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Research on the Role of Diversified Innovation and Entrepreneurship System in Promoting the Transformation of Scientific and Technological Achievements

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Abstract: *As a global hot spot, innovation and entrepreneurship is an important source of economic growth in various countries. With the implementation of the strategy of comprehensively deepening reform and expanding the development of opening up and innovation, China's innovation and entrepreneurship ecosystem has been continuously improved and optimized. However, compared with developed countries, there is still a big gap in China. It is urgent to strengthen the integration and interactive development of diversified innovation and entrepreneurship systems to promote the transformation of scientific and technological achievements in the region. This paper summarizes the current situation of the transformation of scientific and technological achievements by the innovation and entrepreneurship system, analyzes the main problems existing in the transformation of scientific and technological achievements in the diversified innovation and entrepreneurship system, and explores countermeasures and suggestions to strengthen the integration and interactive development of the diversified innovation and entrepreneurship system to promote the transformation of scientific and technological achievements in Dalian.*

Keywords: *diversification; innovation and entrepreneurship system; integration and interaction; transformation of results*

1. Introduction

Innovation has always been an important force for the development of a country and a nation. Science and technology are the foundation of a strong country. Scientific and technological innovation is the foundation of a country's prosperity. The competition between countries is ultimately the competition of science and technology. Under the rapid development of the scientific and technological revolution, how to successfully transform scientific and technological achievements into productivity is the key point of science and technology to promote the high-quality development of the economy, and it is also the fundamental way to adjust the national economic structure [1]. In the scientific and technological innovation chain, the innovation and entrepreneurship system is the key link between scientific and technological research and development and industrialization promotion. The integration of the diversified innovation and entrepreneurship system can break through the "shackles" of the institutional arrangement and policy system,and the creativity of scientific and technological talent resources can be given full play to. And the services, such as scientific and technological innovation policies, training, research and development and transformation, can be provided through establishing an industry-university-research cooperation chain, so enterprises are efficiently incubated, the industrialization of scientific and technological achievements is realized, and the regional industrial cluster effect is promoted [2]. As an important part of the national technological innovation system, the innovation and entrepreneurship system represented by science and technology enterprise incubators has become an important force to promote scientific and technological innovation and achievement transformation, which is of great strategic significance.

2. Research status

2.1. International status

The innovation and entrepreneurship system was born with the rise and development of the new

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technology industry revolution. In 1959, the United States first proposed the concept of incubator and established the world's first enterprise "incubator". Subsequently, the incubator was widely recognized and quickly promoted in Europe and the United States. The United States is not only the birthplace of incubators, but also the place with the most incubators. It is also the most successful and integrated country in the world. In the mid-to-late 1980s, the American "incubator" entered a stage of rapid development. By the 1990s, the American incubator business was booming. The original U.S. incubator was mainly established by government investment to alleviate the high unemployment rate, providing places and infrastructure, and acting on behalf of some government functions. With the development of the economy and the need for the work function of the incubator, the American incubator is now basically operating as a start-up enterprise. It is a legal entity that operates independently and bears its own profits and loss, and it operates standardizes in accordance with market principles and has a clear organizational structure and an efficient operation mechanism.

In the 1990s, Israel successfully achieved economic transformation, established a country with science and technology, and turned into a first-class high-tech economic country. The Israeli government has set up an innovation administrative agency. Colleges and universities are responsible for innovative science and technology, and enterprises ensure application research and development and technology transfer, thus forming an efficient national scientific and technological innovation system. In this system, innovation and entrepreneurship systems such as incubators have played an immeasurable role in the development of Israeli science and technology enterprises, which are the basis for ensuring Israel's scientific and technological innovation competitiveness [3]. The Israeli incubator is an independent, non-profit legal entity. It receives financial support from the government every year and has a clear relationship of responsibility, intellectual property rights and project screening mechanism to ensure the healthy and continuous operation of the incubator. As a bridge between academia and industry, the innovation and entrepreneurship system connects the mature and efficient commercialization system of scientific research achievements, and its role cannot be ignored [4]. The Israeli government has adopted a series of policies and measures to promote policies, bills and plans for scientific and technological innovation, and create a good business environment, so as to enhance the power of scientific and technological innovation in colleges and universities and the innovation vitality of enterprises, and guide the development of national high-tech technology and industrialization, making it the main driving force of national economic development [5, 6]. Israel's relatively complete scientific and technological innovation system can provide experience for the formulation and implementation of China's scientific and technological innovation, transformation model, scientific and technological cooperation and other strategies.

