

**PROCEEDINGS ARTICLE**

# Research on the Modes and Countermeasures of the Industry-University-Institute Cooperation in Fujian Applied Universities

Xinbing Sun<sup>1</sup>, Zhongjian Yang<sup>1,\*</sup>

<sup>1</sup> *Minjiang University, Fuzhou, China*

**ABSTRACT**

This article first studies the five modes of industry-university-institute cooperation in colleges and universities in Fujian Province, such as cooperative development and jointly constructing entity. It points out the existing problems in the mechanism, supervision and regulations of industry-university-institute cooperation in colleges and universities of Fujian Province, and puts forward countermeasures from the aspects of system construction, incentive policy, evaluation system, etc.

**ARTICLE DATA**

**Article History**

Received 4 October 2022  
 Revised 10 October 2022  
 Accepted 27 January 2023

**Keywords**

Colleges and universities  
 Industry-university-institute  
 cooperation  
 Mode

## 1. INTRODUCTION

In October 2015, the Ministry of Education, the National Development and Reform Commission and the Ministry of Finance jointly released the "Guiding Opinions on Guiding Some Local Ordinary Undergraduate Colleges to Transform into Application-oriented Colleges and Universities". The "Opinion" points out that at present, China has built the largest higher education system in the world, making great contributions to the modernization drive. However, as the economic development has entered the new normal, the relationship between talent supply and demand has undergone profound changes. Facing the profound adjustment of the economic structure, the accelerated pace of industrial upgrading, and the continuous promotion of social and cultural construction, especially the implementation of the innovation driven development strategy, the structural contradiction of higher education has become more prominent, with a serious tendency to homogenize, which still does not meet the requirements of economic structure adjustment and

industrial upgrading. To actively promote transformation and development, there is a must to take strong measures to solve the outstanding problems in transformation and development reform, such as insufficient top-level design, insufficient reform motivation, and too many institutional constraints [1]. To solve the transformation of local colleges and universities into application-oriented ones, it is necessary to focus on innovation driven development, identify the focus and breakthrough of transformation and development, and truly enhance the ability of local colleges and universities to serve regional economic and social development and technological progress of industry enterprises. As the top priority of serving the local economy and society, industry-university-institute cooperation of colleges and universities has become a breakthrough for the transformation and development of local universities. In recent years, all countries in the world are actively exploring the best mode and path to promote the industrialization of scientific research achievements in universities through industry-university-institute cooperation, to promote the cultivation of talents in

\*Corresponding author. Email: [yangzhj@mju.edu.cn](mailto:yangzhj@mju.edu.cn)

© 2023 The Authors. Published by Athena International Publishing B.V.

This is an open access article distributed under the CC BY-NC 4.0 license (<https://creativecommons.org/licenses/by-nc/4.0/>).

universities through industry research assistance, and to enhance the independent innovation ability of enterprises and regions [2].

## **2. MODE OF INDUSTRY-UNIVERSITY-INSTITUTE COOPERATION IN APPLIED COLLEGES AND UNIVERSITIES IN FUJIAN PROVINCE**

There are various modes of industry-university-institute cooperation among colleges and universities in Fujian Province, including five main modes: cooperative development mode, jointly constructing entity mode, science and technology park area creation mode, patent and technology transfer mode, and government enterprise multiple docking mode.

### **2.1. Cooperative Development Mode**

Companies and universities can not only improve research efficiency and quality through contracts and joint R&D projects, but also improve research efficiency through interaction and cooperation with mutual funds, research teams and partners. Development and R&D personnel can also improve the R&D capabilities of the alliance and the business and innovation capabilities of researchers [3]. The distribution of benefits among project parties depends on the amount of resources invested.

### **2.2. Jointly Constructing Entity Mode**

Companies, higher education institutions and scientific research institutions focus on common goals, and focus part of their human, material and financial resources on the comprehensive planning, management, use and distribution of wealth created. Creating scientific and economic entities through action is the narrowest, most effective and mature form of cooperation in research and development.

### **2.3. Mode of Constructing Science and Technology Park Areas**

The university science park is carrier of innovation activities. It is used as a channel to directly create a knowledge economy. It is the carrier of research universities to transform scientific and technological achievements. It is also the incubator of high-tech enterprises and the cradle of cultivating innovative talents. It is a further derivative of the social function of higher education and an important bridge linking higher education, economy, society and market.

### **2.4. Patent and Technology Transfer Mode**

The technology transfer mode refers to that colleges and universities sell their own patents or technologies to enterprises, which is a direct way to transform scientific and technological achievements. Enterprises apply them to actual production according to their own conditions.

