

Exploration of the Characteristic Vocational Education Curriculum System in the Guangdong-Hong Kong-Macao Greater Bay Area Based on Industrial Demand

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Keywords: Guangdong-Hong Kong-Macao Greater Bay Area; vocational education; industrial demand; curriculum system

Abstract: As a nationally strategic development area, the Guangdong-Hong Kong-Macao Greater Bay Area has become a focus of national attention. With the continuous progress of regional integration, various industries in the area are developing rapidly. At the same time, higher education in the region is also undergoing rapid development, and vocational education plays an important role in it. Therefore, how to construct a vocational education curriculum system that meets the needs of industries is one of the key issues in the development of vocational education in the Guangdong-Hong Kong-Macao Greater Bay Area. This paper explores the construction of a characteristic vocational education curriculum system in the area based on industrial demand, aiming to provide effective ideas and references for the development of vocational education in the region.

1. Introduction

With the advancement of the construction of the Guangdong-Hong Kong-Macao Greater Bay Area, the economic integration and development in the region have become important topics. Vocational education, as an important way to cultivate technical and skilled talents, plays a crucial role in the development of the Greater Bay Area. However, traditional vocational education curriculum systems often face issues such as being disconnected from industrial demand and insufficient practical abilities of students. Therefore, constructing a vocational education curriculum system that aligns with the characteristics of the Greater Bay Area and meets the needs of industries has become a current research focus and concern.

2. Economic and Industrial Demand in the Guangdong-Hong Kong-Macao Greater Bay Area

The Guangdong-Hong Kong-Macao Greater Bay Area, as a key national strategic development region, aims to promote economic cooperation and integration among Guangdong, Hong Kong, and Macao. As an economic powerhouse, the Greater Bay Area possesses vast market potential and diverse industrial demand. The economic and industrial demand in the Guangdong-Hong Kong-

Macao Greater Bay Area includes the following aspects:

2.1. Information Technology and Innovation Industry

In the digital era, the development of information technology and innovation industry is crucial to the economic growth of the Greater Bay Area. The area needs to establish more high-level research and development centers and innovation incubators, attract outstanding domestic and international research talents and entrepreneurial teams, and cultivate high-tech companies with international competitiveness.[1] These enterprises and teams need to continuously innovate and make breakthroughs in fields such as cloud computing, artificial intelligence, and intelligent manufacturing, providing technological support and driving innovation for the industrial upgrading in the Greater Bay Area. Furthermore, the Greater Bay Area should strengthen cooperation with international technology and innovation centers, introduce cutting-edge technologies and innovative concepts, and strive to become one of the leading global innovation centers.

2.2. Environmental Protection and Sustainable Development

With the increasingly severe environmental problems caused by global climate change, the demand for environmental protection and sustainable development in the Greater Bay Area has become more urgent. To achieve sustainable development and a green economy, the Greater Bay Area needs to increase investment in areas such as clean energy, environmental monitoring technology, and energy conservation and emission reduction. At the same time, it is necessary to enhance ecological environmental protection, improve air quality, water quality, and soil pollution, and provide residents with a better living environment. To achieve sustainable development, the Greater Bay Area should encourage enterprises to enhance environmental awareness, promote sustainable production methods, and promote the harmonious development of the economy, society, and environment.[2]

2.3. Financial Services Industry

As one of China's and even the world's financial centers, the Greater Bay Area has unique advantages in financial services. To further develop the financial services industry, the area needs to attract more international banks, insurance companies, and financial institutions to establish branches, providing comprehensive financial services. At the same time, the Greater Bay Area should foster the development of local financial institutions, improve financial innovation capabilities and risk management levels, and provide more convenient and efficient financial support for the real economy.[3] To ensure the stability and security of financial services, the Greater Bay Area needs to strengthen regulation and risk prevention, improve the financial legal system, and enhance the transparency and credibility of the financial industry.

