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DEVELOPING INNOVATIVE POTENTIAL OF UNIVERSITY: ORGANIZATIONAL ASPECTS AND DEVELOPMENT TRENDS

Abstract

The author made an attempt to analyze the current situation of the innovation potential development in high educational institution in Kazakhstan. According to the Program of innovative development of the RK until 2020 formation of national system of competences and increase in prestige of the Kazakhstan higher education in the international education market, have to become the main criterion of competitiveness of education. In this article the author reviews the place of the Republic of Kazakhstan in the global competitiveness index in "Innovation capability" section from 2013 to 2018, summarizes the approaches to the definition of concepts of innovation potential and its components, the role of high educational institutions in the country's innovative development studding domestic and foreign researchers works. In addition, L.N. Gumilyov Eurasian National University rank in the World University Rankings and the university's innovation infrastructure is shown in the article. The present findings confirm that there are quite infrastructure, good indicators of development, and groundwork for research in L.N. Gumilyov Eurasian National University. Nonetheless, the author notes existence of several problems and questions as well as suggests solution with using the Triple Helix model. The thesis of the Triple Helix is that the potential for innovation and economic development in a knowledge-based society lies in the more prominent role of the university and in bringing together elements like university, industry and government to create new institutional and social forms of production, transfer and application of knowledge.

Key words: high education, innovative potential, national university, competitiveness, infrastructure, development.

Kazakhstan is aware of the importance of innovation for its socio-economic development, including the diversification of its resource-based economy. Since the start of the millennium, Kazakhstan has put in place key components of a modern research and innovation system. This has helped to improve scientific output and resulted in some successes in technology commercialization. Further commitment and effort will be needed to strengthen innovation capabilities and make the most of Kazakhstan‘s advantages. This requires further reforms in order, notably, to strengthen the funding model of universities, intensify and broaden knowledge transfer, improve the governance of the research and innovation system, and increase the effectiveness of innovation incentives and policies, with a focus on implementation and evaluation.

Global Competitiveness Index and Ranking prepared by World Economic Forum shows that in 2018 Kazakhstan ranked 87 on "Innovation Capability" out of 140 countries in the world (Table 1) [1].

Table 1 – Global Competitiveness Index and Ranking: Kazakhstan, 2013–2018

Category	2013	2014	2015	2016	2017	2018
Innovation Capability, score	31	31	33	34	32	32
Innovation Capability, rank	95	90	86	79	87	87
Note – Research Sources: World Economic Forum, 2018.						

These results are a demonstration of efforts necessity at encouraging R&D in the country. In order to succeed in a fast changing global economy, Kazakhstan should continue to drive innovation and channels technology resources into economic value for strengthening the country's competitiveness.

The policy of the Republic of Kazakhstan on the development of innovation is aimed at building a national innovation system that improves the competitiveness of the economy. It is being realized by creating a system of innovation and technological development management, industries and regions' innovative development, creating conditions for the development of high-tech small and medium-sized businesses and improving the scientific and engineering potential of the country, as well as the

development of infrastructure of innovative clusters [2]. Undoubtedly, high educational institutions with theirs intellectual resources, research works and research centers pay an important role in the formation of a national innovation system.

The traditional university system today is undergoing a process of fundamental changes caused by the new needs of social development, the construction of the information society, fierce competition in the market of educational services, which requires the implementation of a new role of universities not only as centers of science and education, but also as the main subjects of innovation.

The purpose of the paper is attempting to analyze the current situation of the IP development in high educational institution in Kazakhstan.

To achieve this purpose the following research tasks have been formulated, which are addressed in turn in this paper:

- to identify the meaning and the structure of innovation potential (IP) in HEIs;
- to monitor the existence of resources needed to develop IP and effectiveness of their using in L.N. Gumilyov Eurasian National University;
- to define the problems and prognosticate the future development of HEI's IP.

The present study uses data from multiple sources. The theoretical and methodological basis of the article consists of the works of scientists of Kazakhstan, CIS, and foreign countries on the formation and development of innovative potential of universities. Authors uses system functional and statistical analyses as a methodological basis of the study. The information base of the study was the data of the World Economic Forum, Internet resources of domestic universities, and data of periodicals.

The literature review shows that the question of HEIs' innovative capacity has an interest among domestic and foreign scientists during the past 10 years. There is a considerable amount of literature on innovation development of Russian universities. Although, modern economics does not clearly define the concept of "innovation potential of university" and, consequently, there are no reasonable approaches to quantifying it.