### **2.5. Government-Enterprise Multiple Docking Mode**

The government, enterprises, production education and research cooperate comprehensively. The local government combines the local industrial structure and innovation demands to create an information platform for cooperation between the public sector and the university sector, to collect the technical needs of all companies (mainly small and medium-sized enterprises). The government, as an intermediary for industry-university-institute cooperation, helps enterprises and schools find suitable partners. It greatly reduces the collection cost of supply and demand information of both sides of the industry-university-institute cooperation, and provides a good foundation for the development of industry-university-institute cooperation.

## **3. PROBLEMS IN THE INDUSTRY-UNIVERSITY-INSTITUTE COOPERATION IN FUJIAN'S APPLICATION-ORIENTED COLLEGES AND UNIVERSITIES**

### **3.1. Benefit Distribution Mechanism of All Parties Is Not Perfect**

One of the goals of industry-university-institute cooperation is to meet and expand the interests of participants and stakeholders in industry-university-institute cooperation. The subjects of industry-university-institute cooperation have different goals and interests. At present, there are still many problems to solve the interest distribution between the two sides. Although R&D cooperation highlights the cooperation principle of "joint investment, interest distribution and risk distribution", it is difficult to reconcile the contradiction between universities and enterprises to obtain greater benefits.

### **3.2. Imperfect Interest Protection and Incentive Policies**

According to the survey, Fujian universities generally face the problem of shortage of funds in productive

R&D cooperation, especially 70.29% of universities and colleges think that R&D cooperation is insufficient. Due to the lack of special R&D cooperation funds, the enterprises cannot determine the internship expenses, and the joint training of personnel is a cost. Due to the limited funds of the university and the development needs of the university itself, it is unrealistic or inconvenient to allocate too many funds from the limited funds of the university to cooperation [4]. The enterprises do not have enough funds to support the universities.

### **3.3. Regulations Need to Be Improved**

It is obvious that the regulatory environment of industry-university-institute cooperation in colleges and universities in Fujian Province is not as perfect as that of developed regions in China and abroad. First, although laws and regulations regulating R&D cooperation have preferential policies and measures in terms of productive research and development, most of the practical work to promote scientific cooperation in productive research and development is still empirical. Due to the limitations of information access channels and relevant policies and laws, the research on scientific research cooperation is not deep enough and is still in the initial stage. Therefore, the research scope is relatively narrow and the application scope is not large [5]. Qualitative and quantitative research are inadequate and there are no scientific provisions. Secondly, research and development cooperation intermediaries do not have enough expertise or supervision to provide effective cooperation information and suggestions for universities and enterprises.

### **3.4. Lack of Cooperation Effect Evaluation System**

Industry-university-institute cooperation is a systematic task, involving colleges and universities and enterprises, the public sector and the whole society. Therefore, the effect of industry-university-institute cooperation is not limited to the talent training of colleges and universities or the production and development of enterprises. All parties involved in industry-university-institute cooperation have their own criteria and considerations for the effect of cooperation. At present, there is no effective comprehensive evaluation system for industry-university-institute cooperation in China. Although some experts have established a school-enterprise cooperation evaluation system, most of them are based on the case study of cooperative education talent training.

## **4. COUNTERMEASURES FOR THE INDUSTRY-UNIVERSITY-INSTITUTE COOPERATION IN APPLIED COLLEGES AND UNIVERSITIES IN FUJIAN PROVINCE**

### **4.1. Setting Up the Correct Goal of Industry-University-Institute Cooperation**

Deviation of the concept of colleges and universities may affect smooth progress of industry-university-institute cooperation. In the process of industry-university-institute cooperation, it should be clear whether Fujian colleges and universities should focus on talent training or economic development. If people unilaterally focus on economic functions of colleges and universities and neglect their social responsibility for talent training, it will lead to deviation of the orientation of colleges and universities, thus violating the original intention of running them. It also affects quality of talent supply of colleges and universities to society, which will directly affect the macroeconomic environment of Fujian Province. Therefore, colleges and universities in Fujian Province should make it clear that in the process of industry-university-institute cooperation, economic efficiency is only one of the goals of industry-university cooperation, and improving the quality of talent training is the ultimate goal. The purpose of industry-university-institute cooperation in colleges and universities is to break the traditional university model, but some universities still have outdated ideas. They focus on developing key disciplines and improving the number of master's and doctoral degrees. Their purpose of scientific research is only to evaluate professional titles, without looking at the market and lacking insight into social and market needs.