2.4. Modern Logistics and Transportation Infrastructure

Located in the southern coastal region of China, the Greater Bay Area is an important logistics and transportation hub. To meet the growing demands for goods circulation and personnel mobility, the area needs to enhance the operational efficiency and service quality of ports, airports, railways, highways, and other transportation facilities, constructing an efficient and convenient logistics system. Furthermore, the Greater Bay Area should strengthen the construction of logistics informatization, promote Internet of Things (IoT) technologies and intelligent logistics systems, and improve logistics efficiency and service quality. Additionally, the area needs to enhance urban transportation planning

and construction, promote public transportation, reduce private car usage, and improve the safety and convenience of urban transportation.[4]

2.5. Cultural and Creative Industries

The Greater Bay Area possesses a long history and rich cultural heritage, and cultural and creative industries are essential components of its economic development. The area needs to provide greater support for cultural and creative industries, nurturing more cultural enterprises and creative projects. By protecting and inheriting local culture, the Greater Bay Area can create internationally influential cultural brands and promote the integration of culture and economy. To facilitate the development of cultural and creative industries, the area needs to establish more cultural and creative parks and districts, provide a range of policies and funding support, and encourage entrepreneurs and business leaders to innovate and start ventures here. Additionally, the Greater Bay Area should strengthen the integration of cultural and creative industries with other industries, promote the upward expansion and outward extension of cultural and creative industries, and inject new impetus and vitality into economic development.[5]

2.6. Talent Attraction and Innovation and Entrepreneurship Environment

The Greater Bay Area needs to attract more domestic and international talents, especially high-level talents and innovative and entrepreneurial talents. To attract talents, the area needs to increase policy and financial support, establish a more complete talent evaluation mechanism and talent cultivation system, and enhance the sense of acquisition and belonging among talents. Simultaneously, the Greater Bay Area should create a favorable environment for innovation and entrepreneurship, providing more convenient and efficient services for innovators and entrepreneurs, including incubation, technological support, and financial assistance. To improve the success rate of innovation and entrepreneurship, the area also needs to strengthen innovation and entrepreneurship education and training, enhance the entrepreneurial qualities and innovative capabilities of entrepreneurs, and lay a solid foundation for the innovation and entrepreneurship ecosystem in the Greater Bay Area.[6]

3. Requirements of Special Industries in the Guangdong-Hong Kong-Macao Greater Bay Area for Vocational Education

3.1. Finance and Capital Markets

As an important financial center, the Guangdong-Hong Kong-Macao Greater Bay Area has put forward a series of requirements for vocational education. Firstly, vocational education needs to integrate financial theory with practice, cultivating students' understanding of financial market operations and financial product innovation through case-based teaching and practical operations, thereby enhancing their practical abilities. Secondly, students need to possess cross-border financial service capabilities, including an international perspective and skills in cross-border financial business, to meet the needs of economic integration in the Greater Bay Area, such as cross-border fund flows, cross-border payments, and financial risk management. Additionally, vocational education should focus on cultivating students' risk management and compliance awareness, enabling them to have the ability to manage risks and operate in compliance with financial regulations.

3.2. Information Technology and Artificial Intelligence

The development of the Guangdong-Hong Kong-Macao Greater Bay Area relies on information

technology and artificial intelligence, which impose certain requirements on vocational education. Firstly, students need to have awareness of network security and skills in data privacy protection to deal with risks such as cyber-attacks and information leakage. Secondly, vocational education needs to cultivate students' data analysis and artificial intelligence application skills, including knowledge and practical abilities in big data processing, machine learning, and deep learning. Such training enables students to be competitive in the era of big data. Furthermore, students also need to develop cross-disciplinary integration and innovation capabilities, encouraging them to apply information technology and artificial intelligence to the development of other fields.

3.3. Environmental Science and Sustainable Development

The Guangdong-Hong Kong-Macao Greater Bay Area is committed to promoting environmental science and sustainable development, which brings forth a series of requirements for vocational education. Firstly, vocational education needs to cultivate students' environmental protection awareness and environmental management skills, enabling them to participate in environmental monitoring, wastewater treatment, pollution prevention, and other related work, equipped with relevant knowledge and practical abilities. Secondly, students need to master the application of renewable energy and clean technologies to promote sustainable development. Vocational education should foster students' understanding and application abilities regarding renewable energy and clean technologies, enabling them to make contributions in relevant fields. Additionally, vocational education should focus on cultivating students' innovation capabilities, encouraging them to engage in research and practice in the fields of environmental science and sustainable development, and contribute to the sustainable development of the Greater Bay Area.