According to S. Kortov, the role of universities in building a regional innovation system is associated with the development of the following activities: the production of innovative products and services; training for innovation; the formation of infrastructure to support the university's ties with the regional innovation system and the system of commercialization of innovations [3].

In [4] the authors investigated the role of the university in Russian region's innovative development. They noted that the model "triple helix" combines innovative efforts of universities, business and government with the central role of the entrepreneurial university.

V. Skvortsov outlines that the innovative potential of a university allows it to reach a new level of development of continuing education for professionals, and to create conditions for effective coordination of educational and scientific activities of teachers and students [5].

Several studies, for instance [2, 6, 7], have been carried out research on Kazakhstani high educations' role in innovation development of the country and about modern tendencies of universities innovational development. Sitenko D.A. and Yessengeldina A.S. identified the role and opportunities of domestic universities for integration into regional innovation processes [6]. The literature review revealed the lack of knowledge about the research on current situation in innovative infrastructure and potential of universities in the country, as well as possible perspectives in the future.

To participate fully in the regional innovation system, the university should form an innovative infrastructure. Currently, there is an active formation of innovative infrastructure of domestic universities in the RK. At the same time, according to foreign experience, the innovative infrastructure of the university should be formed individually, taking into account its features and scientific orientation. The development of innovative infrastructure of the university can be influenced by the socio-economic characteristics of the region where it is located [6].

Based on the literature studied we identified the components of HEI's innovation potential. We defined following four structural components showed in Figure 1 (p. 250).

Obviously, universities developing of these four elements only in combination can receive curtain results in being innovative. There is a question that is aimed in our research how it works in one of the largest national university in Kazakhstan – L.N. Gumilyov Eurasian National University?

The vision of ENU is a national research university focused on the close integration of education, science and industry.

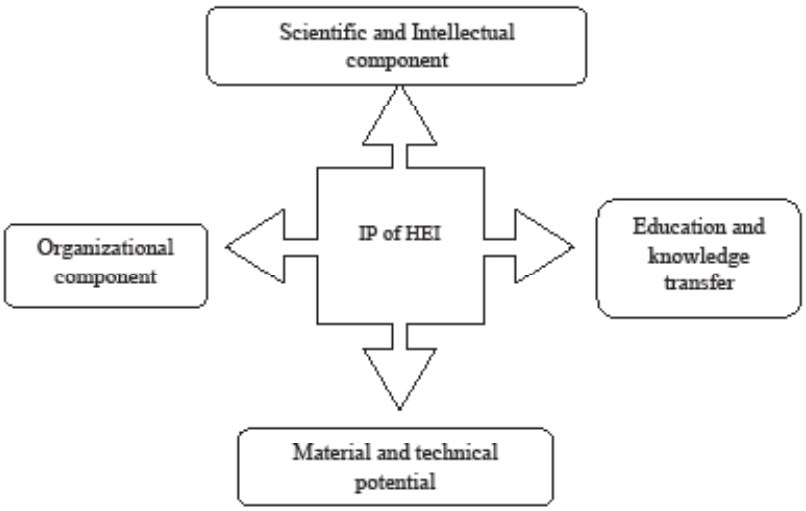

Figure 1 – Components of IP

*Note – Compiled by the author.

A national research university label is granted to HEIs with significant research capacity. Once the government approves their development programme for five years, national universities can independently develop educational programmes of graduate and postgraduate education, conduct fundamental and applied research, and use or transfer the results obtained. So far, only Nazarbayev University and K.I. Satpayev Kazakh National Research Technical University have been granted the status of a research university in 2015 [9].

In this regard, the development of innovative education requires significant improving the level of university science and ensuring its connection with the economy through the formation of innovative infrastructure. We are talking about the development of technology based on research centers, higher education institutions, the creation of extra-budgetary funds to support the innovation of universities.

In ENU, organizational structure of science consists of specialized divisions for encouraging academic staff, scientists and students' research work and developing innovation through the network education-science-business. It that can be seen from the Figure 2.

