

Original Research Article

Research on the innovation of co-construction and sharing mechanism of industry-university-research resources in vocational education in the Guangdong-Hong Kong-Macao greater bay area

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Abstract: Against the GBA's high-quality development, vocational education is key to talent supply and industrial upgrading. Based on relevant theories, this study explores its industry-university-research resource co-construction and sharing dilemmas, constructs the innovative mechanisms and targeted paths, providing theoretical and practical references for vocational education-region integration and GBA vocational education high-quality development.

Keywords: Guangdong-Hong Kong-Macao greater bay area; vocational education; industry-university-research cooperation; resource co-construction and sharing; mechanism innovation; collaborative governance; digital education

1. Introduction

1.1. Research background

The Guangdong-Hong Kong-Macao Greater Bay Area demands growing high-quality technical talents for industrial upgrading. Vocational education must integrate closely with industries, and industry-university-research resource co-construction and sharing has become critical for educational efficiency. Supported by multiple national and local policies, such cooperation still faces obstacles including institutional differences, resource fragmentation, low connectivity and poor sustainability across the region, which restrict talent cultivation and industrial services. Thus, research on mechanism innovation is theoretically and practically significant.

1.2. Research significance

Theoretically, this study breaks through the limitations of traditional perspectives, systematically explores the innovative mechanism of resource co-construction and sharing against the background of regional integration, enriches the theoretical system of industry-university-research cooperation in vocational education, extends the application of collaborative governance theory in cross-regional educational resource allocation, and provides a new analytical framework for related research.

Practically, it helps break administrative and institutional barriers, promotes the free flow and efficient sharing of high-quality resources in the Greater Bay Area, improves the matching between talent supply and industrial demand, supports the construction of a world-class bay area, and provides replicable experience for vocational education reform in other regions.

1.3. Research ideas and methods

This study follows the logic: theoretical basis → status analysis → problem identification → mechanism construction → path optimization. It adopts literature review, field investigation, case study, comparative analysis and inductive analysis to clarify theories, investigate practice, summarize experience and construct mechanisms.

2. Literature review

2.1. Research on industry-university-research cooperation in vocational education

Foreign studies on vocational education industry-university-research cooperation started early, focusing on

cooperation modes, resource integration, policies and social benefits. Scholars stress that industry participation is core, resource sharing reduces costs and enhances training practicality, and multi-agent participation and market mechanisms are essential. Domestic studies mainly explore cooperation modes, problems and solutions, pointing out that imperfect institutions, inadequate interest coordination and low enterprise initiative restrict cooperation. Yet most focus on single regions or institutions, lacking systematic research from the Greater Bay Area cross-regional integration perspective.

2.2. Research on educational resource co-construction and sharing

Existing studies focus on resource allocation, platform construction, technology, benefit distribution and risk management, stressing that institutional mechanisms are critical to sustainable resource sharing. Digital technologies like big data, cloud platforms and AI are found to promote intelligent resource sharing. However, research on cross-system, cross-border industry-university-research resource co-construction and sharing for vocational education in the Greater Bay Area is still limited.

2.3. Research on vocational education development in the greater bay area

Current studies focus on talent training, curriculum reform, cross-border cooperation and teacher development. Few explore industry-university-research resource co-construction and sharing from mechanism innovation. This study fills the gap and supports high-quality development of regional vocational education.

3. Theoretical basis

3.1. Resource dependence theory

Resource dependence theory states that organizations with different resource endowments rely on each other for development. Vocational colleges need enterprises' training resources and employment channels; enterprises need skilled talents and technical support from colleges and research institutions; research institutions need application scenarios and transformation channels from industry and education. Thus, industry-university-research resource co-construction and sharing is an inevitable outcome of resource interdependence.

3.2. Collaborative governance theory

Collaborative governance theory holds that complex issues require joint participation of multiple stakeholders. Consensus and common goals can be achieved through equal consultation and cooperation. Vocational education resource sharing involves multiple parties, so a collaborative governance mechanism is needed to coordinate rights, responsibilities and interests.

