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Research on the Mechanism of Coordinated Development of Higher Education in Chengdu-Chongqing Economic Circle

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Abstract: As a national strategy, the coordinated development of higher education in Chengdu-Chongqing economic circle is not only the core link in the construction of regional innovation system, but also the key path to solve the imbalance of educational resources allocation in the east and west. In 2024, the GDP of the Chengdu-Chongqing economic circle reached 8.7 trillion yuan, and the collaborative innovation index increased by 73.47% compared with 2020. However, the cooperation of higher education still faces the practical problems of institutional barriers, lagging discipline layout, and insufficient internationalization level. This paper discusses the optimization path of the coordinated development of Chengdu-Chongqing higher education based on the education coordination goal of the Planning Outline of the Construction of Chengdu-Chongqing Economic Circle and the regional governance experience at home and abroad.

Keywords: Chengdu-Chongqing economic circle; higher education; coordinated development

1. Introduction

In January 2020, China made a decision to promote the construction of the twin city economic circle in the Chengdu-Chongqing region, aiming to form an important growth pole for high-quality development in the west. As the core carrier of science and technology and talent supply, higher education needs to solve the problems of resource dispersion and homogeneous competition through regional coordination mechanism. Since 2020, driven by the policies of the state, Sichuan Province and Chongqing Municipality, the Chengdu-Chongqing region has initially developed an integrated ecosystem of education and industry through multi-level policy coordination, university alliances, and dynamic adjustments of disciplines. However, it still needs to break through administrative barriers and strengthen institutional innovation to unlock endogenous momentum.

The coordinated development of higher education in Chengdu-Chongqing economic circle is not only conducive to improving the quality and level of regional higher education, enhancing its ability to serve the regional economic development, but more importantly, it can promote educational equity in the Chengdu-Chongqing economic circle, improve the overall regional education level, and foster social development. This is not only the important content and internal demand of the construction of Chengdu-Chongqing economic circle, but also the catalyst to accelerate the construction of Chengdu-Chongqing economic circle.

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2. The Feasibility of Chengdu-Chongqing Higher Education Coordinative Development

2.1. Theoretical Level

2.1.1. Connotation and Development of Synergetics Theory

As an important branch of systems science, Synergetics Theory was formally established by the German physicist Hermann Haken in 1971. The theory focuses on the self-organization evolution of open systems, revealing the dynamic mechanism of the ordered structure formed by the nonlinear interaction of internal subsystems. The core proposition of Synergetics Theory is to explain the critical conditions of the transformation from "Disorder" to "Order" and emphasize the dominant role of the order parameter in the evolution of the system. When the system approaches the critical point, the cooperative movement between subsystems will surpass fluctuations, achieving the domination of slow variables over fast variables through the Slaving Principle, and eventually forming a new steady-state structure [1].

In the field of education, the application of Synergetics Theory breaks through the traditional linear thinking and provides a new paradigm for explaining the complexity of education system. The methodological enlightenment of Synergetics Theory is that it emphasizes the dynamic nature of system evolution, the nonlinearity of element correlation and the testability of cooperation degree. Its academic value lies in breaking through the limitations of mechanical reductionism and providing interdisciplinary analysis tools for the optimization of education system, especially in explaining the phenomenon of regional higher education resource sharing and interdisciplinary integration.

2.1.2. The Construction and Evolution of Regional Educational Synergetic Development Theory

Regional Educational Synergetic Development Theory is an application-oriented theoretical framework formed on the basis of Synergetics Theory, integrating regional economics and innovation system theory. Its core meaning is that multiple educational subjects in a specific geographical space, realize the optimal allocation of resources and functional complementarity through the institutionalized cooperative mechanism, and ultimately achieve the overall benefit maximization. The theoretical construction follows the evolutionary path of "concept transplantation-paradigm innovation-practice verification" and goes through three stages of development:

1) Embryonic period (in 1980s)

Inspired by Christopher Freeman's theory of National Innovation System, scholars began to pay attention to the spatial agglomeration effect of the education system and proposed the concept of "educational collaboration area", but a systematic theoretical framework has not yet been formed.

2) Molding period (in early 21st century)

Along with the practical explorations of the European Union Bologna Process, the American Ivy League, and others, the theoretical framework has gradually been improved. Scholar Burton Clark proposed the "triangular coordination model" of higher education, emphasizing the synergistic game of government, market and academic forces. Chinese scholar Pan Maoyuan constructs the regionalization theory of higher education to reveal the tension between administrative division and educational resource allocation.

3) Deepening period (from 2015 to present)

Digital transformation has promoted theoretical innovation and emphasizes the construction of "physical-virtual" dual-space collaborative environments. "Chinese Education Modernization 2035" puts forward the strategy of "regional higher education Community", which promotes the theoretical research to institutional innovation and effectiveness evaluation.

The deep coupling of the two theories constitutes the general theoretical framework of regional higher education research. The Synergetics Theory provides the methodological basis, and the Regional Educational Synergetic Development Theory completes the application transformation, which forms a "general-special" logic closed loop.

