

Research on Strategies for Deepening the Deep Integration of Industry, University and Research in Suzhou from the Perspective of Innovation Clusters

Mingyu Zhang, Qianqian Ding

Suzhou Vocational Institute of Industrial Technology, Suzhou 215104, China.

Abstract

The deep integration of industry, academia, and research is an indispensable way to achieve innovation driven development. It can make reasonable use of the education and scientific research resources of universities and the productivity transformation advantages of enterprises, coordinate key links in the innovation chain, promote the deep integration of core, basic, and common technologies with the industrial chain, transform the advanced technology accumulation of universities into the innovation needs of enterprises, and solve key technical problems in industrial development, It is a key move to drive the transformation of enterprise research and development production, and is of great significance for optimizing the scientific and technological innovation system and accelerating the shaping of new driving forces and advantages for development. This article first analyzes and summarizes the current situation of the integration of industry, academia, and research between Suzhou enterprises and universities from the perspective of innovation clusters, and conducts research and analysis on typical cases. At present, the Suzhou region is led by leading enterprises, with deep participation and accelerated promotion from small and medium-sized enterprises, universities, and research institutes, forming an innovation consortium with deep integration of industry, academia, and research, and full of innovation and entrepreneurship vitality. This is a new form of innovation cluster. Then, based on the current situation of the development of Suzhou innovation clusters, the problems of deep integration of industry, academia, and research from the perspective of innovation clusters are pointed out. Analyze the integration model of industry, academia, and research to address existing issues, and propose solutions to address these issues.

Keywords

Integration of industry, Perspective of innovation clusters, Innovation cluster.

1. Introduction

Research institutes and universities, as one party of industry, academia, and research, and enterprises as the other party, often conduct their own research as a whole. Due to the fact that the research and production of both parties belong to different departments and units, the goals of research and development are not the same. Universities focus on the internal principles of research, while enterprises also pay attention to the practical application of research. This leads to universities having strong research and development capabilities that are disconnected from production, enterprises focusing too much on actual production and unable to conduct in-depth research, and the segmented practical operations of both sides are not conducive to the implementation of innovation driven development strategies. The innovation of science and technology brews the innovation of industries, and without the formation of innovative products from the results of scientific and technological innovation, it is impossible to achieve the development of industrial innovation and economic growth. Therefore, the deep integration

of industry, academia, and research is the key to the development of industrial innovation, which requires the establishment of long-term and stable cooperative relationships among all parties of the innovation body, including enterprises, research institutes, universities, and supporting institutions. This article analyzes the current situation of deep integration of industry, academia, and research in Suzhou from the perspective of innovation clusters, summarizes the development of innovation clusters, identifies existing problems, and proposes effective ways to achieve deep integration of industry, academia, and research in universities and research institutes led by Suzhou's leading enterprises; And improve the cooperation mechanism for the deep integration of industry, academia, and research[1-10].

The Fifth Plenary Session of the 19th Central Committee of the Communist Party of China pointed out the need to build an efficient scientific and technological research and development system that is interdisciplinary, cross disciplinary, and collaborative with industry, academia, research, and application. It is necessary to establish a technology innovation system with enterprises as the main body, market orientation, and deep integration of industry, academia, and research. The deep integration of industry, academia, and research is a joint cooperation formed by various enterprises representing the industry, universities, research institutes, and other different social entities that collaborate and leverage their respective strengths to achieve common goals, gain common interests, and maximize their comprehensive advantages in the process. Innovation cluster is a form of industrial organization formed by the aggregation of innovative enterprises, first-class universities, knowledge centers, and affiliated institutions, with the emergence of new products, technologies, processes, and knowledge as the essential meaning of innovative organizations. It is concentrated in a certain area or clustered in the economic field, and can form effective interaction with the outside world. Industrial clusters refer to a large number of enterprises in a specific geographical area that seek to connect with each other economically, forming regional industrial clusters that are very similar to biological organic systems. An innovative industrial cluster is a cluster of innovative enterprises and high-end talents that deepen the deep integration of industry, academia, and research. They are concentrated in specific regions according to certain economic connections, with breakthrough new knowledge, new technologies, new processes, new knowledge, and brand products as the main content, relying on innovative organizational mechanisms and business models, and with institutional and cultural backgrounds that are conducive to innovation. The innovative industrial cluster with the goal of "forming innovation clusters, deepening the integration of industry, academia, and research, gathering industry innovation resources, and jointly overcoming technological challenges in industrial development" has a huge driving effect on regional economic development. Its latest development form is the innovation consortium. Innovation consortium is an industry university research organization formed by integrating other innovative enterprises and units in the upstream and downstream of the industry chain, as well as deeply integrating universities and research institutes, with leading or leading enterprises in the industry as the leading units, encouraged by the government. It closely cooperates with relevant enterprises, universities and research institutes in key technology research, innovation carrier platform construction, and high-level talent gathering, A consortium that jointly solves the innovation needs of industrial development[11-13].

