Interaction of technology entrepreneurship and higher education as a factor in the innovative development of the region

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Abstract. The purpose of the study is to substantiate the strengthening of the role of scientific and educational institutions as centers for the formation of technological, managerial and innovative competencies in the formation of an innovation ecosystem, as an environment for the functioning of technological entrepreneurship. In the course of the work, it was revealed that the motivation of the entrepreneurial sector in funding scientific research of educational and scientific institutions should come to the fore. It has been substantiated that it is precisely the close interaction of business, educational and government structures that is the key to increasing investment and innovation activity in the region. The theoretical significance of the article is to substantiate the need to strengthen the role of educational institutions as centers for the formation of technological, managerial and innovative competencies in the formation of an innovation ecosystem, as an environment for the functioning of technological entrepreneurship.

1 Introduction

End of XX century characterized by the emergence of a new stage in the development of the leading countries of the world, a feature of which was the transition to the fifth technological order, the distinctive features of which are the active use of information and communication technologies, bio- and nanotechnologies, genetic engineering, renewable energy sources, which is quite naturally reflected in priority areas development of science and technology. Today the world economy is on the verge of the sixth technological order, the outlines of which are beginning to form in developed countries of the world, primarily in the USA, Japan and China, the vector of development and application of science-intensive, or so-called "smart technologies" becomes the system-forming signs of a new technological order [1].

In turn, the transition to a knowledge-based economy aggravates a number of problems of the world economy, among which, first of all, it is necessary to highlight the sustainable development of economic systems, the development and implementation of social innovations, the development and implementation of renewable energy sources, and much more. In this regard, the demand for information and knowledge-rich technologies and goods to meet the growing material and social needs is growing. All this determines the modern vector of development of human civilization in the forecasted future.

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2 Materials and methods

The main content of the study is an analysis of the activities of the Kalmyk State University, which received the status of a pivotal regional university, on the example of which it is shown what role educational structures can play in the formation of the innovation ecosystem of the region as an environment for the functioning of technological entrepreneurship. It is substantiated that it is the state that must create conditions in which it is entrepreneurship that will become not only the customer of qualified personnel with innovative, managerial and technological competencies, but also the customer of scientific research carried out by educational institutions.

3 (Results and Discussion)

Structural change in the determinants of the external and internal environment of economic systems as a result of scientific and technological progress leads to the dominance of the development of the technosphere, which acts as a set of artificial systems created by man [2]. The result of this development is the emergence of a qualitatively new type of founders of business, with fundamentally new technological, managerial and innovative competencies. It is economic entities with such competencies that become representatives of technological entrepreneurship [3].

One of the reasons for the rather low level of innovative activity of economic entities in the Russian economy is the low level of spread of technological entrepreneurship. At the same time, according to some estimates of researchers, during the first five years, most technology startups go bankrupt, while in 80% of the reasons for failures are problems of marketing and management, as well as capitalization of assets. Proceeding from the fact that it is the institutions of science and education that are the centers for the formation of technological, managerial and innovative competencies, it becomes necessary to clarify their role in the development of technological entrepreneurship.

There is generally no connection in the public mind between successful technological companies and higher education institutions. However, it is universities that are traditionally centers for generating innovations, it is there that the emergence and transfer of new knowledge takes place, and it is in universities that the greatest concentration of young people is observed, presenting demand for new technological, managerial and innovative competencies [4].

It is fair to note that research carried out in universities can be divided into the following types. First, it is fundamental research, which is deep in nature, which is the source of the formation of fundamentally new theories and directions of development of science and technology, and determines the directions of scientific and technological progress. Moreover, this type of research is extremely financially costly, requires unique equipment and highly qualified personnel, but does not bring profit. As a rule, this type of research is within the power of only highly developed countries, which can afford to finance basic science through sufficiently tangible budgetary expenditures. As a rule, large-scale fundamental research results in a number of narrower applied research areas that have broader opportunities for practical application. Thus, there is the formation of applied science, the results of which are easier to commercialize and are designed to create new products or services or create new properties of products and services required by the consumer. Moreover, it is natural that the period of applied development is much shorter and cheaper than the period of the corresponding fundamental research [5]. Thus, it is the fundamental developments that are the basis for applied science, the results of which are reflected in various types of technological entrepreneurship.

Regional economic systems as a consequence of the development of technological entrepreneurship on their territory receive a list of technologies, products and services characterized by a high level of competitiveness in the market. This accelerates the rate of economic growth in the region, changes the structure of the economy and increases the investment attractiveness of the territory. The experience of developed countries confirms that it is the level of development of technological entrepreneurship that is one of the most important indicators of the level of regional development [6]. Consequently, it is necessary to strengthen the role of universities in the development of technological entrepreneurship, and the state should create not only favorable conditions for innovative activities of universities, but also conditions for the commercialization of these innovations [7].

In modern conditions, the creation of a system of flagship universities in Russia presupposes positioning them as the cores of the region's innovation ecosystems [8]. For example, in the Republic of Kalmykia, the only institution of education and science on the territory is becoming one of the most important drivers of the socio-economic development of the region. At the same time, it should be noted that in these conditions regional universities are faced not only with the task of providing high-quality educational services and research activities, but also independently attracting investors to finance these activities. The consequence of this situation is that a regional university has to become not only a university for students, but also an entrepreneurial university in order to obtain an opportunity to finance the research activities. In this regard, it is the development of technological entrepreneurship on the basis of the university that opens up wide opportunities for educational and scientific institutions to attract resources to finance scientific research and more active interaction with the regional community.

Today, after receiving the status of a reference regional university, Kalmyk State University plays a major role in the formation of a regional innovation ecosystem. The higher educational institution of the Republic of Kalmykia is the central research site of the territory and is focused on the formation of priority areas for the socio-economic development of the region.

