

# Research on Synergistic Relationship Between Local University Discipline and Regional Industries

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## ABSTRACT

Starting from the key elements of the diamond model, we construct a "double diamond model" for the mutual development of industry local universities and regional industries, which takes "two-way demand" as the link, and takes a local university in South China as an example, research shows that the university's characteristic disciplines and regional industries are converging, and they have good mutual adaptability. The promotion of "peer competitiveness" is the common goal of the development of disciplines and regional industries in local universities. In the process of discipline construction, local universities should make clear their own positioning, take the service area as the purpose of discipline construction and development, improve the mutual adaptability between themselves and regional industries, and promote the coordinated development of discipline chain and industry chain.

**Keywords:** *Discipline construction of local university; Regional industries; Diamond models; Synergistic Relationship*

## 1. INTRODUCTION

The local university originally belonged to the relevant national industry departments, after the reform of the higher education system at the end of the 20th century, it was managed by education department and local government. It has profound industry deposits and has made indelible contributions to the national economic development and social construction. The discipline construction of local universities presented an "unbalanced" characteristic state in favor of a certain industry when they were subordinate to the industry sector [1]. After entering a comprehensive university, more and more discipline settings have gradually reduced the proportion of specialty in the University, which is difficult to be further developed in the new situation. Different professionals also show the trend of "universal" in the training process, which is not suitable for the development characteristics of subdivision of labor division in today's society [2].

*The outline of the national medium - and long-term plan for educational reform and development (2010-2020)* also reflects another problem existing in the development process of the current industry-featured universities -- weak connection with the economic and social development of their regions, not obvious support, vague

and inaccurate regional service positioning. Local universities often ignore or do not know how to participate in the economic and social development of their localities, and are difficult to provide services for regional construction with their own characteristics [3].

In recent years, "Wisconsin thought" has been increasingly valued in China, which has important reference significance for the discipline construction and development of universities [4]. The studies on the discipline construction of universities and the development of regional social economy are mostly from the theoretical point of view that the current comprehensive university and the regional society are in need of each other. Universities should be suitable for regional economic transformation and development, collaborative and effective construction adjustment among disciplines [5]. Based on the above analysis, universities, especially local industry characteristics universities, should combine their own characteristics with regional social and economic development in the process of discipline construction. It is a topic worth discussing how to cooperate the discipline construction of the local university and the development of the regional industry. This study constructs a "double diamond model" of the mutual development of disciplines and Regional industries of local universities with "demand" as the link, in order to explore the mutual development of both sides.

## 2. Double Diamond Model Construction: Specialty University Discipline and Regional Advantage Industry

"Diamond model" is a theoretical model reflecting the industrial competitive advantage of a country[6] proposed by porter in 1990 after he studied the industrial development of both developed and emerging countries at that time. It expounds the application of four environmental factors including "production factors", "demand conditions", "enterprise strategy, structure and peer competition" and "related industries and supporting industries", as well as the influence of two auxiliary factors including "opportunity" and "government" [7][8].

### 2.1. The relationship between industry-featured universities and regional industries -- two-way demand

Based on the detailed analysis of the influencing factors of the diamond model, it is the common goal of the characteristic university and the regional dominant industry to enhance the competitiveness of the industry. One of the ways to improve the competitiveness of the industry is to obtain effective external resources to improve ourselves from our own needs. This kind of mutual relation makes the local university and the region advantageous industry close relation. It is possible to build a double-diamond model combining industry-featured university and regional dominant industry with "two-way demand" as the link, as shown in figure 1.

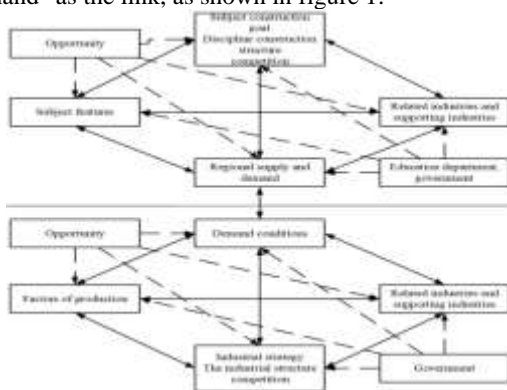


Figure 1 Double diamond model construction: specialty university discipline and regional advantage industry

### 2.2. Unilateral diamond model element dominated by the discipline development of local university

(1) Subject features: discipline characteristics have a major impact on the competition of industry-featured universities in the same industry across the country. At the same time, on the basis of the original featured disciplines, it is

necessary to make adjustments or scientific innovations to adapt to the current social situation, so as to make them achieve further development and have a competitive advantage over the original featured disciplines.

