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Vocational Education Empowering Rural Revitalization: Real-world Dilemmas, Mechanism Analysis, and Pathway Breakthroughs: A Case Study of Guangdong Province's "Bai-Qian-Wan" Project

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Abstract: Rural revitalization is the core mandate of the "Bai-Qian-Wan" Project and supporting this revitalization constitutes both a statutory duty and a policy imperative for vocational colleges and universities. At present, vocational education's capacity to empower rural revitalization is impeded by multiple dilemmas: insufficient coordination among stakeholders, the contraction of agriculture-related programs, an imbalanced allocation of resources, and a mismatch between skills training and local needs. Drawing on an analysis of the underlying empowerment mechanisms and situated within the strategic framework of Guangdong Province's "Bai-Qian-Wan" Project this study proposes a multi-actor collaborative governance model — integrating government, vocational institutions, enterprises, and township-village actors — guided by collaborative governance theory. Through program optimization, talent deployment to rural areas, skills upgrading, and institutional innovation, the model seeks to overcome the structural barriers inhibiting vocational education's contribution to rural revitalization and to sustain the efficient advancement of the "Bai-Qian-Wan" Project.

Keywords: vocational education, empowerment, rural revitalization

1. The Functional Positioning of Vocational Education in Empowering Rural Revitalization

1.1 Rural revitalization as a national development strategy

The countryside plays a pivotal role in the overall national socio - economic context and is crucial to the sustainable development of the nation's economy, ecology, and society (Zhu, 2024). The implementation of the Rural Revitalization Strategy is a comprehensive and historic task that is related to the overall construction of a modern socialist country. Adhering to the priority development of agriculture and rural areas and the implementation of the Rural Revitalization Strategy is a strategic decision made in response to the goals of the "Two Centenary Objectives" and the shortcomings in agriculture and rural areas. In April 2021, the Rural Revitalization Promotion Law of the People's Republic of China, hereinafter referred to as the Rural Revitalization Promotion Law, (Law of the People's Republic of China on Promoting Rural Revitalization, 2021), was officially implemented, providing legal guarantees for rural revitalization at the national level.

In February 2023, Guangdong Province made a decision to implement the "High - quality Development Project of Hundred Counties, Thousand Towns and Ten Thousand Villages" to promote coordinated urban - rural and regional development (Decision on Implementing the "High-Quality Development Project for 100 Counties,

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1,000 Towns, and 10,000 Villages" to Promote Coordinated Urban-Rural and Regional Development, 2023), which is abbreviated as the "Bai-Qian-Wan" Project. The project is led by national strategies such as rural revitalization, coordinated regional development, and new - type urbanization. It aims to build a new pattern of coordinated regional development through integrated urban - rural development and is the top - priority project for promoting high - quality development.

1.2 Vocational education as an important type of education in china

The Law of the People's Republic of China on Vocational Education, hereinafter referred to as the Vocational Education Law revised in 2022, (Law of the People's Republic of China on Vocational Education, 2022) clearly states that vocational education is an educational type that runs parallel to general education, emphasizing its core role in the national education system and human resource development. At present, China has established a modern vocational education system that meets the needs of socio-economic development, integrates industry and education in-depth, gives equal emphasis to vocational school education and vocational training, facilitates interconnectivity between vocational and general education, and ensures effective connection among different levels of vocational education.

Vocational education is implemented to cultivate highly qualified technical and skilled personnel, enabling learners to possess the professional ethics, scientific and cultural knowledge, professional knowledge, technical skills, and other comprehensive professional qualities and action capabilities required for career development. China is currently in a period of transforming its development model, promoting high-quality economic development, and upgrading its industries to the mid-to-high end. There is a great need for a large number of personnel with high quality and technical skills. Vocational education must take on the responsibility of improving the quality and technical skill levels of workers, and provide qualified technical and skilled personnel for the modernization of the country by cultivating highly qualified technical and skilled personnel.

1.3 Multi-Dimensional drivers of vocational education in empowering rural revitalization

As an important vehicle for serving regional economies, vocational education must accurately connect with local industrial demands and form differentiated development paths. From the perspectives of policy and law, regional economic development, and the inherent needs of social collaboration, it is a realistic necessity for vocational education to empower rural revitalization.