2.2. Current situation in China

The innovation and entrepreneurship system was born under the background of China's vigorous promotion of national entrepreneurship. China began its research on incubators in 1984. In June 1987, China's first "incubator" (Wuhan East Lake New Technology Entrepreneurship Center) was established in Wuhan. Subsequently, the concept of "incubator" was quickly valued and promoted all over the country, and incubators were set up in Beijing, Shanghai, Tianjin, Xi'an, Chengdu, Harbin, Nanjing and other cities. Unlike other countries, most of China's incubators are science and technology business incubators, which have received strong support from the central and local governments. They have developed rapidly. In terms of the quantity and quality of science and technology business incubators, China has played a leading position in the world, and the incubator has played an important role in China's economic development, and have cultivated a number of scientific and technological enterprises [7].

With the implementation of the strategy of comprehensively deepening reform and continuing to expand the development of opening up and innovation, China has ushered strategic opportunities like technology, talents, capital and other innovation elements in the adjustment period of the world's scientific and technological innovation pattern. The innovation and entrepreneurship service infrastructure and market environment have been greatly improved, and the innovation and entrepreneurship ecosystem has been continuously improved and optimized [8]. Since the beginning of the 21st century, the wave of innovation and entrepreneurship in China has entered a new stage. With the popularization of the Internet, Internet technology has been continuously upgraded, the model of innovation 2.0 has formed, and the revolutionary changes in the main body of innovation have occurred. Mass innovation has become a new innovation model. The paradigms and methods of encouraging innovation and entrepreneurship are constantly updated. Entrepreneurship activities have increasingly become the source of innovative economic development. University science parks, entrepreneurship

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parks, incubators, high-tech zones and mass creation spaces are showing a vigorous trend.

2.3. Current situation in Dalian

In recent years, Dalian has issued a series of policies to promote entrepreneurship and innovation. It comprehensively uses tax and fee concessions, financial subsidies, loan discounts, venture capital funds and other policy means to promote the implementation of five policy documents such as *The Several Provisions of Dalian on Supporting High-level Talents for Innovation and Entrepreneurship*, and it makes overall arrangements for funds to support high-level talents' and high-skilled talents' innovation and starting businesses, to create a new engine for development and enhance the new driving force for development. At the same time, in response to "mass entrepreneurship and innovation", Dalian has successively issued *Implementation Opinions of Dalian Municipal People's Government on Accelerating the Construction of a Support Platform for "Mass Entrepreneurship and Innovation"*, *Implementation Measures for Dalian to Promote "Mass Entrepreneurship and Innovation" to Promote the Sustainable and Healthy Development of Venture Capital*, *Measures of Incentives and Subsidies for Speeding up the Construction of a Double Innovation Support Platform to Promote "Mass Entrepreneurship and Innovation" in Dalian*, and *Measures of Incentives and Subsidies for Launching Deep Thematic Activities to Promote "Mass Entrepreneurship and Innovation" in Dalian*. The purpose is to highlight the important carrier role of the platform in promoting the work of double innovation and provide diversified ways and broad space for the public to participate in innovation and starting businesses, so as to help entrepreneurship incubation platforms to provide social and professional services for entrepreneurial talents, widely carry out entrepreneurship and innovation activities with distinctive characteristics, brand effects and leading role for the society, then a great atmosphere of entrepreneurship and innovation can be created.

At present, there are many forms of innovation and entrepreneurship system in Dalian, mainly including high-tech industrial zones, free trade zones, university science parks, science and technology enterprise incubators, mass creation spaces, etc., to provide corresponding innovation and entrepreneurship service content and support methods for creators in society. At the same time, colleges and universities in Dalian have also established innovation and entrepreneurship systems, such as the School of Innovation and Entrepreneurship of Dalian University of Technology, the School of Innovation and Entrepreneurship Education of Dalian Jiaotong University, the Innovation and Entrepreneurship Education Base of Dalian Medical University, the School of Innovation and Entrepreneurship of Dalian Neusoft University of Information, the College Student Innovation and Entrepreneurship Education Center of Dalian Minzu University, etc.. They are mainly to cultivate the innovation and entrepreneurship ability and innovation and entrepreneurship thinking of universities. In terms of quantity, Dalian's innovation and entrepreneurship system has a large number of varieties and staggered functions, which has not formed a diversified, perfect, systematic and characteristic innovation and entrepreneurship system chain.

