

Thoughts on Science and Technology Innovation of High-level Application-oriented University

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Abstract

High-level application-oriented universities should be positioned to serve the local economic and social development, and should be based on local areas and solve the practical problems of enterprises and industries. Strategic positioning around Beijing city and Beijing city master plan, North China University of Technology (NCUT) based in Beijing, facing the whole country, look around the world, strive to build a have important influence both at home and abroad, characteristic, advantage prominent university of high level industry, continue to Beijing construction harmonious international first-class livable city and global influence of science and technology innovation center to provide talent guarantee and intellectual support.

Keywords

High-level application-oriented university, science and technology innovation.

1. Introduction

Since the 18th CPC National Congress, General Secretary Xi Jinping has attached great importance to scientific and technological innovation. He has put forward a series of important ideas and fully expounded them on implementing the innovation-driven development strategy and accelerating all-round innovation with scientific and technological innovation at its core. This has played an important spiritual leading role for Chinese universities and scientific and technological circles to concentrate on improving social productivity and overall national strength through scientific and technological innovation. As the main body of universities in China, how to give full play to the due function of scientific and technological innovation based on their own characteristics is worth our deep thinking.

2. Technological innovation and university mission

2.1. The role of scientific and technological innovation in China's overall development

The development of science and technology has a bearing on China's overall development and is a key force for future international competition and national prosperity. At present, China's strategic goal of building a world scientific and technological power is to rank among innovative countries by 2020, to rank in the forefront of innovative countries by 2030, and to develop into a world scientific and technological power by the centenary of the founding of the People's Republic of China. Therefore, the level of lasting, in-depth and cutting-edge scientific and technological innovation is the core index to measure the development of China's future scientific and technological strategy. Scientific and technological innovation has the highest strategic significance for national and social development. It can be said that the prosperity of science and technology leads to the prosperity of the nation, and a strong science and technology leads to a strong country.

The history of human development is a history of science and technology. Scientific and technological revolutions can often profoundly change the pattern of world development. Some countries have seized the opportunity of the scientific and technological revolution and achieved rapid growth in their economic strength and overall national strength, thus changing their destiny. This is a valuable experience of human history. The scientific development in the world at the beginning of the 21st century has proved that the fourth industrial revolution with artificial intelligence, clean energy, robot technology and quantum information technology has arrived, which is an important strategic opportunity for China to overtake on curves, and also a rare opportunity for the strategic development of Chinese universities, especially applied universities.

2.2. The position and function of universities in innovation-driven development strategy

Colleges and universities are the main front of technological innovation and development. Focus on cultivating innovative, compound and applied talents. This profound discussion has clarified the position and role of universities in the innovation-driven development strategy and put forward clear requirements for the reform and development of universities in the new era. In this case, colleges and universities should increase basic research, actively participate in scientific and technological breakthroughs, and continuously provide original innovation and application innovation; At the same time, it is the responsibility of colleges and universities in the new era to train innovative talents and enhance the supply of scientific and technological innovation talents.

Scientific and technological innovation includes original scientific thought and technological innovation. For Chinese universities, especially applied universities, scientific and technological innovation is the natural mission. The development of original scientific ideas -- the kind of source-driven innovation that is sustainable and original -- will depend largely on high research universities. Technological innovation, namely production technology innovation, is the application of technology based on original scientific ideas and the application of new technology innovation. In this field, high-level applied universities should be the main force. If water is used as a metaphor, scientific thought is the source of water, providing ideas and methods, while technological innovation is the flow of water, applying scientific thought to the market and creating industry and value. In scientific development, both source and flow are indispensable, and they complement each other. Colleges and universities should recognize the trend of scientific and technological development, conform to the national and local economic development trend, actively recognize the change, take the initiative, seek scientific change, strive for strategic initiative, grasp the development opportunity, so as to give play to the important role of applied university in scientific and technological innovation.

3. Understanding of science and technology innovation in applied University

3.1. Positioning and function of high-level application-oriented university

The Classified Development Plan of Beijing Municipal Public Universities divides Beijing municipal universities into three types: high-level research universities, high-level characteristic universities and high-level applied universities, and scientifically defines and interprets the positioning, objectives and functions of Beijing municipal universities.