Under the background of the unbalanced superposition of higher education popularization and regional development, the two theories have special practical significance:

- 1) Promoting equity in education: We will ease the contradiction between the "center and periphery" structure through cross-regional teacher sharing and curriculum selection mechanisms.
- 2) Driving innovation and transformation: They mean to building a "discipline-industry-city" innovation triangle to support the energy level transition of regional economies (such as the construction of the Greater Bay Area International Education Demonstration Zone).
- 3) Addressing global challenges: They are strengthening the capacity reserve for building a community with a shared future for mankind through transnational educational collaboration networks.

2.2. The Relationship between Regional Economic Development and the Coordinated Development of Higher Vocational Education

2.2.1. The Promoting Role of Higher Education on Regional Economy

Personnel training and supply. Higher education provides a large number of professional and technical talents and highly skilled workers for the regional economy, specifically meeting the needs of specialized talents for sectors such as technology-intensive and service-oriented industries. The supply of these talents has directly contributed to the upgrading of regional industries and economic growth.

The upgrading of technical skills. Through practical teaching and skill training, higher education improves students' practical skills and technical proficiency, enabling them to quickly adapt to jobs and enhance overall labor productivity.

The integration and innovation of production and education. Colleges and universities usually establish close cooperative relations with enterprises, integrate production and education, and jointly engage in R&D and innovation activities. This not only promotes the docking of higher education content and industrial demand, but also provides technological innovation support for enterprises and enhances the competitiveness of enterprises.

Promoting employment and social stability. Higher education provides educational services that match market demand, which helps to improve the employment rate of graduates, reduce structural unemployment, enhance social stability, and create a favorable social environment for economic growth.

2.2.2. The Significance of the Coordinated Development of Higher Education for the Construction of Chengdu-Chongqing Economic Circle

To promote the integration of regional educational resources. Through the coordinated development of higher education, the educational resources of Chengdu-Chongqing can be integrated, the advantages can be complementary, the quality of education can be improved, and talents can be provided for the construction of the economic circle of the two cities.

To promote the integration of industry and education and cooperation between colleges, universities and enterprises. The close combination of higher education and local industries helps to form innovative industrial clusters, to promote the transformation and application of scientific and technological achievements, and thus to promote the innovative development of the economy.

To strengthen the internal driving force for regional economic development. The coordinated development of higher education can train more talents equipped with high-

quality technical who can meet the needs of regional economic and society development, and finally provide a strong human resource guarantee for the construction of Chengdu-Chongqing economic circle.

To improve regional balance in educational services. Through the establishment of coordination mechanism in the field of education, the high-quality educational resources in Chengdu-Chongqing area can be more abundant, the opportunities for people in these two regions to receive education can be increased, and education equity can be promoted.

To build an open and shared education system. Coordinated development is conducive to the formation of a complete system, complete services, diversified schools, scientific management, open and shared education system, such a system can better serve the overall situation of regional economic and social development.

To realize the simultaneous advancement of education policies and programs. Chengdu and Chongqing jointly strive to incorporate major educational policies, projects, platforms, and reforms into national planning, which will help the two places to advance simultaneously in educational development and jointly improve educational standards.

To establish a long-term educational cooperation mechanism. The framework agreement signed by Chongqing Education Commission and Sichuan Provincial Department of Education has clarified the cooperation content in many aspects such as the normal mechanism of co-building education cooperation, which is conducive to the formation of long-term stable cooperative relations between the two places in the field of education.

The coordinated development of higher education has many positive effects on the construction of Chengdu-Chongqing economic circle, which can not only improve the quality and efficiency of education, but also provide talent support and intellectual support for regional economic development, and is an important force to promote the construction of Chengdu-Chongqing economic circle [2].

3. The Current Situation and Effect of Collaborative Development of Chengdu-Chongqing Higher Education

3.1. To Improve the Working Mechanism and Seize the Development Opportunity Together

After the construction of the Twin Cities Economic Circle in Chengdu-Chongqing region became a national strategy, the two governments signed the Framework Agreement on Promoting the Coordinated Development of Education in the Twin Cities Economic Circle in Chengdu-Chongqing Region, clarifying the overall goal and division of tasks of education coordination, and incorporating higher education coordination into the core layout of high-quality regional development

The Sichuan Provincial Government and the Chongqing Municipal Government took the lead in signing the Framework Agreement on Promoting the Coordinated Development of Education in the Chengdu-Chongqing Economic Circle, establishing a joint meeting system, setting up a joint office, and setting up a special working group to explore a cross-administrative system and mechanism for the coordinated development of education. Held a joint meeting to promote the coordinated development of education in the construction of the Chengdu-Chongqing Twin City Economic Circle, formulated the action plan and key task work plan for the coordinated development of education in the Chengdu-Chongqing Twin City Economic Circle, clarified the task of joint construction, and consolidated the foundation of joint construction.