2. Problems in Deepening the Integration of Industry, University and Research from the Perspective of Innovation Clusters

The cooperation mechanism still needs to be improved. The mechanism for the deep integration of industry, academia, and research under the innovation cluster still needs to be improved. During the period of school enterprise cooperation, universities usually focus on innovative educational methods and breakthroughs in theoretical science, while enterprises

focus more on the economic benefits brought by innovation. Enterprises focus on the collaborative ability of internal departments and do not attach importance to the connection with cooperating universities. The unclear division of labor and lack of interaction during the cooperation period have posed significant obstacles to the deep integration of industry university research cooperation. Due to the different roles and orientations of each subject in industry university research cooperation, there are differences in goals and interest demands, and this inherent difference in essential attributes leads to a lack of coordination and consistency in cooperation. Some organizations that plan to apply for innovation consortia lack purposefulness and are only formed to comply with relevant government policies. The specific division of labor between school and enterprise cooperation parties is not clear enough, and there is a lack of effective cooperation mechanisms. When applying for the project, both parties were proactive, but during the research and development, implementation, industrialization, and promotion stages of the project, each party worked independently and lacked mutual cooperation, resulting in a lack of mature cooperation systems and models. In terms of profit distribution, the industry and research institutions have not clearly defined the proportion of profit distribution in cooperation, leading to conflicts of interest in the ownership of new intellectual property, the economic value of scientific research achievements, and profit distribution.

The cooperation process is not smooth. Due to the fact that enterprises and universities belong to different departments in administrative management and are also under the jurisdiction of local governments at different levels. The differences in social responsibilities, value goals, and behaviors between both parties can lead to difficulties in the cooperation process. Therefore, promoting industry university research cooperation requires real-time adjustment to meet the requirements of different management parties. Universities are organizations whose primary goal is not profitability, but to meet and promote social development through education and scientific research. Their main responsibility is to cultivate innovative talents and popularize professional knowledge; Enterprises are organizations with profit as their primary goal, mainly meeting market demand through the production of products and technical services. The two are not the same in terms of goals and behaviors, and there is still conflict and opposition to a certain extent. Therefore, it is necessary to guide the various entities of industry, academia, and research to form the maximum collection, and find the maximum intersection point of the various entities of industry, academia, and research in the distribution of benefits.

In addition, under the guidance of technology policies and achievements, enterprises actively participate in industry university research cooperation and form technology alliances with universities. However, this approach is not entirely based on market demand or technological needs, but rather on considerations of government policies and interests. Due to the lack of effective communication and exchange among the parties involved in industry university research cooperation, this has laid hidden dangers for potential conflicts between the two sides in the future. The leadership structure responsible for promoting the development of linked innovation zones has not been fully established within the innovation cluster, resulting in poor coordination and coordination between functional departments of various sectors and industry university research cooperation. There is a lack of communication and cooperation between various linked innovation zones, especially for industry university research cooperation projects that mainly rely on government cross regional cooperation, and enterprises lack effective ways to participate in institutional construction.

The cooperation effect is not ideal. The survey results show that over 80% of industry university research cooperation projects have not achieved satisfactory results for both parties involved. From the perspective of universities, due to their relative weakness in the economic and social system, their autonomy in industry university research cooperation is limited. Moreover, when the development direction of innovative technology changes, if their follow-

up ability is limited, they will have to be forced to withdraw. From the perspective of enterprises, most enterprises tend to focus on short-term benefits in industry university research cooperation. Enterprises need to bear a large amount of costs in industry university research cooperation, such as venue, funds, instruments and equipment, and practical technical guidance, which leads to enterprises thinking that they have invested heavily, but the benefits are not obvious. The service supply capacity of universities often cannot meet the needs of enterprises, greatly reducing the enthusiasm of enterprises for industry university research cooperation. The cooperating universities hope to combine industry, academia, and research in depth, fully utilize enterprise resources, promote talent cultivation, introduce scientific research projects, and expand employment opportunities. The different purposes of both parties have led to difficulties in achieving efficient goals in specific cooperation between industry, academia, and research entities, and further cooperation has become unrealistic. There is a clear contrast between expectations and the results of the later stage of cooperation, which has become the most prominent practical issue in industry university research cooperation.

3. Countermeasures and suggestions for deepening the deep integration of industry, academia, and research from the perspective of innovation clusters

Building a Scientific Innovation System for Deep Integration of Industry, University and Research. The deep integration of industry, academia, and research innovation system is an inevitable trend to accelerate regional economic development and promote industrial innovation clusters. On the one hand, the government can establish research topics on how to transition from simple cooperation between industry, academia, and research to deep integration, brainstorming and proposing targeted suggestions for the actual problems in the process of industry, academia, and research integration; On the other hand, a multi departmental joint research team can be formed, led by universities and research institutes, supported by the government, organized by leading and leading enterprises, with the participation of representatives from large, medium, small, and micro enterprises, to conduct systematic theoretical research on the deep integration of industry, academia, and research innovation system, promote in-depth theoretical research, and play a supporting role in subsequent industry, academia, and research cooperation.