Firstly, the functions of vocational education are highly integrated with rural revitalization policies. Article 26 of the Rural Revitalization Promotion Law clearly states that "all levels of people's governments shall take measures to strengthen vocational education and continuing education." Vocational education is an important part of the national education system and human resource development, and is an important way to cultivate diverse talents, inherit technical skills, and promote employment and entrepreneurship. The functions of vocational education and rural revitalization policies determine that serving rural revitalization is an inescapable responsibility of vocational education.

Secondly, vocational education provides talent support for rural revitalization. Rural revitalization requires a large number of professional technical personnel who have technical skills, understand agriculture, and love rural areas. Vocational education can target the needs of rural industrial development and cultivate various types of technical and skilled personnel, such as agricultural technical personnel, rural tourism personnel, and rural e-commerce personnel, to provide a solid talent guarantee for rural revitalization.

Thirdly, vocational education promotes rural industrial development. Vocational education can promote the upgrading and innovative development of rural industries through technical services, innovation and entrepreneurship education, and other means. Vocational colleges and institutions provide

technical consultation and skills training for rural enterprises, help farmers conduct e-commerce business, and promote the processing and sales of agricultural products, thereby improving the economic benefits and competitiveness of rural industries.

Fourthly, vocational education inherits and promotes rural culture and improves rural social governance. Vocational education cultivates students' sense of identity and pride in rural culture, inherits and promotes excellent traditional rural culture, and injects cultural vitality into rural revitalization. Vocational education also cultivates rural governance talents, improves farmers' overall quality and awareness of democracy and the rule of law. Through community education, volunteer services, and other activities, vocational education promotes harmonious rural social development and improves rural social governance.

2. Challenges of Vocational Education in Empowering Rural Revitalization

In the new era of high-tech development, rural revitalization requires the support of new technologies and the participation of highly qualified labor force. At present, China has achieved significant results in rural revitalization. However, in the long-term development perspective, vocational education still faces many difficulties and problems that need to be considered and solved comprehensively.

2.1 Challenges in stakeholder collaboration

As a strategic fulcrum for rural revitalization, vocational education has the inherent advantages of connecting with industrial demands and deeply engaging with local needs. However, due to the constraints of traditional concepts and administrative barriers, the collaborative model is limited. Departments such as education, agriculture, and human resources and social security face overlapping responsibilities and misaligned incentives, making it difficult to form a collaborative network of "provincial coordination, city-county linkage, town-village implementation." Vocational colleges and institutions face difficulties in connecting with towns and villages, and it is hard to break through the existing collaborative governance model.

2.2 Challenges in agricultural education

Due to the relatively low professional identity of students in agricultural-related majors in vocational colleges and institutions, schools face difficulties in enrollment (Si, 2013). At present, rural revitalization requires a large number of professional technical personnel, while related vocational colleges and institutions are facing the dilemma of difficulties in enrolling students in agricultural-related majors. While traditional agricultural majors are shrinking, the application of digital technologies such as artificial intelligence, big data, and the Internet of Things in the field of digital agriculture has not yet been scaled up due to the lack of agricultural infrastructure. In terms of skills training, the content of rural vocational education and training in China still to some extent deviates from production practice, resulting in low learning gains and satisfaction among farmers.

2.3 Challenges in resource allocation

In recent years, the state has provided strong support for agricultural-related vocational colleges and institutions in terms of funding and equipment. However, there are still problems of insufficient and uneven distribution of agricultural-related resources. Nationally, the eastern region of China, with its more developed economy, has a significantly higher level of agricultural technology and stronger resources and faculty in vocational colleges and institutions than the western region (Chen & Chen, 2024). In Guangdong, the imbalance in resource distribution between the Pearl River Delta region and the eastern, western, and northern regions of Guangdong is also significant. The Pearl River Delta region has better modern agricultural resources and agricultural-related major resources in vocational colleges and institutions than the eastern, western, and northern regions of Guangdong.