Kalmyk University has strong friendly relations with the Innovation Support Fund, within the framework of which KalmSU acts as the main platform for competitions within the framework of the "U.M.N.I.K." and "START", the annual forum "Innovative Kalmykia", which are the centers of attraction for the best innovative projects in the south of the country. Also, innovative activity at KalmSU is represented by a network of small innovative enterprises, which are a clear example of the development of technological entrepreneurship on the basis of an educational institution.

It is innovation and entrepreneurial activity that is becoming a promising direction for the development of the university in modern conditions. As the tasks of the implementation of this direction, it should be noted the formation of the innovation ecosystem of the region, stimulation of the development of technological entrepreneurship, support of innovative activities, search and development of talented youth as the basis of the human potential of technological entrepreneurship, formation of technological, managerial and innovative competencies of future entrepreneurs.

The studies carried out indicate that modern Russian share of universities acting as partners in technological entrepreneurship is extremely small. [9]. At the same time, as international experience shows, in highly developed countries, the level of interaction between technological entrepreneurship and higher educational institutions is much higher. The following mutually beneficial reasons for such a high level of cooperation between technological business and universities in world practice can be distinguished:

- 1) universities are the main subject of the supply of qualified personnel for the labor market, while the peculiarity of the new federal state educational standards is that it is the request of employers that determines the profile of training areas;

2) educational institutions are a source of new scientific research and innovative developments;

3) universities are the basic platform for creating technology startups.

Thus, mutually beneficial cooperation between business and educational structures can bring significant social, cultural and financial results for both parties. Businesses will benefit from the supply of skilled workforce and applied university research. Educational and scientific institutions can act as producers of knowledge commercialized through technology entrepreneurship, which will help build the capacity of resources for further research funding. Thus, it is precisely the close successful interaction of business and higher educational institutions that will accelerate the socio-economic development of the territory. World experience testifies that in modern conditions it is becoming an important factor of success to build up regional interaction between education and business.

However, it is the trust between potential partners that becomes the main problem in the development of cooperation between universities and business. This is clearly seen in the modern relations between educational and business structures. The asymmetry of information about research conducted within the higher educational institutions leads to a mismatch between supply and demand in the market for technological innovations, which then results in a low level of commercialization of scientific and technical developments and a low level of patenting [10].

An insufficiently high level of cooperation between business and educational institutions, which is reflected in the insufficient level of development of technological entrepreneurship, can be called as a factor that inhibits development on the technological development of Russia. The reluctance of business structures to invest in research in universities leads to a slowdown in research growth and an increase in demand for public investment. At the same time, the effect of state funding for scientific research is usually lower than the effect of commercial funding. There are many examples in the world when there were the startups that emerged on the basis of an educational institution that, over time, were transformed into successful large businesses. It is the high-quality cooperation of business and educational structures in modern conditions that becomes the key to the socio-economic development of the territory. At the same time, it is the enterprises that are actively involved in cooperation with educational institutions that are the first to gain access to technologies for the production of unique intellectual products and services.

4 Conclusions

The effective promotion of innovation and the achievement of technological leadership can only be built on the basis of close cooperation between educational and business structures. The state should play a key role in this process, but funding of scientific activities from the state budget alone is not enough. The state must create conditions in which it is entrepreneurship that will become not only the customer of qualified personnel with innovative, managerial and technological competencies, but also the customer of scientific research carried out by educational institutions. Therefore, the motivation of business structures in investments in scientific research of educational institutions comes to the fore. Here the state can use such instruments of state incentives as state guarantees and orders, as well as measures to improve the social status of research activities of universities with the aim of innovative development of territories.

As for the regions, here the regional innovation policy should come to the fore, the purpose of which should be the formation of an effective innovation ecosystem that will promote the spread and successful functioning of technological entrepreneurship. In particular, the Kalmyk State University today can become the platform on which the interaction of the scientific and entrepreneurial potentials of the region will take place so that they produce

unique intellectual goods and services and contribute to an increase in the general level of well-being of the region.

In this regard, the main goal of the regional policy to stimulate innovation is to create favorable conditions for the development of technological entrepreneurship on the basis of the university and through the private investment. The positive consequences of such a policy will be an increase in the competitiveness of local goods and services, an increase in the number of jobs created, an increase in the investment attractiveness of the territory and, as a consequence, the solution of many socio-economic problems of regional development. Fundamental is the creation of the necessary institutional environment for the implementation of innovative activities, which implies the creation of an appropriate regulatory legal framework, the development of targeted programs, the creation of a system of grant support and much more. The main tasks of regional target programs should include stimulating interaction between subjects of supply and demand for research activities, dissemination of best practices for creating innovative products, and developing a general strategy for innovative processes in the region.

At the same time, with a lack of its own resources for regional and federal funding of scientific research, the state must create conditions under which the entrepreneurial structures would benefit from participation in the innovation processes taking place in the universities. It is precisely the close interaction of business, educational and government structures that will be the key to increasing investment and innovation activity in the region. Another priority area for the development of technological entrepreneurship at the regional level is the creation and development of a technological platform, in which the efforts of entrepreneurial, educational and government structures will be consolidated. It is possible to implement this direction within the framework of the cluster approach by creating and developing a technological cluster, the directions of activity of which will determine the vectors of development of priority sectors and complexes of the region's economy. Kalmyk University in the status of a reference regional university can become a key participant in the technological cluster of the Republic of Kalmykia, solving the problems of reproducing the intellectual potential of the region and its effective use in innovation. The result of the creation of a technological cluster can be the formation of an effective innovation ecosystem in the region, an increase in the investment attractiveness of the territory, a decrease in educational migration, an increase in regional and local budget revenues, and much more.

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