### **4.2. Improving the Legal and Regulatory Guarantee System for Industry-University-Institute Cooperation**

At present, the legal and regulatory system and risk prevention measures of Fujian Province's industry university research cooperation are not perfect, and legal aid and legal resources are relatively few. It is necessary to accelerate the establishment of a sound legal guarantee mechanism based on the current problems of Fujian Province's industry-university-institute cooperation, and make great efforts to promote and implement it. Local governments should formulate and improve relevant expenditure policies, including personnel training, technological innovation plans, and transformation and industrialization.

### 4.3. Establishing Encouraging Policies and Actively Guiding Cooperation

China's industry-university-institute cooperation started late, and the enthusiasm of enterprises to participate in industry-university-institute cooperation is generally insufficient. Therefore, colleges and universities in Fujian Province should take the initiative to actively guide enterprises to carry out industry-university-institute cooperation projects, guide production practice with advanced theories, and encourage enterprises to participate in scientific and technological projects and transform scientific and technological achievements, in order to transform basic theories into applied technologies.

It can be carried out from the following aspects. First, the colleges and universities can set up professional groups to have an organized, high-level and proactive contact with enterprises to win their trust and cooperation motivation [6]. Second, before the transformation of scientific and technological achievements, teachers should be actively encouraged to submit patent applications in a timely manner, in order to effectively protect the intellectual property rights of university teachers and lay a solid foundation for successful cooperation. Third, it is necessary to formulate corresponding management measures for the transformation of scientific and technological achievements, and encourage R&D workers to participate in industry-university-institute cooperation, to promote the organic integration of market demand, academic talents, scientific research technology, capital and other elements.

### 4.4. Reforming the Evaluation Criteria for the Effectiveness of Industry-University-Institute Cooperation

There is a must to evaluate the effect of participation in industry-university-institute cooperation projects in colleges and universities, and release secret evaluation in the teacher title evaluation system. It is also necessary to thoroughly reform the traditional teacher evaluation profession and degree promotion system, focusing on scientific research projects and academic documents. More importantly, it will be a necessity to evaluate the design of engineering projects, industry-university-institute cooperation and technical services, give priority to professors with rich company experience, and establish a team of teachers who can improve the quality of talent training [7].

## 5. CONCLUSION

The industry-university-institute cooperation in colleges and universities in Fujian Province is a long journey. Universities, enterprises, scientific research institutions and the government all need to seek the way out. All parties involved in the industry-university-institute cooperation should be duty bound, always cultivate high-quality innovative talents, and actively participate in the social relations of industry-university-institute cooperation. Based on the needs of Fujian Province to cultivate innovative talents, promote the industrialization of scientific research achievements, and promote the transformation of local industrial structure and economic development, this article comprehensively applies management, economics and other relevant theories, and summarizes and puts forward the countermeasures for the industry-university-institute cooperation of Fujian universities by analyzing the problems existing in the industry-university-institute cooperation of Fujian universities.

## ACKNOWLEDGMENTS

Fund projects: Fujian Young and Middle-Aged Teacher Education Science Research Project (JAS21278) and Education Management Research Special Project of Minjiang University (MJUF2021A01).

## REFERENCES

- [1] Development Research Center of the China Association for Science and Technology. National Innovation Capacity Evaluation Report [R]. Beijing: Science Press, 2009. (in Chinese)
- [2] Li Lianshui. On the Benefit Distribution Mechanism of Industry University Research Cooperation Innovation [J]. *Soft Science*, 2007(2): 59-61. (in Chinese)
- [3] Zhang Tong, Li Lianshui. The Benefit Mechanism of the Cooperation Between Industry and Academia [J]. *Journal of Harbin Institute of Electrical Engineering*, 2016(9): 416-422. (in Chinese)
- [4] Dong Lijie. Financial Support to Innovation of Inner Mongolia Science and Technology [D]. Inner Mongolia University, 2013. (in Chinese)

- [5] Dong Meiling. Research on the Pattern of the Cooperation and Synergy Development Between Stanford University and Silicon Valley Enterprises [J]. Science and Technology Management Research, 2011(18): 64–68. (in Chinese)
- [6] Gao Feng. Analysis and Exploration of Innovation Modes for Industry-University-Institute Cooperation [D]. Shanghai Jiaotong University, 2014. (in Chinese)
- [7] Yang Tongling. Study on the Countermeasures of Sustainable Development of Industry University Research Cooperation in Shandong Universities [D]. Shandong Normal University, 2018. (in Chinese)