(2) Regional supply and demand: The development of regional competitive industries cannot be separated from the investment of professional talents and the support of technology. Universities can also obtain the support of the relevant conditions in the process of adjusting the characteristic disciplines or developing the emerging disciplines adapted to the regional industries.

(3) Related and supporting industries: the relationship between universities and relevant industries is often more frequent and closer than that of the regional society. For the industry-featured universities that have cooperated with them for a long time, it also has good promotion significance in talent cultivation and construction. At the same time, the long-term experience accumulated by the university and the cooperative enterprises in the industry can provide a more explicit guiding role for the development of the regional industries.

(4) Discipline strategy, discipline structure and industry competition: discipline strategy and discipline structure, to some extent, determine the allocation orientation of the school's limited resources. The development of disciplines and the establishment of new disciplines based on characteristic disciplines are the important factors that determine the competitiveness of universities.

(5) Opportunity: the state is promoting the construction of "first-class universities, first-class disciplines, first-class majors and first-class courses", and encouraging colleges and universities to "give play to their advantages and develop their own characteristics", which provides a rare strategic opportunity for the development of universities.

(6) Government: the auxiliary elements formed by the education department and the government are relatively neutral. Education departments and local governments' relevant policies and capital investment in regional industries and universities have an impact on the discipline construction of universities. University has already possessed the talent training ability and the science and technology innovation ability also has the influence on the policy adjustment and the special fund investment.

### 2.3. Unilateral diamond model element dominated by the development of regional industries

(1) Factors of production: in order to promote the steady improvement of regional economic level through the development of regional industries, a region needs to combine its own advantages, attach importance to the mechanism that can create factors of production, and develop high-level and characteristic factors of production.

(2) Demand conditions: in a certain sense, the market's demand for and industrial output has enhanced the influence of regional industries, promoted the standardized, large-scale and efficient development of

industries, and attracted high-quality talents and external capital investment. For the regional economy, the greater the influence of the demand conditions of the regional industries, the faster the regional economy will be promoted.

(3) Related industries and supporting industries: it is of great significance for the development of regional economy to take the largest enterprises as the leading ones and to promote the development and upgrading of the whole industrial cluster from top to bottom with advanced production management concepts.

(4) Industrial strategy, industrial structure and industrial competition: the development strategy and scientific and reasonable organizational structure of the industrial clusters undoubtedly play a very important role in improving the competitiveness of industrial clusters. The existence of competitors in the same industry and the progress and development of competitors promote the industry itself to continuously optimize and improve in the competition and become more competitive.

(5) Opportunity: Whether the regional dominant industry can grasp the events of these opportunities, and improve or even disintegrate and reshape its own development strategy and internal structure in the impact of the events, so as to improve its own competitiveness is very critical for industrial development.

(6) Government: on the one hand, the government's regulation policies and financial subsidies will have an impact on the production factors and demand factors of the regional competitive industries, so as to enhance the competitiveness of the industries in the market. On the other hand, when the four basic elements of the regional industries change, the relevant government policies will also be adjusted appropriately.

### **3. Empirical Analysis: A Case Study of a Local University in South China**

#### ***3.1. Analysis of the subject construction of industrial features Universities***

The university was originally under the Ministry of metallurgical industry of the people's Republic of China. After 2013, it was jointly established by the provincial people's government, the Ministry of industry and information technology and the Ministry of education. It belongs to the category of local university. The major of mining engineering and metallurgical engineering has a relatively significant industry background, and has accumulated profound school running experience. Since its establishment, it has trained and transported a large number of professional talents for related industries. However, in the fourth round of subject evaluation, only metallurgical engineering subject evaluation result is C +, mining engineering subject evaluation result is C, Marxism theory, material science and engineering and

other five subjects are all evaluated as C -, and no major enters the top 1% of ESI. This evaluation result is not optimistic for the university with industrial features, it is pressure and also contains huge development opportunities. Under the background of the national "double first-class" university construction, the local university has made corresponding optimization and adjustment to its own subject construction in the fierce competition among the same industry: first, take the traditional advantageous subjects as the guide, build the subject peak, and enhance the relevant subjects in the form of "subject group"; second, pay attention to the interdisciplinary and collaborative development of subjects, and put the basic industrial features into practice. Finally, it emphasizes the "dynamic management" of subject construction, improves the coordination mechanism of subject construction, and makes the school's resource allocation more reasonable.

