

Research on the Coordinated Development of Hubei Higher Vocational Professional Setting and Industry

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Abstract: This study focuses on the coordinated development of Hubei's higher vocational education professional setting and industry, deeply analyses the current situation of Hubei's industrial structure development, the current situation of higher vocational colleges and universities' professional setting, explores the degree of fit between the professional setting and industrial demand and the problems, then proposes the implementation of the precise docking industry demand, deepen the integration of industry and education, strengthen the policy guidance and support and improve the evaluation system of talents and other optimization countermeasures, such as countermeasures, with a view to providing theoretical guidance and practical guidance for Hubei to In order to provide theoretical and practical guidance for Hubei higher vocational education to better serve industrial development. The study finds that there is a certain gap between Hubei's higher vocational professional settings and industrial docking, and through the implementation of a series of optimisation initiatives, it is expected to enhance the synergy between the two and promote the high-quality development of the regional economy.

Keywords: Hubei Higher Vocational; Professional Setting; Industrial Structure; Coordinated Development

1. Introduction

As an important part of higher education, higher vocational education shoulders the important task of cultivating high-quality skilled talents for the society [1]. The coordinated development of its professional settings and regional industries is of paramount importance in boosting local

economic advancement and enhancing industrial structure. As an important economic province in the central region, Hubei Province, in the process of industrial structure transformation and upgrading, has increasingly diversified the demand for higher vocational professionals. An in-depth study of the coordinated development of Hubei's higher vocational professional settings and industries will help improve the allocation efficiency of higher vocational education resources, enhance the ability of higher vocational colleges and universities to support the advancement of local economy and society, and at the same time provide a useful reference for other regions.

2. Status of Development of Industrial Structure in Hubei Province

2.1 Overview of the General Industrial Structure

In recent years, the industrial structure of Hubei Province has been continuously optimised and upgraded, and according to the data of 2023, the industrial structure of Hubei Province is 9.1:36.2:54.7, i.e., the primary industry accounts for 9.1%, the secondary industry accounts for 36.2%, and the tertiary industry accounts for 54.7% (e.g., Figure 1. Percentage of industrial structure in Hubei Province). The primary industry has been developing steadily, the level of agricultural modernisation has been improving, and the agricultural products processing industry is moving towards deep processing. In the secondary industry, traditional manufacturing industries, such as automobile manufacturing, iron and steel metallurgy, etc., continue to improve the added value of products and market competitiveness through technological transformation and innovation; at the same time, emerging industries, such as electronic information, biomedicine, high-end equipment

manufacturing, etc., are rapidly emerging and have become a new engine of economic development. The tertiary industry is developing strongly, with modern service industries such as finance, logistics and information technology services flourishing, and the cultural tourism industry, with its rich historical and cultural resources and natural landscape advantages, showing great potential and gradually increasing its share in the national economy [2].

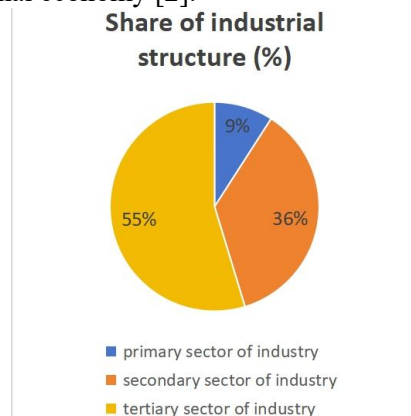


Figure 1. Percentage of Industrial Structure in Hubei Province

2.2 Development Trends and Characteristics of Major Industries

2.2.1 Manufacturing

Automobile industry accelerates the transformation around new energy, intelligent network connection and other directions, with remarkable industrial cluster effect and perfect supporting system of parts and components; electronic information industry focuses on optical communication, semiconductor display and other fields, with active technological innovation and continuous expansion of industrial scale, attracting a large number of upstream and downstream enterprises to gather.

2.2.2 Services sector

The financial service industry continues to innovate financial products and service modes, helping the development of the real economy; the modern logistics industry builds an efficient logistics and distribution network based on the advantages of traffic location and information technology; the information technology service outsourcing industry undertakes domestic and foreign business transfers and develops rapidly, forming a group of enterprises with international competitiveness.

2.2.3 High-tech industry

Biomedical field in the new drug research and development, medical equipment manufacturing and other aspects of breakthroughs, industrial park construction accelerated; high-end equipment manufacturing in aerospace, marine engineering equipment and other high-end areas of active layout, technology research and development capabilities and manufacturing level in the domestic leading position.