2.4 Challenges in rural talent development

Modern agriculture requires a group of practitioners with good education. According to the

statistical data analysis of the 7th National Population Census, the total population aged 25 and above is about 1.01 billion people, with an average education duration of 9.46 years. However, the average education duration of the population aged 25 and above in rural areas is 7.78 years, which is 1.68 years lower than the national average. The data shows that the education level of Chinese farmers is far below that of developed countries, and the overall cultural quality of the farming community is relatively low, which will hinder the modernization level of China's agriculture and rural areas in the long run.

3. The Mechanism of Vocational Education Empowering Rural Revitalization

Rural revitalization is a great systematic project. Empowering rural revitalization through vocational education requires the participation of multiple parties to jointly build a multi-agent interactive mechanism. The co-governance theory is an emerging theory, which is the intersection of the Synergetics in natural science and the governance theory in social science. The most prominent feature of synergy is the mutual cooperation between subsystems, thereby generating new system structures and functions that cannot be achieved at the microscopic level (Li, 2014).

The core of the co-governance theory lies in breaking down the barriers of traditional single-agent governance. By integrating resources and coordinating actions among multiple agents such as the government, market, social organizations, and citizens, it achieves systematic governance goals. In the context of vocational education empowering rural revitalization, the relevance of this theory is reflected in three aspects:

Policy Orientation: The local rootedness of vocational colleges and institutions is transformed into an empowerment hub for rural revitalization through the integration of industry and education. It plays a core role in skill supply, technology promotion, and the revitalization of local culture. "Bai-Qian-Wan" Project is the "top project" for Guangdong to promote high-quality development, and rural revitalization is the core content of the "Bai-Qian-Wan" Project. Laws and regulations such as the Law of the People's Republic of China on Vocational Education and the Law of the People's Republic of China on Promoting Rural Revitalization endow vocational education with the statutory function of serving rural revitalization.

Demand Dimension: Rural revitalization involves multiple goals such as industrial upgrading, talent cultivation, cultural inheritance, and ecological protection, which are difficult for a single agent to address independently. Project promotion requires the government to introduce relevant policies, enterprises to invest capital and equipment, vocational colleges and institutions to provide technical training and professional talent cultivation, and villagers' cooperatives or farmers to participate. This is a typical scenario of co-governance.

Resource Allocation: The key to empowering rural revitalization through vocational education lies in promoting the systematic integration and flow of multiple elements across departments, fields, and levels. These elements include policy resources (laws and funds led by the government), technical resources (equipment and solutions provided by enterprises), educational resources (curriculum systems and faculty of colleges and institutions), and local resources (ecological assets and cultural accumulation of rural areas). This helps to break the resource island effect and achieve precise matching and collaborative added value between supply and demand.

Governance Efficiency: The co-governance theory emphasizes improving governance efficiency through institutionalized collaborative mechanisms, which is highly consistent with the demand of vocational education to break the dilemma of "closed-door schooling." Traditional vocational education serving rural revitalization often encounters problems such as the disconnection between professional settings and industrial demands, and the misalignment between training content and farmers' needs. Co-governance can effectively solve

these contradictions by establishing decision-making mechanisms involving multiple agents.

4. Breakthroughs in the Path of Vocational Education Empowering Rural Revitalization

Guangdong Province is a pioneer in rural revitalization nationwide. It has especially promoted the continuous development of rural revitalization through collaborative linkage, driving professional optimization, talent deployment to rural areas, skills training, and innovation of carriers.

4.1 Collaborative linkage and common development

Guangdong Province's "Bai-Qian-Wan" project has elevated collaborative linkage to a systemic engine. Through a three-dimensional mechanism of vertical integration and horizontal collaboration, it has built a new development ecosystem of "multi-agent co-governance and complementary resources across the region." The implementation plan of Guangdong Province's "Bai-Qian-Wan" project adheres to collaborative linkage, using industry to support agriculture, cities to lead rural areas, and promoting integrated urban-rural development through complementary urban and rural resources. It has established a pairing relationship between the Pearl River Delta core area and counties in Eastern, Western, and Northern Guangdong through vertical support from the provincial and municipal levels.

The Guangdong Province "High-Quality Development Project for 100 Counties, 1,000 Towns, and 10,000 Villages" Education Action Plan has taken the lead in launching collaborative linkage for the "Bai-Qian-Wan" project in the field of education. Colleges and universities within the province have successively formed teams to support rural revitalization. In April 2024, Guangdong University of Technology, Guangdong Polytechnic, and the People's Government of Yunan County held a meeting in Guangzhou University Town to support the "Bai-Qian-Wan" project through the linkage of 100 schools with 100 counties. They established a joint meeting system to boost rural revitalization in Yunan area.