4. Current situation of industry-university-research resource co-construction and sharing in GBA vocational education

4.1. Continuous improvement of policy support system

In recent years, the state and Guangdong, Hong Kong and Macao have issued multiple policies to support vocational education in the Greater Bay Area, promoting industry-education integration, school-enterprise cooperation and cross-border education cooperation. These policies provide a sound institutional environment for industry-university-research resource co-construction and sharing.

4.2. Diversified development of cooperation forms

A large number of vocational colleges in the Greater Bay Area have carried out various forms of industry-university-research cooperation with enterprises and research institutions, including co-construction of characteristic majors, joint development of curriculum systems, co-construction of off-campus training bases, joint training of "double-qualified" teachers, joint research and development of technical projects and shared experimental equipment.

4.3. Initial formation of resource platform construction

Some regions and colleges have built vocational education resource platforms, promoting the preliminary sharing of curriculum resources, teaching videos, training projects and other resources. The application of digital

technology has laid a foundation for the interconnection of resources across regions and institutions.

5. Practical dilemmas and constraining factors

5.1. Incomplete institutional and mechanistic guarantee

There is a lack of unified regional coordination and management mechanism. Differences in systems, laws and regulations and educational standards among Guangdong, Hong Kong and Macao lead to poor interconnection of resources and high cooperation costs. The supporting policies such as incentive, supervision and evaluation are not perfect.

5.2. Insufficient resource integration and low sharing efficiency

High-quality resources such as high-level teachers, advanced training equipment, scientific research platforms and technical achievements are relatively scattered. The openness and sharing degree of resources are low, and the phenomenon of "resource island" is prominent, resulting in serious waste of resources and low utilization efficiency.

5.3. Weak initiative and sustainability of enterprise participation

Most enterprises lack long-term cooperation awareness and stable participation channels. The incentive mechanism for enterprises to invest resources, equipment and personnel is insufficient, and the rights and interests of enterprises cannot be effectively guaranteed, resulting in low enthusiasm for deep participation.

5.4. Unbalanced regional and institutional development

Resource distribution is unbalanced among different cities and between Guangdong, Hong Kong and Macao. The level of cooperation and resource sharing varies greatly, and it is difficult to form a coordinated development pattern of the whole region.

6. Innovation of the co-construction and sharing mechanism

6.1. Multi-agent collaborative governance mechanism

Establish a regional coordination leading group to clarify the roles of government, schools, enterprises and research institutions. Form a "government guidance, school main body, enterprise participation, research support" multi-agent pattern to achieve efficient communication and coordinated decision-making.

6.2. Resource integration and optimal allocation mechanism

Comprehensively integrate teacher resources, training bases, experimental equipment, curriculum system, scientific research projects, technical patents and other high-quality resources. Build a resource catalogue system and realize accurate matching between resource supply and demand through classification, sorting and standardized management. Improve the efficiency of resource utilization and avoid repeated construction and waste.

6.3. Benefit distribution and risk sharing mechanism

Establish a benefit distribution model based on resource contribution, investment proportion and benefit output. Clarify the distribution principle of intellectual property rights, technical achievements and economic benefits. At the same time, establish a risk identification, early warning, assessment and sharing system to balance interests and risks and ensure the stability of cooperation.

6.4. Policy support and supervision evaluation mechanism

Improve supporting policies such as financial subsidies, tax incentives, project approval and talent evaluation for industry-university-research cooperation. Establish a third-party supervision and performance evaluation system, carry out whole-process tracking and evaluation, and promote the continuous optimization of resource sharing effect through evaluation feedback.

7. Conclusion

This study analyzes problems in GBA vocational education resource co-construction and sharing, builds

five innovative mechanisms, and proposes implementation paths. It provides a reference for the high-quality development of regional vocational education.

Fundings

List of Projects Approved by the Vocational Education Research Branch of the Guangdong Higher Education Association in 2024 (General Projects) "Research on the Innovation of the Co-construction and Sharing Mechanism of Industry-University-Research Resources in Vocational Education in the Guangdong-Hong Kong-Macao Greater Bay Area".

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