#### ***3.2. Analysis on the development of regional industry***

The industrial base of the region is relatively weak. In order to create a new situation of regional revitalization and development, the region has advocated to make every effort to fight the key battle of social and economic development with "main industry" as the primary focus since 2016, and take the construction of a number of regional leading industries as the key projects of regional social economy, so as to promote the sound, healthy and stable development of regional social economy.

In the regional industrial development planning of promoting scientific and technological innovation, the development strategy of promoting industrial research and learning cooperation is emphasized, so as to achieve collaborative innovation of industry, learning, research and application. The industry and the industry characteristic universities in the region jointly set up the Regional Industry Development Research Institute. The expert professors and the industry research team of the university provide the corresponding services for the major decision-making and planning of the regional industry development. At the same time, the University also provides the support of science and technology and talents for the construction of enterprises and major projects in the region.

#### ***3.3. Analysis of the elements of the double diamond model with demand as the "bridge"***

Based on the above analysis of the development of industry characteristic universities and regional industries in the region, the four main environmental elements of diamond model of universities and industries are summarized, as shown in Table 1.

**Table 1 Key elements of "double diamond model" for the development of subjects and Regional Industries of industry characteristic Universities**

Subject of a local university in South China		Regional advantage industry	
Subject features	Mining engineering, metallurgical engineering, material science	Factor of production	Mineral resources, human resources, technical basis and historical details
Regional supply and demand	Professional talents and innovative technology	Demand conditions	Regional industrial and service production
Related industries	Advanced equipment, industrial development planning, etc	Related industries	Rare earth tungsten industry, furniture, clothing
Supporting industries	Mining, rare earth, metallurgy, chemical industry, e-commerce	Supporting industries	Intelligent equipment manufacturing, etc
Subject objectives	In the fifth round of subject evaluation, we have obtained satisfactory evaluation results	Industrial strategy	"Focus on industry, double in three years", "supplement chain, increase chain.
Subject structure	With the traditional dominant subjects as the guide and the current national social	Subject structure	Take "two cities, two valleys and two belts" as the development leader to promote
Horizontal competition	The subject ranking, ESI ranking and university comprehensive	Horizontal competition	The popularity and influence of Regional Advantageous I

Due to the natural resource advantages of the region itself, the subject construction and the regional industries of the university show a trend of convergence. The characteristic subjects of the university are the same as the industries of the regional industries, which belong to the category of mining, rare earth and materials. At the same time, the acquisition of their own needs makes the subjects of industry-specific universities and regional industries closely linked and coordinated, and the promotion of peer competitiveness is the common development goal of both sides. This shows that the subject construction of the local university and the regional advantage industry have quite obvious mutual adaptability.

**4. Strategies for the Mutual Development of Subjects and Regional Industries in Universities with Industrial Features**

Based on the analysis of the mutual adaptability between the subject construction of a local university in south China and the development of regional, the subject construction aiming at serving the regional development makes the university and the regional industry have strong mutual adaptability, which makes the two sides have a better development trend in the industry competition. According to the analysis of this paper, in order to better promote the mutual development of subjects and regional industries of local industry characteristic universities, the following strategies are proposed for reference:

First of all, according to the traditional subject teaching details, combined with the development background of subject construction and economic development trend, timely adjust and suspend the unsuitable subjects that lack characteristics and lag behind in development, and create new subjects that keep up with the pace of the times and face the future.

Secondly, in the construction of subjects, industry-featured universities can adopt the form of "peak" of subjects, take a number of subjects as the basis for the development of subjects, take traditional dominant subjects as the leader, promote the overall improvement of other subjects in the subjects, and cultivate the ability of cross-collaboration and cooperative innovation among subjects.

Finally, the subject construction of industry-featured universities should be based on the development of regional industries, take serving regional social and economic development as the goal of subject construction of industry-specific universities, grasp the scientific research and talent demand of regional economic construction, maintain good interaction between supply and demand with the region, and pursue win-win cooperation between industry, university and research in the way of "linkage".

**5. Conclusion**

The research results show that the characteristic universities and the dominant industries are the typical "double diamond model". The case study shows that there is obvious synergistic relationship between the discipline

construction of a local industry-featured university and the regional dominant industry, and it is suggested to further excavate their respective core elements and infiltrate their advantages into each other, promote each other and develop together.

## **ACKNOWLEDGMENT**

This work was supported by social science research "12th five-year plan" project of Jiangxi province (15JY21)

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