project Managers // *Collection of Research Papers: Modern Management: Problems. Hypotheses, Researches.* – Moscow, 2009. – P. 458 – 461.
- 5 Khudokormova O. Problems of Legal Regulation of Innovations and Innovative Activity // *Research-Practice Conference of the Institute of Legal Studies under Moscow State Academy of Law: Protection of Rights and Legitimate Interests of a Person.* – Moscow, 2008. – P. 187 -190.
- 6 *The USA Competitiveness // Review* – Moscow, 1988. – 37 p.