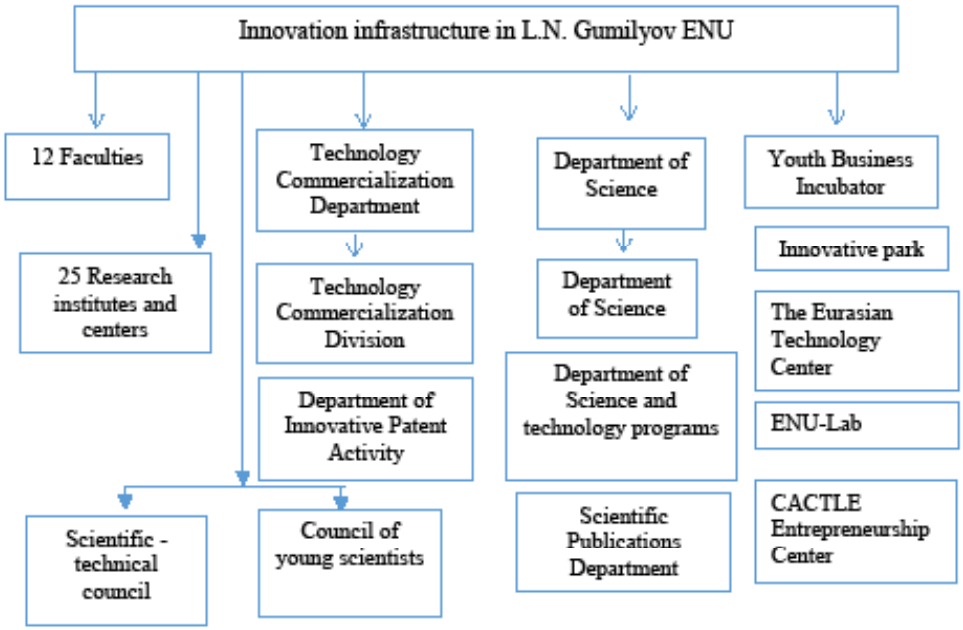

Figure 2 – Innovation infrastructure in L.N. Gumilyov ENU

Note – Compiled by the author according to [10].

According to the mentioned figure, one of the leading universities of the Republic, ENU has implemented the basic elements of innovation infrastructure, which include the Department of technology commercialization; Innovation Park; Technology center and Students business incubator, etc. According to the infrastructure formed in the university, faculties and departments implement new scientific and educational programs in innovative areas. Research institutes and centers carry on scientific – research activity. Departments and divisions implement administrative and organizational work of university innovation management.

ENU Innovation Park was established on October 15, 2011. The purpose of the innovation park is the integration of science – industry – education, development and implementation of innovative projects, solution of science-intensive problems of industry, social sphere.

The Eurasian Technology Center aimed integration of the university science with the industrial sector of the economy of the Republic of Kazakhstan on the basis of the development and implementation of innovative projects of scientists and students at ENU directed to solving technological problems of industry, business and social sphere.

One of the indicator of university activities in developing in areas as research, teaching, infrastructure and overall is the rank in World universities rankings (Table 2).

Table 2 – L.N. Gumilyov ENU and KazNU Al-Farabi in World University Rankings

Name	Rank ENU	Rank KazNu
QS Global World Ranking	394	220
World University Rankings 2019	1001+	801–1000th
University Impact Ranking 2019	301+	–
Asia University Rankings 2019	301–350th	251–300th
Impact Rankings: Industry, Innovation, and Infrastructure	301+	–
Top 50 under 50	46	–
Note – Compiled by the author according to [11].		

From the results, it is clear that ENU takes quite good positions in rankings, although there is still something to strive for. It was the first among Kazakhstani higher education institutions to enter the list of the Top 400 (369th place) world universities according to the QS World University Ranking in 2012.

It is also important to mention that ENU take a high position in such indicators as publications, h-index, and rates of citation among the Kazakh National University al-Farabi and Nazarbayev University. One of the criteria for the effectiveness of research activity of scholars and employees is publication, especially in high-rating journals included in the Web of Science and Scopus databases: the numbers of publications over the past 5 years are 949 and 1329 in the Web of Science and Scopus databases, respectively.

Due to development of scientific schools on natural-technical science and humanities on the basis of the created research centers and institutes more than 160 scientific projects are carried out under fundamental and applied programs of research. In 2018, 100 projects were implemented on the fundamental and applied research: 78 projects on grant financing under the budget program 217 in all seven priority areas; 5 scientific and technical programs and 2 government assignments for targeted program financing; 15 research projects with business entities from the non-governmental sector. The total funding for research and development in 2017 amounted to 1,530,025,802 thousand KZT [10].

To conclude, the present findings confirm that there are quite infrastructure, good indicators of development, and groundwork for research in the university. Nonetheless, we should notes existance of several problems and questions:

- material and technical resources of university are updated at an insufficient pace;
- outdated material and technical base and equipment of laboratories do not allow to conduct high-quality scientific research;

◆ there is no mechanism of interaction of design institutes, design bureaus and production with universities;

◆ the scientific potential of universities in Kazakhstan is used very inefficiently;

◆ weak link between education, science, and production;

◆ lack of economic incentives for the private sector to invest in education, science and innovation;

◆ the share of scientific developments remains below the level adopted in developed countries, more than ten times.