3.4. Advanced Manufacturing and Logistics

Driven by globalization and technological advancements, advanced manufacturing and logistics industries have become crucial for the Guangdong-Hong Kong-Macao Greater Bay Area's economic development. Vocational education in this field needs to emphasize the integration of manufacturing and logistics theories with practical applications, cultivating students' understanding and application capabilities in advanced manufacturing and logistics technologies. Regarding manufacturing, vocational education should focus on developing students' mechanical design and manufacturing abilities, including the application of software like CAD and CAM. Furthermore, vocational education should emphasize the cultivation of innovation capabilities, encouraging students to conduct research and practice in the manufacturing field and provide more technological support for the manufacturing industry in the Greater Bay Area. Regarding logistics, vocational education needs to enhance students' abilities in cross-border logistics and supply chain management to meet the needs of economic integration in the Greater Bay Area. Students should possess an international perspective on logistics and skills in cross-border supply chain management, effectively coordinating and managing the entire supply chain to improve logistics efficiency and reduce costs.

3.5. Cultural and Creative Industries

The cultural and creative industries are essential pillars of the Greater Bay Area's economy. Vocational education in this field needs to focus on cultivating students' abilities in cultural creativity and innovation, enhancing their entrepreneurial spirit and market development capabilities. For cultural creativity, vocational education should emphasize the cultivation of students' abilities in cultural creative design and marketing, including brand planning, market research, and promotion. Additionally, vocational education should foster innovation capabilities, encouraging students to

engage in research and practice in the field of cultural and creative industries, providing more technological support and innovative ideas for the cultural and creative industries in the Greater Bay Area. Regarding tourism, vocational education needs to emphasize the cultivation of students' abilities in cross-cultural communication and tourism management to meet the cultural exchange and tourism demands in the Greater Bay Area. Students should possess an international perspective and skills in cross-border tourism operations, effectively coordinating and managing the entire tourism journey to improve tourism quality and customer satisfaction.

4. Strategies for Constructing a Vocational Education Curriculum System Based on Industry Demands in the Guangdong-Hong Kong-Macao Greater Bay Area

To meet the demands of the Guangdong-Hong Kong-Macao Greater Bay Area's characteristic industries, it is necessary to construct a vocational education curriculum system that aligns with the region's industrial development. This article proposes strategies for constructing a vocational education curriculum system in the Greater Bay Area based on industry demands, talent cultivation, teaching methods and approaches, and faculty development.

4.1. Analysis of Industry Demands

4.1.1. Advanced Manufacturing and Logistics

As crucial pillars of the Greater Bay Area, advanced manufacturing and logistics require support from highly skilled and qualified talents. To meet industry demands, vocational education needs to construct a curriculum system with a focus on advanced manufacturing and logistics. In terms of curriculum design, it is important to integrate theory with practice, cultivating students' cross-border logistics and supply chain management abilities, as well as fostering their innovation capabilities. Additionally, practical teaching should emphasize providing a range of innovative projects and practical opportunities to help students improve their practical and innovative abilities.

4.1.2. Cultural and Creative Industries and Tourism

The cultural and creative industries and tourism are important pillars of the Greater Bay Area's economy, requiring support from highly skilled and qualified talents. To meet industry demands, vocational education needs to construct a curriculum system with a focus on cultural and creative industries and tourism. In terms of curriculum design, it is important to emphasize cultural creative design and marketing abilities, cultivating students' cross-cultural communication and tourism management abilities, as well as fostering their innovation capabilities. Additionally, practical teaching should emphasize providing a range of innovative projects and practical opportunities to help students improve their practical and innovative abilities.

4.2. Talent Cultivation Strategies

4.2.1. Integration of Theory and Practice

Vocational education needs to integrate theoretical knowledge with practical abilities, cultivating students' practical and innovative capabilities. In the teaching process, it is important to emphasize the imparting of theoretical knowledge while placing equal emphasis on practical teaching to enhance students' practical and innovative abilities. Practical teaching should involve providing a range of innovative projects and practical opportunities to help students improve their practical and innovative abilities.