The government needs to play an active role in promoting the deep integration of industry, academia, and research. Through various policies and documents, efforts should be made to create a continuous driving force in the cooperation between industry, academia, and scientific research, in order to promote effective innovation and talent cultivation. The core of stimulating industry university research cooperation is to enable the market and government to jointly guide and build a good ecosystem for the integrated development of industry university research. Deepen the integration of industry, academia, and research, and enhance the government's responsibilities as participants and service providers, promoting the construction of a policy system for collaborative research and efficient achievement transformation. The government also needs to strengthen public relations efforts, raise awareness among small and medium-sized enterprises, familiarize themselves with Suzhou's policies on deep integration of industry, academia, and research, and clearly recognize that carrying out innovative industrial clusters for deep integration of industry, academia, and research is an effective way to promote enterprise development.

Ensure a common value orientation within the deep integration and innovation system of industry, academia, and research. Within the innovation system of deep integration of industry, academia, and research, all parties pursue interests in different fields such as economy, culture,

and education. However, the ultimate goal is to achieve deep integration of industry, academia, and research, find a balance of interests, and form a value orientation of mutual benefit and development. The government can promote the deep integration of industry, academia, and research in the context of different needs of both schools and enterprises. In terms of universities, it should promote the establishment of a diversified teaching practice system as soon as possible, introduce schools into factories to create off campus training bases, fully integrate theory and practice, and accelerate the construction of a community of deep integration of industry, academia, and research in education; In terms of enterprises, we encourage them to provide effective support for teaching and research in universities, introduce factories into schools, create productive training centers, and deeply integrate them with the construction of characteristic majors and talent cultivation in universities, promoting the integration of corporate culture and university education. The deep integration innovation system of industry, academia, and research provides sustainable driving force for local innovation at the macro level, and can accelerate the development of both industry, academia, and research at the micro level through deep integration innovation cooperation. The government needs to strengthen supervision to improve specialized regulations on industry university research cooperation. In terms of operation mechanism, the leading enterprise should play a leading role and actively cooperate with various innovative elements such as universities, research institutions, and industrial innovation funds to gather innovation. Encourage leading enterprises to integrate industry, academia, and research cooperation institutions to establish industrial research institutes and innovation technology centers, cultivate and gather upstream, midstream, and downstream enterprises in the industrial chain, jointly promote the close and efficient linkage of "effective markets" and "promising governments", and form a strong collaborative force to jointly promote innovation clusters.

Implement a deep integration innovation system of industry, academia, and research for sharing and co creation. In the process of industry university research cooperation, sharing and co creation are the most fundamental principles that run through and remain unchanged. The deep integration of industry, academia, and research in the innovation system has led to consensus among all parties based on the principles of sharing and co creation, and the pursuit of development. The government needs to actively participate in the construction and development of the industry university research deep integration innovation system, and timely adjust policies to ensure that the industry university research deep integration innovation system truly integrates into the local innovation development community. On the premise of jointly solving problems, sharing risks, and sharing results, we will build an innovation ecosystem that integrates the development of talent chains, innovation chains, and industrial chains.

The government can encourage universities to establish specialized research projects on the deep integration of industry, academia, and research innovation system, and provide certain research funding. The government can continuously adjust policy guidance based on the development process of the deep integration of industry, academia, and research into the innovation system, ensuring the guarantee of rules and regulations and the implementation of supervisory functions, in order to truly integrate into the local innovation and development community. The government should formulate specific incentive measures in terms of policies that can integrate industry, academia, and research innovation with industrial structure to promote industrial development and technological innovation. The government can also establish a financial fund tracking system to supervise the reasonable use of funds, and actively guide the participation of social funds while increasing investment in achievement transformation and strengthening base construction.

4. Conclusion

Suzhou, which has a profound cultural heritage and abundant resources, has reached a high level of development in local innovation clusters. With the efforts of enterprises, research institutions, and the government, the deep integration of industry, academia, and research has also achieved initial results, and a "win-win" situation is also being formed among schools, enterprises, and the government. Therefore, it is very practical and necessary for Suzhou to choose one or several suitable industries to carry out innovative industrial clusters and promote the deep integration of industry, academia, and research based on the actual situation. Cooperating enterprises should strengthen the horizontal connection of the deep integration innovation system of industry, academia, and research, strengthen technological breakthroughs, form regional brands with innovative capabilities and core technological support, and enhance the core competitiveness of Suzhou's industrial cluster. Cooperating universities and research institutes should enhance their understanding and boldly practice, actively explore new paths for the joint development of industry university research deep integration innovation system under new historical conditions, and strive to make greater contributions to the economic construction of Suzhou.

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