3. The main problems

Over the years, the achievements in the development of China's innovation and entrepreneurship system are unquestionable and obvious to all. However, compared with developed countries, China's innovation and entrepreneurship system is still in its infancy, and the incubation support services of the scientific and technological innovation and entrepreneurship system need to be improved urgently, and there exist shortcomings. Therefore, the construction of the innovation and entrepreneurship system should be strengthened, and professional technical services and policy guidance, as well as low-cost, convenient and all-element open comprehensive services, should be provided for entrepreneurs, and it is particularly important to create an efficient public service carrier for innovation and entrepreneurship.

3.1. Issues of entrepreneurship policy

At present, among the many support policies for innovation and entrepreneurship formulated by the government in light of local conditions, the systematic, targeted and operable nature of some policies are not practical enough, and there are problems such as insufficient supporting service systems and lack of corresponding regulatory systems in the process of implementation. Some of the support policies formulated have a relatively single direction of support, and the support is far from enough. The preferential policies have not been implemented, and the support policies have not been effective.

ISSN 2616-7433 Vol. 6, Issue 1: 124-129, DOI: 10.25236/FSST.2024.060121

3.2. Problems of entrepreneurial projects

Due to the differences in the majors and backgrounds of entrepreneurs, the field direction of the entrepreneurial projects they choose is also different. At present, most of China's entrepreneurs have a background of management discipline and no technical background. Most of their entrepreneurial projects focus on network information and software services. Although they have a certain scale of entrepreneurial teams and a large number of people, they lack professional teams in technical maintenance and relevant information technology fields. And there is no characteristic advantages in technological innovation. In the face of constantly updated network technology problems, the entrepreneurial team lacks the ability to break through technical barriers, resulting in the lack of vitality of entrepreneurial enterprises.

3.3. Issues of venture capital

For entrepreneurship, the start-up capital of the project is indispensable, and sufficient start-up capital is a prerequisite for ensuring innovation and entrepreneurship activities. After investigation, the shortage of venture capital has now become the primary problem restricting entrepreneurs. Most entrepreneurs' start-up funds rely on government support funds, and the source of funds is relatively single. However, the government's support funds can only be a drop in the bucket for most entrepreneurs, and there are a large number of entrepreneurs applying for government support funds, but the amount of support funds is very limited, which cannot meet the capital needs of many entrepreneurs. The lack of entrepreneurial funds has become a barrier to the development of innovation and entrepreneurship.

3.4. Issues of entrepreneurial environment

Affected by conservative concepts and exam-oriented education for a long time, China has formed an inherent conceptual thinking and public opinion orientation. The cultural atmosphere of innovation and entrepreneurship in the whole society is weak, and the educational concept of innovation and entrepreneurship has been ignored for a long time. Most people lack the ideological awareness of independent innovation and entrepreneurship, and most families still expect their children to work in government departments, public institutions or stable units, and they do not support their children to start their own business. They believe that the road to start a business is difficult, the risk is high, the return is low, the social status is low, and the work is not decent. These conservative concepts that they are content with the status quo, sit back, looks before and after and worry about gains and losses directly suppress the passion and confidence in innovation and entrepreneurship, and limit the cultivation of entrepreneurial awareness and the establishment of entrepreneurial ideals, so as to drive people far away from starting a business.

3.5. Entrepreneurs' own problems

China has long been influenced by traditional culture and the thoughts of stability and moderation in family education. Although it has high cultural literacy and strong learning ability, most colleges and universities have not established an entrepreneurial education system, let alone integrated entrepreneurship awareness and entrepreneurial spirit into the whole education and teaching practice, due to the relative limitations of traditional education. The school attaches great importance to students' ability to master knowledge, and despises students' practical application, innovation and integration of knowledge. At the same time, most teachers have no entrepreneurial experience and lack enterprise management experience. Therefore, entrepreneurs do not gain substantive guidance for their entrepreneurship from the school and teachers during the school period, resulting in the lack of consciousness and weak ability in innovation and entrepreneurship.