4.2.2. Cross-border Communication Skills

With the economic integration in the Greater Bay Area, cross-border communication skills have become an important requirement for talent development. Vocational education needs to focus on cultivating students' cross-border communication skills, including an international perspective and skills in cross-cultural communication. Students need to be able to effectively coordinate and manage cross-border business, improve their communication and negotiation skills in an international environment.

4.2.3. Innovation Capability Development

In the characteristic industries of the Greater Bay Area, innovation capability is essential. Vocational education needs to focus on cultivating students' innovation capabilities, encouraging them to engage in research and practice in various fields. To achieve this, the curriculum system needs to emphasize practical teaching and provide a range of innovative projects and practical opportunities to help students improve their practical and innovative abilities.

4.3. Teaching Methods and Approaches

4.3.1. Industrial-oriented Teaching

Industrial-oriented teaching is a teaching model that combines the teaching process with industrial practice. In the cultivation of characteristic industries in the Greater Bay Area, vocational education should adopt industrial-oriented teaching methods, allowing students to learn through practice, thereby improving their practical and innovative abilities. Vocational education can collaborate with industrial enterprises, enabling teachers to gain in-depth understanding of industry development trends and demands. This collaboration can help adjust curriculum design and teaching methods in a timely manner to improve students' practical and employability skills. Additionally, practical projects and skill training provided by industrial enterprises can offer teachers practical experience and professional knowledge, enhancing their industrialization qualities.

4.3.2. Information Technology-based Teaching

Information technology-based teaching is a teaching model that utilizes modern information technology to deliver instruction. In the cultivation of characteristic industries in the Greater Bay Area, vocational education needs to adopt information technology-based teaching methods to equip students with modern information technology skills and improve their information literacy and innovative capabilities. Vocational education can establish online education platforms and virtual laboratories to provide online teaching and virtual practice projects. Additionally, modern information technology can be utilized to provide real-time industry information and skill training to students.

4.4. Faculty Development

4.4.1. Industry-oriented

The faculty team of vocational education needs to possess industry-oriented qualities, understanding industry development trends and demands. Through strengthening cooperation with industrial enterprises, vocational education can help teachers gain in-depth understanding of industry development trends and demands, enabling timely adjustments to curriculum design and teaching methods to enhance students' practical and innovative abilities. Additionally, the practical projects and skill training provided by industrial enterprises can offer teachers practical experience and

professional knowledge, enhancing their industrialization qualities.

4.4.2. Interdisciplinary

Vocational education can enhance teachers' interdisciplinary qualities through cross-disciplinary training and research. Specifically, vocational education can offer cross-disciplinary courses, inviting experts from different fields to teach and guide, improving teachers' interdisciplinary qualities. Simultaneously, vocational education can encourage cross-disciplinary research, supporting teachers in conducting research and innovation across disciplines to improve their cross-disciplinary abilities and qualities.

5. Future Development Directions of Vocational Education Curriculum in the Guangdong-Hong Kong-Macao Greater Bay Area Based on Industry Demands

5.1. Innovation and Entrepreneurship Education

In the future, the Guangdong-Hong Kong-Macao Greater Bay Area will continue to emphasize innovation and entrepreneurship, which is also a direction that vocational education curriculum needs to strengthen. Innovation and entrepreneurship education is an important approach to cultivating talents with innovative spirit and entrepreneurial abilities. Vocational education should focus on innovation and entrepreneurship education in curriculum design, cultivating students' innovative thinking, teamwork, and practical operational abilities. By offering entrepreneurship practice courses, organizing entrepreneurship competitions and entrepreneurial training, vocational education can inspire students' entrepreneurial enthusiasm and develop their abilities for innovation and entrepreneurship in the Greater Bay Area. Additionally, vocational education should strengthen cooperation with enterprises, integrating practical teaching with industry demands, enabling students to master the core skills of innovation and entrepreneurship through practical experiences.

