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SCIENTIFIC POLICY IN THE REPUBLIC OF KAZAKHSTAN: THE ORIENTATION ON THE CONSTRUCTION OF A KNOWLEDGE-BASED ECONOMY

Abstract. This article presents Kazakhstan's efforts to make science a basis for the growth of the national economy, as well as in this regard a vision of the RSE «Medical Center Hospital of President's Affairs Administration of the Republic of Kazakhstan" in the development of national science.

Keywords: scientific policy, knowledge-based economy.

Today the world lives in a period of profound and rapid changes, technological, economic and social - in the conditions of the Fourth Industrial Revolution. In his Message to people of Kazakhstan "New Opportunities for Development in the Conditions of the Fourth Industrial Revolution" of January 10, 2018, President of the Republic of Kazakhstan Nursultan Nazarbayev determines what is necessary, what the state must do to successfully advance the country in today's world [1]. Independence of Kazakhstan is 26 years old, for the past period, Kazakhstan has gone from a collapsed economy after the collapse of the USSR in 1991 to a leader in Central Asia. Today, Kazakhstan's GDP is 2 times more than the four Central Asian countries (Uzbekistan, Kyrgyzstan, Tajikistan and Turkmenistan). However, only a world-competitive economy can lead Kazakhstan to the number of 30 developed countries by 2050. Moreover, this is possible in the construction of a knowledge-based economy that involves the purposeful creation of effective technological solutions for the economy.

The science of Kazakhstan does not currently sound on international scientific platforms. Therefore, this article presents the efforts of our country undertaken to make science the basis for the growth of the national economy, as well as in this regard a vision of the RSE «Medical Center Hospital of President's Affairs Administration of the Republic of Kazakhstan" (hereafter - Hospital) in the development of national science.

The hospital comprises 30 clinical areas, more than 20,000 hospital patients and more than 300,000 outpatients per year, as well as more than 25,000 attached populations. This is more than 70 thousand square meters of space and medical equipment totaling nearly 19 billion tenge, about 2,000 employees providing medical assistance at the level of international standards, using unique diagnostic and therapeutic technologies for Kazakhstan, international accreditation of quality of medical care and patient safety, national accreditation for the right to perform scientific research, and testing drugs and medical products.

Advantages of the hospital, contributing to scientific development are interdisciplinarity, diversification, the availability of infrastructure and scientific personnel, and the existence of a unified development strategy [2]. The hospital has chosen a comprehensive approach to the management of scientific activities. The strategic approach allows the Hospital to overcome some of the obvious constraining factors in the development of national medical science. At the senior management level (director and his deputies), key processes are managed in the strategic plan for the development of the hospital. The strategic plan ensures the creation and maintenance of the internal environment of the

Hospital, facilitates the involvement of both staff in scientific activities and the patient, offering services that are more effective. No less significant is the process part that manages current processes at the personnel level through a short-term operational plan. Involvement of personnel through the distribution of responsibility and authority of personnel approved by the relevant regulations (job descriptions, plan of continuing education, motivation system, etc.) ensures the implementation of plan activities. In addition, the algorithm for monitoring scientific activity, based on the Deming cycle (plan - act - verify - act), contributes to continuous improvement [3].

External consumers of the results of scientific activity are patients, and internal - employees. A single strategy for the development of the Hospital, aimed at leadership in the market of medical services in Kazakhstan and the near abroad and financial independence, ensures the involvement of both internal (employees) and external consumers in obtaining the results of scientific activities for the benefit of both sides [4].

The healthcare system in Kazakhstan is dynamically developing in the market of medical services. Therefore, it is possible to ensure the improvement of medical assistance to the population and its own economic sustainability of the medical organization of the republican level only if the use of the achievements of fundamental science for the creation and introduction of new effective treatment and diagnostic technologies into medical practice. Thus, a successful modern medical organization, along with the process of providing medical assistance, develops a research process of a modern level of quality [5]. The growth of GDP, the economic efficiency of industrial enterprises are inextricably linked with the introduction of research achievements of national scientists and innovative technologies into production. Therefore, medicine, being a part of the country's economy, is also called upon to be science-intensive.

To achieve this goal, the country has created the necessary legislative and regulatory framework. Today, these 6 main legislative acts that are designed to ensure the development of science in the country are capable for creating a specific product that is significant for the country's development, from providing a priority for scientific products having a commercial perspective, creating conditions for the appropriate distribution of very limited public funds, scientific activity:

[1] Law of the Republic of Kazakhstan “On science”, 2011.

[2] Law of the Republic of Kazakhstan “On commercialization of results of scientific and (or) scientific and technical activities”, 2015: creation of conditions for the development of Kazakhstan science for the benefit of the economy and business.

[3] Law of the Republic of Kazakhstan “On state support of industrial and innovative activity”, 2012.