High-level research universities vigorously carry out frontier research, basic research and applied basic research, proactively undertake major research tasks of the state, Beijing municipality and enterprises, and actively promote the commercialization and application of research achievements. High-level universities with distinctive features will further promote

basic and applied research, carry out research in key areas, and solve problems in the development of industries and industries. High-level application-oriented universities closely combine with the economic and social development needs of Beijing to carry out high-relevance theoretical exploration and scientific and technological innovation.

In short, if high-level research universities and high-level characteristic universities mainly undertake frontier research and basic research tasks, high-level applied universities should play their main advantages in scientific and technological innovation, such as applied research, applied basic research and achievement transformation. This is a scientific choice to make clear the orientation of high-level application-oriented universities and the orientation of talents training, and to give full play to the advantages of classification.

3.2. Scientific and technological innovation function of high-level applied university

Application-oriented universities aim at cultivating application-oriented talents suitable for economic and social development. The applied university is not an academic level, but a type of university, or a kind of university that is different from and overlapping with the research university. It is not in accordance with scientific laws or facts to completely separate research and applied universities. For application-oriented universities, to improve the teaching level and talent training quality, it is necessary to constantly innovate, and the key to realize innovation lies in scientific research, which plays a key role in improving the running level of application-oriented universities. High-level application-oriented universities should hold high the banner of applied research, clearly encourage the development of applied research, start from practical problems, highlight application, meet the needs of local, industrial and enterprise, and take applied technology research, technology integration, technology innovation as the main positioning.

High-level application-oriented universities must have practical application-oriented scientific research. The main battlefield should undoubtedly be applied research centering on local industrial development, and more efforts should be made in the research and development of applied technology combined with the actual application and transformation of scientific and technological achievements, so as to enhance the core competitiveness of the university. On this basis, basic research and applied research should be coordinated. Applied or basic research should be supported as long as it is problem-oriented and supports local, industrial and corporate development.

High-level application-oriented universities should be positioned to serve the local economic and social development, based on the local, to solve the practical problems of enterprises and industries. Through these high-quality applied research work, colleges and universities can establish good cooperation with government departments, enterprises and institutions, improve their regional popularity, expand their social reputation in the region, and create good external conditions for their own development. If the construction of applied universities in Beijing wants to adapt to the social development of the capital and the requirements of the construction of "four centers", it is necessary to do a good job in the research and development of applied technologies and the transformation of scientific and technological achievements combined with reality, so as to better serve the social development of the capital.

4. Thoughts on scientific and technological innovation in colleges and universities

Strategic positioning around Beijing city and Beijing city master plan, NCUT based in Beijing, facing the whole country, look around the world, strive to build a have important influence both at home and abroad, characteristic, advantage prominent university of high level industry,

continue to Beijing construction harmonious international first-class livable city and global influence of science and technology innovation center to provide talent guarantee and intellectual support.

At present, according to the deployment of Beijing, as a high-level applied university in the capital, NCUT should closely combine with the needs of Beijing's economic and social development to carry out high-relevance theoretical exploration and scientific and technological innovation. The school should find its own orientation, serve the needs of the country, the industry and the capital, and serve the needs of students' growth and development, as the basic starting point of school running, highlight the advantages of school running, form a mismatch development, better serve the national major strategy, and serve the construction of "four centers" in Beijing. Based on this, NCUT has formed a perfect scientific and technological innovation system through scientific analysis and active exploration, namely, one focus, two towards, eight directions, five indicators, four handles and two supports.

4.1. One focus

According to the Beijing city function orientation, applied university should be closely combined with Beijing's economic and social development needs and national science and technology innovation center construction and development needs, around the Beijing urban construction, operation, management and service of the actual demand and prominent problems, focusing on the city's infrastructure, public security, urban disaster prevention and mitigation, traffic jams, air pollution, such as "big city disease", carry out targeted scientific research, enhance the awareness of serving the modernization of Beijing's urban governance system and governance capacity, improve the resilience of the city, and improve the level of urban fine governance and precision services.