4. The countermeasures

4.1. Establishing a perfect service mechanism

With the development of the market economy, innovative enterprises, especially small start-ups, pay more and more attention to adding new different elements or even new enterprise service concepts to their existing enterprise service fields and service content, so as to enhance the product advantages of

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enterprises and create greater economic value. It is suggested that Dalian should improve the setting of various elements within the system through various measures. Through the construction of reasonable mechanisms, the diversified elements of innovation and entrepreneurship in the society can be effectively gathered, effectively avoiding the waste of resources and providing more scientific and technological connotation services for innovation and entrepreneurship. Entrepreneurs are given supports in terms of basic office facilities, preferential supportive policies for innovation and entrepreneurship, etc., so as to reduce the cost of trial and error and risk of entrepreneurs, entrepreneurial teams and entrepreneurial enterprises. At the same time, we should pay attention to the role of diversified innovative and entrepreneurship-related service institutions. While improving the convenience of work and life through the product or service content of start-up enterprises, we should find an operation mode suitable for the sustainable and benign development of start-up enterprises, and build a green production and development mode.

4.2. Continuously improving the content of innovative and entrepreneurial services

With the rapid development of technology and the increasing activity of entrepreneurship, the service system has gradually become a strategic resource for development. The innovative and entrepreneurial services provided by entrepreneurs and start-ups are more and more abundant, and the quality requirements for services are getting higher and higher. It is suggested that Dalian further improve the work content of innovation and entrepreneurship-related service institutions, diversify and integrate interactive development, continuously improve the business level of Dalian's innovation and entrepreneurship service institutions, and establish a diversified, multi-level, multi-dimensional and multi-channel innovation and entrepreneurship support service system to provide a full range of follow-up guidance and technical services for entrepreneurs and start-ups. A multi-type and wide-coverage innovation and entrepreneurship service platform should be established, and relevant innovation and entrepreneurship resources and information should be integrated, and entrepreneurship incubation services, such as technical consulting services, investment and financing professional services, and entrepreneurship exchange and training services, should be provided for entrepreneurs and start-ups.

4.3. Broadening the financing channels of start-ups from multiple angles

The whole society jointly creates a good environment for innovation and entrepreneurship, and builds a social ideology, concept and cultural atmosphere conducive to innovation and entrepreneurship. It is suggested that Dalian should make full use of the relevant resources and platforms of news media, mainly to vigorously publicize the preferential supportive policies for innovation and entrepreneurship, the entrepreneurial spirit of entrepreneurs, and typical entrepreneurial stories, giving full play to the role of models around them, so that people's enthusiasm is stimulated for innovation and entrepreneurship and social resources are encouraged to actively enter into activities related to innovation. And the combination of innovation and entrepreneurship system and financial system should further guided to improve the entrepreneurship investment and financing system. And science and technology financial services should be constantly innovated and a venture capital system based on science and technology investment and financing should be further standardized and established, so so to improve the evaluation system and venture capital operation procedures. And the investment and financing model should be gradually improved, and bank funds should be transformed into a strong support for scientific and technological innovation and the industrialization of achievements. And a capital market that is beneficial to regional innovation and entrepreneurship development should be gradually formed, and a multi-level and standardized financing platform should be built, and a new pattern of diversification of scientific and technological investment should be established, so as to promote national innovation and entrepreneurship.

5. Conclusion

With the promotion of the knowledge economy, the competition between countries focuses more on the level of innovation and entrepreneurship. Dalian is located in the old industrial base in Northeast China, and its economic development is in a critical period of "rolling stone climbing". Scientific and technological innovation is a new momentum and generating point for revitalizing local development. We should vigorously implement the innovation-driven development strategy, continuously develop and strengthen the scientific and technological innovation and entrepreneurship system, strengthen the

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integration and interactive development of the diversified innovation and entrepreneurship system, enrich the diversified connotation of the innovation and entrepreneurship system, improve the service mechanism of the innovation and entrepreneurship system, promote scientific and technological innovation and the transformation of scientific and technological achievements, making it the internal driving force of local economic development, so as to promote the high-quality development of the local economy in Dalian.

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