Practical solution for these problems is to implement the Triple Helix model through following:

◆ to study of the experience of advanced countries in innovative development through the triple helix model;

◆ to development of communication with production through the creation of joint scientific and technical programs involving both public and private investments;

◆ formation of research groups on the basis of universities, in which theorists and practitioners will work, generating inventions and creating spin-off companies and new products, etc;

One concern about the findings was that there are no open data on science and innovation related statistics and difficulties with evaluating the innovation potential. This assumption might be addressed in future studies.

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Аңдатпа

Мақалада автор Қазақстанның жоғары оқу орнындағы инновациялық әлеуетті дамытудың ағымдағы жағдайын талдауға әрекет жасады. Қазақстан Республикасының 2020 ж. дейінгі Инновациялық даму тұжырымдамасына сәйкес білім берудің бәсекеге қабілеттілігінің басты өлшемі құзыреттіліктің ұлттық жүйесін қалыптастыру және білім беру қызметтерінің халықаралық нарығында қазақстандық жоғары білім берудің беделін арттыру болуы қажет. Бұл мақалада автор Қазақстан Республикасының бәсекеге қабілеттіліктің жаһандық индексі «Инновациялық әлеует» бөлімі бойынша алатын орнын 2013 ж. бастап 2018 ж. дейін қарастырады, отандық және шетелдік зерттеушілердің жұмыстарын зерттей отырып, инновациялық әлеует пен оның құрамдас бөліктерінің ұғымдарын анықтап, елдің инновациялық дамуындағы жоғары оқу орындарының рөлін көрсетеді. Сонымен қатар, мақалада Л.Н. Гумилев атындағы Еуразия ұлттық университетінің әлемдік университеттердің рейтингтеріндегі орны талданады және аталған университеттің инновациялық инфрақұрылымының құрылымы сызба түрінде көрсетіледі. Алынған нәтижелер дамудың жақсы

көрсеткіштеріне қол жеткізілгендігін және жоғары оқу орнында ғылыми-зерттеу жұмыстарын жүргізудің негізі мен инфрақұрылымы құрылғанын сипаттайды. Дегенмен, автор әлі де көптеген мәселелер мен сұрақтардың бар екендігін атап, сондай-ақ үштік спираль (Triple Helix) моделін пайдалана отырып, өз шешімін ұсынады. Үштік спираль тезисі білімге негізделген қоғамдағы инновациялар мен экономикалық даму әлеуеті университеттің елеулі рөлінде және өндірістің жаңа институционалдық және әлеуметтік нысандарын құру, білімді беру және қолдану үшін университет, өнеркәсіп және үкімет сияқты элементтерді біріктіруде.

Тірек сөздер: инновациялық әлеует, жоғары оқу орны, инновация, инновациялық даму, ұлттық университет.

Аннотация

В статье автором сделана попытка проанализировать современную ситуацию развития инновационного потенциала в высшем учебном заведении. Согласно Концепции инновационного развития Республики Казахстан до 2020 г. формирование национальной системы компетенций и повышение престижа казахстанского высшего образования на международном рынке образовательных услуг должны стать главным критерием конкурентоспособности образования. В данной статье автор рассматривает место Республики Казахстан в глобальном индексе конкурентоспособности в разделе «Инновационный потенциал» с 2013 по 2018 г., обобщает подходы к определению понятий инновационного потенциала и его составляющих, роль вуза в инновационном развитии страны, исследуя работы отечественных и зарубежных исследователей. Кроме того, в статье рассмотрено место ЕНУ им. Л.Н. Гумилева в мировом рейтинге университетов и схематично показана инновационная инфраструктура университета. Полученные результаты показывают, что университетом были достигнуты хорошие показатели развития и создана достаточная основа и инфраструктура проведения научно-исследовательских работ. Тем не менее автор отмечает наличие нескольких проблем и вопросов, а также предлагает свое решение с использованием модели тройной спирали (Triple Helix). Тезис тройной спирали заключается в том, что потенциал инноваций и экономического развития в обществе, основанном на знаниях, заключается в более заметной роли университета и в объединении таких элементов, как университет, промышленность и правительство, для создания новых институциональных и социальных форм производства, передачи и применения знаний.

Ключевые слова: высшее образование, инновационный потенциал, национальный университет, конкурентоспособность, инфраструктура, развитие.