5.2. Application of Intelligent Technologies

The future development of the Guangdong-Hong Kong-Macao Greater Bay Area will continue to promote intelligent technologies, which is a direction that vocational education curriculum needs to follow closely. Intelligent technologies involve fields such as artificial intelligence, big data, and the Internet of Things, which have become essential support for future economic development. Vocational education should focus on cultivating students' abilities in the application of intelligent technologies in curriculum design. By offering specialized courses in intelligent manufacturing, data analysis, and processing, vocational education can develop students' capabilities for technological innovation and application, enabling them to adapt to the demands of the intelligent technology era. Additionally, vocational education should strengthen cooperation with enterprises, integrating curriculum design and practical teaching with industry demands, allowing students to master the core skills of intelligent technologies through practical experiences.

5.3. Cross-border Collaboration and Communication

As an international economic cooperation region, the Guangdong-Hong Kong-Macao Greater Bay Area will continue to strengthen collaboration and communication with international partners in the future. Vocational education curriculum should include foreign-related courses to cultivate students' international perspectives and cross-cultural communication abilities. Through curriculum design and practical teaching, students can learn the basic principles and rules of international economic cooperation, and develop their international thinking and cross-cultural communication abilities.

Furthermore, establishing cross-border collaborative projects, such as student exchanges and joint practical training, provides students with opportunities to interact and collaborate with international partners, enhancing their global competitiveness. This not only broadens students' international perspectives but also provides more international support for the economic development of the Greater Bay Area.

5.4. Green and Sustainable Development

In the future, the Guangdong-Hong Kong-Macao Greater Bay Area will place more emphasis on green and sustainable development, which is an important aspect to be incorporated into vocational education curriculum. Green and sustainable development involves areas such as environmental protection and energy and is a crucial direction for future economic development. Vocational education should integrate the concept of green and sustainable development into curriculum design, cultivating students' environmental protection awareness and technical abilities for sustainable development. By offering courses in environmental engineering, new energy technologies, etc., students can understand the development trends of green technologies and industries, contributing talents and technological support to the sustainable development of the Greater Bay Area. Additionally, vocational education should strengthen cooperation with enterprises, integrating practical teaching with industry demands, enabling students to master the core skills of green technologies through practical experiences.

6. Conclusion

The development of vocational education curriculum in the Guangdong-Hong Kong-Macao Greater Bay Area based on industry demands requires close cooperation between vocational education institutions and industry enterprises. It also necessitates strengthening the construction of the teaching staff, continuously advancing curriculum reforms, and innovating teaching methods to make greater contributions to the cultivation of highly skilled talents with practical abilities, innovative capabilities, and international competitiveness.

Acknowledgement

Research on the construction of characteristic higher vocational education system in the Guangdong-Hong Kong-Macao Greater Bay Area (2021GXJK125).

References

- [1] Li Xiaowen, Shi Weiping. *Logic, Challenges, and Paths of Optimizing the Structure of Vocational Education under the Background of High-Quality Development*[J]. *Research in Higher Education of China*, 2023(04): 102-108.
- [2] Li Zhengbiao, Tian Tian. *Research on the Dynamic Adjustment Mechanism of Vocational Education Majors Based on Regional Industrial Demands*[J]. *Journal of Yueyang Vocational and Technical College*, 2022, 37(05): 1-8.
- [3] Jin Jing. *Core Literacy Structure Model and Cultivation Path of Vocational Finance Majors in the Digital Era: An Examination of Vocational Education Supply from the Perspective of Industrial Demands*[J]. *Vocational and Technical Education*, 2022, 43(17): 35-39.
- [4] Wang Xu, Ye Hongying. *Exploration of Talent Training Mode Innovation in Vocational Education from the Perspective of Industry-Education Integration*[J]. *Theory Research and Practice of Innovation and Entrepreneurship*, 2022, 5(11): 122-125.
- [5] Wu Yiqun, Wang Qi. *Resolving the Structural Contradictions between the Supply of Vocational Education and Industrial Demands: The Practice of Mixed Ownership Reform in the "Cross-Border School-Enterprise Community" of Nantong Shipping Vocational and Technical College*[J]. *Jiangsu Education*, 2019(20): 24-28.
- [6] Su Meiling. *Research on Strategies for the Development of Regional Vocational Education Based on Industrial Demands*[D]. *Huaqiao University*, 2015.