4.2 Professional optimization and digital empowerment

Agricultural-related vocational colleges and institutions are the engines and main forces of rural revitalization. On the one hand, the Guangdong Provincial Department of Education has increased investment in agricultural-related vocational colleges and institutions to enhance their talent cultivation and social service capabilities. On the other hand, they have optimized agricultural-related majors and strengthened the application of new-generation information technology in rural construction. Taking Guangdong Agriculture, Business and Polytechnic College as an example, in 2024, the number of agricultural-related majors in the school increased to 18, accounting for 36% of the total number of majors offered by the school. The number of students enrolled in agricultural-related majors reached 6,348, accounting for 32.24% of the total number of students in the school.

Agricultural-related vocational colleges and institutions have fully utilized their training functions to conduct training in majors such as crop production and management, modern agricultural technology, horticultural technology, landscape technology, and intelligent food processing technology. Relevant colleges and institutions have scientifically designed training programs and courses related to rural revitalization. Through forms such as sending training to villages and teaching to households, they have vigorously carried out training for agricultural business operators, rural e-commerce talents, and agricultural brokers. In two years, they have trained 170,000 talents of various types.

Non-agricultural majors in vocational colleges and institutions also have great potential in rural revitalization. New-quality productive forces represented by new technologies such as artificial intelligence, big data, and the Internet of Things have participated in rural revitalization with their advantages in talent, technology, and equipment. Taking Zhongshan Polytechnic as an example, its artificial intelligence major has cooperated with local

agricultural science and technology enterprises. Through intelligent harvesting robots, fruits can be easily detached from branches, reducing labor costs and avoiding injuries from thorns, achieving intelligent agricultural product harvesting.

4.3 Project support and talent deployment to rural areas

Research on teaching and scientific research projects is an important way for vocational colleges and institutions to serve society. In recent years, the Guangdong Provincial Department of Science and Technology has set up a "modern seed industry" major project in the science and technology plan, with a cumulative investment of more than 200 million yuan in research funds. To further promote the rapid and efficient implementation of rural revitalization by vocational colleges and institutions, the Guangdong Provincial Department of Education and the Guangdong Provincial Department of Science and Technology have specifically set up a rural revitalization special project in the annual scientific research projects, and supported rural revitalization by increasing research funding and the number of scientific research projects.

To comprehensively promote the construction of rural revitalization talent teams, Guangdong Province has established an incentive mechanism for talents to enter counties and rural areas, strengthened the construction of talent service stations, and continuously promoted thousands of science and technology commissioners to serve in rural areas. The science and technology commissioner system integrates resources from colleges and universities, scientific research institutions, and enterprises to build a "multi-level, cross-field" science and technology commissioner team ("High-Quality Development Project for 100 Counties, 1,000 Towns, and 10,000 Villages" Bears Fruit in Science and Technology, 2025).

In terms of talent introduction and cultivation for rural revitalization, the rural and agricultural talent "introduction, evaluation, and training" model featured by Zhongshan's Fragrant Grass Plan has provided an innovative template for rural talent construction. The Fragrant Grass Plan of Zhongshan has started from three aspects and 18 measures to comprehensively accelerate the introduction, evaluation, training, and empowerment of talents for the "Bai-Qian-Wan" project in rural areas.

4.4 Social organization services and cultural promotion

The Guangdong Youth College Student "Bai-Qian-Wan" project Commando Team is the vanguard of Guangdong Province's "Bai-Qian-Wan" project. The Communist Youth League Committee of Guangdong Province has formulated a work plan for the Guangdong Youth College Student "Bai-Qian-Wan" project Commando Team. Based on the "Three to the Countryside" social practice activities, it organizes a thousand provincial commando teams in colleges and universities every year. Through the cooperation model of "county + university," it helps promote high-quality development in Guangdong.