NCUT is making concerted efforts to build an intelligent livable society based on the urban needs of Beijing and to do a good job in "intelligent" articles. Focusing on the needs of people's livelihood, such as education, medical care and elderly care, the university is accelerating the innovative application of ARTIFICIAL intelligence, improving the intelligence level of people's livelihood services, and providing personalized, diversified, professional, precise and high-quality services to the public. We will promote the application of AI technology in urban governance, including traffic management, environmental protection, public security and emergency response command, build demonstration zones for an intelligent society, and help build a governance system for megacities.

4.2. Two towards

It is the basic service direction of NCUT based on long-term development to meet major demand and practical application. To meet the major needs of building a science and technology innovation center in Beijing's overall urban planning, THE university gives full play to the advantages of rich science and technology resources, constantly improves its independent innovation ability, grabs the commanding heights of science and technology in the strategic high-tech field, and builds a new highland of science and technology development in Beijing.

In response to Beijing's great need to speed up scientific and technological innovation and build a "sophisticated" economic structure, NCUT strives to make breakthroughs in key core technologies and acquire a batch of internationally leading technologies with independent intellectual property rights in frontier fields such as big data, artificial intelligence algorithms, public security and emergency management.

We will comprehensively improve the level of urban governance and establish a governance system for megacities. We will focus on major issues restricting the sustainable development of the Capital and on difficult and hot issues of public concern. We will make breakthroughs in addressing "big-city diseases" such as overpopulation, traffic congestion and air pollution, and

take technical support as a means to address both the symptoms and root causes of the problems.

An all-weather, systematic and modern urban operation security system will be formed. To improve the public security system, enhance the ability of urban security. We will strengthen risk management in all areas of public security and in cities with major events, strengthen our ability to withstand natural disasters, respond to emergencies and manage crises, and strive to increase the resilience of cities.

To realize the intelligent and safe operation of Beijing. It serves for the safe operation of Beijing megacity, for the safety monitoring of water, electricity, gas, heat and transportation, as well as the energy and environmental protection, public safety and emergency response of the capital, and forms the urban governance capacity matching the world-class harmonious and livable capital.

4.3. Eight directions

After years of development, the university's dominant disciplines focus on intelligent information technology and intelligent control, intelligent manufacturing and intelligent construction, and urban risk prevention and control and comprehensive management. Around the three characteristic discipline, the school carefully extracted 8 characteristic research direction: content of the general assembly data platform key technology, the collaborative perception and intelligent interactive technology, intelligent transportation technology and system, intelligent control and intelligent systems, intelligent manufacturing and intelligent equipment, intelligent building and building energy conservation, urban risk prevention and emergency management, urban comprehensive governance and intelligence services.

The purpose of the characteristic research direction is to form a new generation of information technology and urban system engineering discipline group. School scientific research will serve Beijing city high-tech industrial structure, a new generation of information technology, software and information service industry, artificial intelligence, intelligent equipment, new materials, energy conservation and environmental protection, etc., in the service of Beijing urban construction operation management, urban planning and design construction, city water, electricity, gas, heat, transportation, urban modernization management, energy saving, environment protection, etc.

Taking urban risk prevention and emergency management of schools as an example, this study focuses on urban public security, developing risk assessment and prevention and control, emergency response and management systems in public health, urban management, transportation and other fields, and constructing related monitoring, early warning and emergency management systems and big data platforms. Through the research in this direction, the construction of functional platforms and capacity systems such as data management, data application, data operation and maintenance, and data evaluation will be realized, and the data chain of urban safe operation will be improved, providing technical support for the construction, security and stability of Beijing smart city.

4.4. Four grippers

4.4.1. University-enterprise cooperation

Over the years, the university has been committed to promoting school-enterprise cooperation and industry-university cooperation. Guided by industrial demand and technological innovation, the university has set up joint research projects, carried out extensive technical cooperation, jointly carried out technological research and development and subject tackling, and cultivated high-quality talents and research teams, striving to create a model of "industry-university" win-win development.

4.4.2. Civil-military integration

The important content of science and technology development in colleges and universities is military-civilian integration. At present, the university has formed a consensus, closely follow the needs of the army, select the direction of scientific research, integrate resources inside and outside the university to establish scientific research team, develop excellent scientific research development mode and talent training mode driven by projects, and build a science and technology transformation platform of "national urgent need, military-civilian integration, and strong cooperation".