3.2. To Deepen the "Integration" Strategy and Promote Collaborative Innovation in Higher Education

The two places signed the "Memorandum of Cooperation on Jointly Implementing the Pilot Strategic Project of Comprehensive Reform of Higher Education", adopting the "university pilot + government support" model, focusing on promoting high-level universities to take the lead in the co-construction of disciplines and joint training of top-notch innovative talents. Meanwhile, they established Chengdu-Chongqing Excellent Engineer

Innovation Research Institute, relying on the "university + laboratory + enterprise" model, focusing on the advantageous industrial clusters in Sichuan and Chongqing, and creating an innovation and development platform integrating engineering and technical personnel training, scientific research, achievement transformation, innovation and entrepreneurship. The two governments also guided universities, research institutes and enterprises of the two places to establish industry-university-research consortiums to jointly carry out theoretical and technical research in key fields such as digital intelligence technology.

3.3. To Promote the Integration of "University, Government and Enterprise" and Amplify the Effectiveness of Coordinated Development of Education

Firstly, to strengthen the "wisdom" of the school. Through establishing of university alliances, they are promoting the sharing of facilities, equipment sharing, mutual employment of teachers, mutual selection of courses, mutual recognition of credits, and mutual assistance in scientific research between universities. Secondly, to strengthen the "financial innovation" of schools and enterprises. They are trying to promote the linkage between education, economy and information technology, finance, science and technology and other departments of the two places, to create a university-enterprise "double incentive" mechanism, to build provincial demonstration projects of integration of industry and education in batches, and to build provincial and municipal modern industrial colleges. Thirdly, to strengthen the "integration" of the university-government. They select some areas with a good industrial foundation and concentrated vocational education resources to carry out pilot projects for the integration of industry and education, and promote the reform practice of integrating universities and governments.

4. The Realistic Dilemma of Chengdu-Chongqing Higher Education Coordinated Development

4.1. Institutional Barriers Needing to Be Overcome

Chengdu is the main force in the construction of "Western education Province", and Chongqing should build "western education highland". From the perspective of comprehensive strength of education, the strength of higher education in Chengdu-Chongqing region is relatively close, reaching a relatively balanced state. Chengdu has a slight advantage in terms of level, while Chongqing has a slight advantage in terms of quantity [3]. There is a study showing that the dominant strategy of the educational administrative departments in Chongqing and Sichuan is providing low-intensity educational resource support. Therefore, for the education alliance established based on the Chengdu-Chongqing economic circle is trapped in the "prisoner's dilemma" [4].

4.2. Insufficient Adaptation between Disciplines and Industries

Firstly, the discipline layout lags behind industrial upgrading. Large-scale industrial clusters such as the Chengdu-Chongqing electronic information and equipment manufacturing sectors urgently require interdisciplinary talents. However, the majors in colleges and universities are still concentrated in traditional mechanical manufacturing (accounting for 45%), and the coverage rate of disciplines in frontier fields such as new energy and biomedicine is less than 60%, leading to a talent gap. Secondly, research transformation efficiency is low. Although Chengdu-Chongqing area has a certain number of scientific research institutions and colleges and universities, these institutions and colleges and universities are also continuing to carry out scientific research exploration, but many scientific research results are difficult to transform into actual productivity, mainly because of the failure to accurately connect scientific research results with market demand and the transformation mechanism of scientific research results is not smooth, so that the advantages of scientific and technological innovation can not be fully played [5].

4.3. Gap in the Level of Internationalization

Some studies found that higher education in Chengdu-Chongqing region still faces multiple challenges. The main problems are the imbalance of higher education resources distribution, the lack of advanced international strength, the lack of attraction to international talents and the small scale of Sino-foreign cooperation in running schools [6].

5. Conclusion

5.1. To Do Well in Top-Level Design and to Strengthen the System of Regional Coordination

To establish a cross-administrative coordination management body, the "Chengdu-Chongqing Committee for the Coordinated Development of Higher Education", which mainly focuses on coordinating the formulation of the medium- and long-term development plan for Chengdu-Chongqing higher education, optimizing the three-level linkage mechanism of "decision-making, coordination, and implementation", empowering grass-roots executive departments with greater autonomy, and increasing the participation of special working groups in decision-making.

5.2. To Promote Deep Coupling between Disciplines and Industries

Firstly, a dynamic discipline adjustment mechanism should be established, along with a tripartite discipline evaluation platform involving "industry, universities, and government". Secondly, they should strengthen the functions of carriers that integrate production and education, build innovation platforms integrating industry and education in integrated circuits, industrial Internet and other fields, and increase the local conversion rate of scientific research results.

5.3. To Enhance International Coordination

On the one hand, they can make innovations in joint training mechanisms for international talents. They can jointly set up the "Chengdu-Chongqing International Talent Program", so as to promote universities of the two places and QS top 100 universities to build Chinese-foreign cooperative educational institutions, implement the "double tutor + double degree" training model, and to focus on cultivating international compound talents in advanced manufacturing, artificial intelligence and other fields. On the other hand, they can strengthen their ability to collaborate on international research. Through cooperating with well-known international research institutes and other institutions in similar fields, the two regions can choose to build an international joint research center, to increase international scientific research projects, and to improve the level of technology transfer.

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