[4] Decree of the Government of the Republic of Kazakhstan of May 25, 2011 No. 575 “On Approval of the Rules for Basic, Grant, Program-Target Financing of Scientific and (or) Scientific and Technical Activities”.

[5] Decree of the Government of the Republic of Kazakhstan of May 13, 2011 No. 511 “On Approval of the list of organizations that are subjects of basic financing”.

[6] Decree of the Government of the Republic of Kazakhstan of June 20, 2011 No. 670 “On Approval of the norms of basic funding for scientific and (or) technical activities”.

[7] Decree of the Government of the Republic of Kazakhstan of August 1, 2011 No. 891 “On Approval of the rules of organization and conduct of the state scientific and technical expertise”.

Today in our country, the main purpose of science is to ensure a real contribution to the acceleration of diversification and the sustainable development of the country's economy. Sustainable means that at the level of the best international standards, in cooperation with foreign partners, the development of research activities that are able in cooperation with business to solve specific tasks for the country's economy. The "scientific idea - scientific and technical development - commercial product" stage is a necessary condition, fixed by legislation, for creating a knowledge-based economy in the country. Thus, the innovative development of the economy assumes the growth of qualitative indicators of science in the following areas: productive scientific and research activity, the real contribution of science to the economy, cooperation with business, integration with the foreign scientific community.

The long-term strategy for the development of science in Kazakhstan is set out in the State Program of the Development of Education and Science of the Republic of Kazakhstan for 2016-2019 [7]. How can the competitiveness of science ensure sustainable economic growth? The decision of four priority tasks ensure the achievement of the chosen goal through the key outcome indicators:

[8] to ensure a targeted increase in science in the development of the country's economy (KPI: share of business expenses in total research and development work, increase in the share of national patents); among the activities that contribute to this are special conditions for public and private partnership in planning and implementing scientific projects and scientific and technical programs;

[9] to strengthen the scientific potential of the status of a scientist (KPI: increase in the number of researchers, increase in publications in international journals, citation level of the total number of publications); among the activities that contribute to this - access to international databases of scientific and technical information is provided;

[10] to modernize the science infrastructure according to the purpose (KPI: coefficient of renewal of scientific equipment, the growth of innovative departments in scientific organizations); among the activities that contribute to this - the support of consortia that are able to take infrastructural decisions at an accelerated pace;

[11] to improve the management and monitoring of the development of science according to the purpose (KPI: growth in the effectiveness of scientific organizations, share of highly and medium-effective projects in the total number of applied research); among the activities that contribute to this - active and efficient commercialization offices.

A key issue for science is its funding, but unfortunately, in Kazakhstan in absolute terms, this is state funding [8]. The government's internal costs of research development are 14 times lower than OECD countries. Each scientist, developing and defending the right of his research for public funding, provides for appropriate representativeness of the research, validation of data, ensuring conditions for retransfer of its results, other conditions necessary for the recognition of results at the international level, in their own country. However, receiving financing in the amount of 10 times less than planned is forced to abandon all these conditions and receives a result interesting only for "junk" scientific journals, with a dubious level of evidence. From many scientific ideas, only a few are making progress in the development of society, how to find exactly the most productive idea? Therefore, only rational management, focused on the primary support of the scientific development of effective technological solutions for the economy, able to bring the goal closer. The structure and dynamics of costs in table 1 clearly show how this mechanism works: over the past three years, the share of financing of commercialization projects is increasing due to the share of grant projects for research, program-targeted and basic financing.

Table 1 - Financing of science (Ministry of Education and Science of the Republic of Kazakhstan)* in 2015-2017

Types of financing	Amount of financing, million dollars (the dollar rate from 03/03/2018, the National Bank of the Republic of Kazakhstan)		
	2015	2016	2017
Basic financing	7,10	8,38	7,08
Grant financing of scientific research works	52,04	42,67	32,98
Grant financing of projects of commercialization of results of scientific and technical activity	-	3,10	18,61
Program-targeted financing	38,08	34,75	28,37
Total	97,22	88,9	87,04

*Report of the Abdrasilova B.S., Chairman of the Committee of Science of the Ministry of Education and Science of the Republic of Kazakhstan, 2017.

Thus, three-level financing (basic, grant, program-target) contributes to the rational allocation of resources in the interests of a single goal - the development of science for the benefit of the economy and business. Moreover, there are incentives in the form of the State Award in the field of science and technology, nominal Ministry of Education and Science awards, state scientific scholarships for young and outstanding scientists.

The model of management of scientific infrastructure in Kazakhstan is represented by the interaction of several components. On the part of the state, this is primarily the highest scientific and technical commission under the Government of the Republic of Kazakhstan, coordinating scientific research of 8 ministries and agencies, as well as the Science Committee of the Ministry of Education and Science of the Republic of Kazakhstan, 392 scientific organizations and 25,000 scientific workers. On the part of

scientists, this is an independent examination of the National Center for State Scientific and Technical Expertise, collegial decision-making by the seven specialized scientific and technical councils.