The Communist Youth League Committee of Zhongshan City has established a practical education platform for college and university cooperation and a college student scientific and technological innovation practice transformation platform based on townships and streets through the "university + township" cooperation model. It has promoted more than 420 commando teams from colleges and universities inside and outside the city to pair up with townships, villages, factories, and industrial parks. It guides young students to devote themselves to the construction of the "Bai-Qian-Wan" Project closely integrating what they have learned in class with the high-quality development of counties, towns, and villages, and contributing their youth to rural revitalization.

4.5 Carrier innovation and sustainable development

Digital Hub for Integrated Urban-Rural Development: Guangdong Province has taken the lead in breaking down the barriers between urban and rural resources through the construction of digital platforms, creating a new type of digital hub that connects vocational education with rural

development. The province has launched the first national rural tourism service platform, which has attracted 300,000 registered users and over 1,000 merchants. It draws an average of 60,000 users daily to "virtually tour the countryside," successfully building a digital bridge that connects urban and rural resources.

Innovative Carriers for Industry-Education Integration through "University-Local Government Co-construction": The co-construction and sharing of physical platforms is an important direction for innovation in empowering rural revitalization through vocational education. Vocational colleges and institutions in Guangdong Province have joined hands with township governments to build integrated labor education bases. This collaboration has successfully created an innovative carrier that combines "university think tanks + local practice + resource revitalization."

Innovative Carriers for Technological Application through Smart Agriculture Demonstration Bases: Guangdong Province is driving the high-end integration of vocational education and rural industries by creating carriers for the application of smart agriculture technology. The province is planning and constructing "three zones and two centers" across the region, aiming to build 30 provincial smart agriculture parks and cultivate 100 smart agricultural machinery service organizations.

Conclusion

The core logic of Guangdong's vocational education empowering rural revitalization is "policy-driven - demand-led - function matching." In recent years, with the continuous implementation of rural revitalization policies, Guangdong Province has achieved breakthroughs through four-dimensional innovation in mechanisms, content, carriers, and guarantees. Empowering rural revitalization through vocational education has become an important achievement in the development of Guangdong's vocational education.

Guangdong Province still has a broader space for expansion in the field of vocational education empowering rural revitalization. Based on the development layout and professional characteristics of Guangdong's vocational education, it is necessary to further build a long-term mechanism for "three cycles" of vocational education empowering rural revitalization:

Promote the flow of vocational education (VE) resources from the Greater Bay Area to the eastern, western, and northern regions of Guangdong, and drive rural revitalization to a deeper level in the process of balancing VE resources. Explore the "skill - service points system," where rural households can exchange training resources with points, and vocational schools can obtain government support for running schools based on the volume of services provided, thus establishing a cycle of mutual benefits. Promote cultural circulation by incorporating Guangdong - specific intangible cultural heritage (ICH) projects such as "Kung Fu Tea Art" and "Cantonese Embroidery" into the curriculum standards to activate the intrinsic motivation of cultural identity.

Conflict of interest

The authors declare that they have no conflicts of interest in this work.

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References

Chen, J., & Chen, C. (2024). Study on the professional identity and influencing factors of agricultural-major students in vocational

colleges under the background of rural revitalization. *China Vocational and Technical Education, 2024*(24), 54–64.

Guangzhou Daily Online. (2025). "High-quality development project for 100 counties, 1,000 towns, and 10,000 villages" bears fruit in science and technology: 4,500 science and technology commissioners in Guangzhou drive an income increase of 5 billion yuan.

Li, H. (2014). Exploration of the theory of collaborative governance. *Theoretical Monthly, 2014*(1), 138–142.

National People's Congress. (2021). Law of the People's Republic of China on promoting rural revitalization.

National People's Congress. (2022). Law of the People's Republic of China on vocational education.

Si, Z. (2013). Analysis of the reasons and countermeasures for the difficulties in recruiting students for agricultural-related majors in higher vocational colleges. *Henan Agriculture, 2013*(8), 9–10.

South Daily Online. (2023). Decision on implementing the "high-quality development project for 100 counties, 1,000 towns, and 10,000 villages" to promote coordinated urban–rural and regional development. Guangdong Provincial Department of Housing and Urban–Rural Development.

Zhu, X. (2024). The value, dilemma, and path of empowering rural revitalization through talent revitalization. *Rural Economy and Technology, 2024*(4), 167–169.

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