4.4.3. Medical engineering combination

The scientific research team of the university early noticed the cooperation between scientific and technological innovation and medical application and public health. In accordance with the "near-far combination, pragmatic and comprehensive cooperation, the key breakthrough" principle, focus on the national economic and social development and medical health issues, by building is characterized by innovation and strategic cooperation in the combination of mode, to promote China's biomedical and health industry technology and the application level of ascension. In response to the COVID-19 outbreak, the university has carried out research projects combining medical and industrial sectors. Focusing on big data, artificial intelligence, robotics and other fields, the university has strengthened the sharing of advantageous resources and scientific research platforms, and explored the intersection and cooperation between medical and industrial sectors.

4.4.4. Innovation blocks

Schools to innovation as the carrier to push block double fusion area school space function, in order to "area a school" as the basic ideas, combining space remodeling and function connection, based on the experience of the MIT Kendall square, in our school as the center, in order to "innovation" block as the carrier, to create new space of campus integration, to our school at the university of science and technology park as the core of the carrier, multipoint distribution, combined with surrounding public land and green space, to build open regional communication space and innovation space.

Will go out and introduce to NCUT, combining innovation blocks construction and scientific and technological innovation, the combination of school gathered inside innovation resources, integration of innovative enterprises, schools, financial institutions, education agencies, entrepreneurs, consumer services, such as economic activity elements, upgrade the quality of life of blocks with mixed development mode, stimulate creative entrepreneurial activity, Realize the functional integration based on the integration of campus space, and build high-tech innovation blocks, art innovation blocks, cultural innovation blocks and other characteristic innovation blocks around the construction of applied university.

4.5. Two support

4.5.1. Innovation team building

Focusing on the eight scientific research directions, the university builds a scientific research and innovation team, integrates the scientific research strength of the university, breaks the boundaries of colleges and departments, and integrates multiple disciplines, complementing each other's advantages, and making joint efforts to tackle key problems. The school actively with the key university, scientific research institutes, large enterprises and other units of teachers, researchers, cooperation, across units, cross-regional, cross-border joint research, even can combine the research topic, also can undertake large they are responsible for the applied research of corpus, use external cooperation, achieve a higher level of scientific research, at the same time to improve the social status and social influence of the school.

4.5.2. Research platform construction

The operation and governance of the capital mega-city is a systematic project, which needs not only the "system, mechanism, system and standard innovation" of the new liberal arts, but also the high-tech new engineering technology to ensure the safe and optimized operation, and the intersection and integration of the new engineering and the new liberal arts.

Schools of grammar, operation management, college of information, such as college, Beijing urban governance research direction, concise school promote think-tank capacity building and government decision-making participation, promote the school think tank with the central and state organs, the depth of the local party and government organs and private cooperation, improve the pertinence, timeliness and influence of research results. The University will exert its functions as a think tank to promote urban management towards urban governance and promote efficient and orderly urban operation from the perspectives of fine governance, joint governance, rule of law and institutional innovation. At the same time, the university brings together colleges of electronic control, information, civil engineering and mechanical materials to serve the safe operation of Beijing megacity, as well as the smart, intelligent and safe operation of the capital's energy and environmental protection, transportation, electric power, public safety and emergency response.

5. Conclusion

In the future, NCUT will revolve around Beijing urban construction, operation, management and service, key construction disciplines as the core, tightly around the "smart" and "city", building intelligent information technology and intelligent control, intelligent manufacturing and intelligent building, city of risk prevention and control and comprehensive control of interdisciplinary integration, To build a new generation of information technology and urban systems engineering, besides from "theory to explore-innovation-system development-social service" by different levels and aspects to carry out in-depth systematic study, to intelligent infrastructure, efficient technical services, urban governance system as the main content, constructed from application base to complete scientific research innovation achievements landing platform. We will actively explore a scientific research organization model featuring "centralized direction, prominent advantages, and collective strength", establish a system for cultivating scientific and technological achievements with the goal of producing high-quality scientific and technological achievements, especially with the focus on state Science and Technology Awards, and vigorously improve our capacity for scientific and technological innovation.

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