What are the strengths of national science? There are not many of them yet. Nevertheless, a clear legislative framework developed in accordance with the unified strategy of the country's development, specific support for public and private partnerships, effective stimulation of the labor productivity of scientists, at least in the form of growth of the publication activity, the possibility of transferring scientific research technologies, and new opportunities in solving interdisciplinary tasks are a hindrance to progress. For the Hospital, these strengths are important and actively used in the development strategy for 2016-2019: the resources of the medical organization are fundamental for the development of the scientific backlog of future technologies demanded by medical practice, the publication activity of researchers is stimulated by the motivational component of labor remuneration, there are effective domestic and foreign partners in scientific research, the infrastructure necessary for scientific activity is created.

Unfortunately, there are much more weaknesses in the national science. This is a low level of state funding, and low motivation of scientists' work, as well as a significant gap between science and education, an insufficient level of management in science. However, each of these parties is deeply analyzed and has a specific roadmap for improving the situation. As an example, on the one hand, the growing activity of commercialization offices, designed to level the negative effect of insufficient scientific entrepreneurship, and on the other hand, to give missing skills to our scientific teams. Our Hospital is a partner of Nazarbayev University in joint scientific projects, which allows us to use the capabilities of their commercialization office. The purpose of the commercialization office is to support a scientific project that has a promising scientific result in commercialization. The office has a very simple procedure for registering an application: a written application of up to 15 sheets and a presentation at an office meeting. Then the stage of marketing expertise (no more than 1 month), then - independent expertise by 3 experts (2 months), if the project is considered promising, then it is taken for management, and this is the search for partners, financing, procurement, monitoring, patenting, management intellectual property, etc. The joint work of the scientific team with the commercialization office ensures the "scientific idea - scientific and technical development - a commercial product" stage, thereby creating real progress for a knowledge-based economy.

The independence of expert evaluation makes it possible to balance the influence of authorities in science, first, on the distribution of financial flows. There are two levels. First, an independent examination by the National Center for State Scientific and Technical Expertise, followed by collegial decision-making by the National Science Council. For medical science, this is the National Scientific Council "Science of Life and Health".

In 2018, the hospital recognizing itself as a participant in the historical period of transformation of medical science into a knowledge-based economy of Kazakhstan, will continue to implement scientific projects both independently and as part of interdisciplinary consortia with the National Laboratory Astana, Nazarbayev University, the National Center for Biotechnology, the International holding “Phytochemistry”, the Kazakh Academy of Nutrition, the Kazakh National Medical University named after S.D. Asfendiyarov, Karaganda State Medical University.

Conclusions

Scientific activity in Kazakhstan is carried out within the framework of a unified strategy for the national development based on a knowledge-based economy. A unified system for monitoring key performance indicators allows timely identification of problems in scientific activities and their overcoming. The project approach in the financing of scientific activities, the participation of independent experts, as well as collegial decision-making within the key areas of scientific activity makes it possible to ensure the objectivity and effectiveness of scientific activity in conditions of limited public financial resources. However, the subsequent practice of reducing the state funding of medical research several times from the calculated amount in most cases does not allow to bring the scientific idea to the development of technology, and technology - to a commercial product, especially, scientific organizations in the field of medicine have very limited access to other sources of funding. Nevertheless, the hospital, using all the opportunities available in the country for the development of medical science, intends to move forward, thereby strengthening its competitiveness in the domestic and international market of medical services.

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ҚАЗАҚСТАН РЕСПУБЛИКАСЫНДА ҒЫЛЫМИ САЯСАТ:
ҒЫЛЫМДЫ ҚАЖЕТСІНУ ЭКОНОМИКАСЫН ҚҰРУҒА БЕЙІМДЕЛУ

Аннотация. Бұл мақалада ғылымның ұлттық экономиканың өсуіне негіз болуы жөніндегі Қазақстанның күш-жігері көрсетілген. Сонымен қатар, осыған байланысты ұлттық ғылымның дамуына Қазақстан Республикасы Президенті Іс Басқармасы Медициналық орталығы Ауруханасының көрінісі берілген.

Түйін сөздер: ғылыми саясат, білімге негізделген экономика.

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НАУЧНАЯ ПОЛИТИКА В РЕСПУБЛИКЕ КАЗАХСТАН: ОРИЕНТАЦИЯ НА ПОСТРОЕНИЕ НАУКОЕМКОЙ ЭКОНОМИКИ

Аннотация. В данной статье представлены усилия Казахстана, предпринимаемые для того, чтобы наука стала основой для роста национальной экономики, а также видение в этой связи РГП «Больница Медицинского центра Управления Делами Президента Республики Казахстан» в развитии национальной науки.

Ключевые слова: научная политика, наукоемкая экономика.

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