3. The Current Situation of Professional Settings in Hubei Province's Higher Vocational Colleges and Universities

3.1 General Situation of Specialisation

Hubei Province boasts numerous institutions within the scope of vocational higher education, with a wide range of professional settings covering engineering, medicine, finance and economics, tourism and many other disciplines. At present, the province's vocational schools have opened a total of 4,498 professional points, involving 619 majors in 19 major categories, basically covering all areas of economic and social development in the province and adapting to the changing needs of the human resources market in the province. Among them, engineering majors accounted for a large proportion, this aligns well with Hubei Province's industrial structure, which is predominantly centered around the manufacturing sector, but some of the majors such as machinery manufacturing, electronic information and so on, there is a more serious homogenisation of the phenomenon of the problem. Liberal arts majors, accounting, marketing and other traditional professional enrollment scale, while the emerging cultural industry management, digital media arts and other professional development is relatively lagging behind.

3.2 Differences in the Specialisation of Different Types of Tertiary Institutions

3.2.1 Comprehensive higher education institutions

The professional settings are more complete, focusing on the cross-fertilisation of disciplines, and in addition to the traditional advantageous majors, it also actively expands the emerging professional fields, such as the

opening of big data technology, artificial intelligence and other majors, in order to meet the diversified social demand for talents. For example, Wuhan Institute of Vocational Technology, its electromechanical integration, computer network technology and other specialities have a high reputation in the region, while new specialities such as new energy automobile technology have been added to keep pace with industrial development.

3.2.2 Industry-based tertiary institutions

They set up specialisations closely around specific industries or trades, and their specialisations have distinctive features. For example, the Hubei Institute of Transportation Vocational and Technical College, which focuses on transport specialities, covers road and bridge engineering technology, logistics management and other specialities, and has cultivated a large number of professional and technical talents for the transport industry; the Wuhan Shipbuilding Institute of Vocational and Technical College focuses on shipbuilding, navigation technology and other specialities, and has formed a unique professional advantage in ship repairing and related fields.

3.3 The "Bias" in Science and Engineering Education Contributes to the Development of "Smart" Manufacturing

In the process of optimising vocational education, Hubei Province has shown a significant "bias" towards science and engineering, and has become an important force in promoting "China's intellectual creation". In the "higher vocational ranking list", Hubei on the list of 44 colleges and universities, science and technology institutions accounted for as high as 61.4 per cent, far more than other provinces. In particular, Wuhan Institute of Vocational Technology and other 7 institutions in the national ranking of polytechnic higher vocational rankings in the top 100, showing the overall advantage of Hubei polytechnic higher vocational education. In addition, Hubei higher vocational new professional settings closely match the demand for intelligent manufacturing, such as equipment manufacturing, electronic information, energy power and materials, etc. A large number of professional additions. 2022, Hubei put forward the goal of establishing 'three

highlands and two bases', with the province's 33 vocational colleges and universities offering direct services to the '51020' modern industry cluster through their 62 specialized programs, and the "51020" modern industry, the vocational institutions of higher education within the province. The '51020' industrial system has facilitated the seamless integration of vocational education with the industrial chain. This mode of "industry-university-research" combination not only improves the quality of higher vocational education, but also conveys a large number of high-quality skilled talents for Hubei's intelligent manufacturing industry.

4. Analysis of the Fit between Professional Settings and Industrial Needs

4.1 Match between Specialisation and Industrial Structure

Through an in-depth comparative analysis of the industrial structure of Hubei Province and the professional settings of higher vocational colleges and universities, we found that some traditional industries related to professional and industrial demand seems to be basically matched on the surface, but in fact there are some deep structural contradictions [3]. Take the manufacturing industry as an example, its demand for high-skilled CNC machining talents continues to flourish, but some of the higher vocational colleges and universities of the CNC profession in the curriculum and practical teaching links, but failed to keep pace with the pace of technological updating of enterprises. Specifically, the curriculum content of some institutions is too theoretical, and the practical teaching links are relatively weak, resulting in a significant disconnect between the knowledge and skills learned by students and the actual needs of enterprises. This disconnect not only affects the employment quality of students, but also restricts the transformation and upgrading of the manufacturing industry [4].

In the realm of emerging industries, the rapid advancements in technologies such as artificial intelligence and big data have led to a surge in demand for professionals within these sectors [5]. However, higher vocational colleges and universities have encountered delays in establishing faculty and training facilities tailored for these nascent professions. The

scarcity of high-quality educators and state-of-the-art practical training equipment poses significant challenges in nurturing the talent required by emerging industries. Consequently, the scale and quality of talent cultivation fall short of meeting the demands of industrial growth [6]. This disparity not only hinders the pace of development within emerging industries but also impacts the employment rates and societal standing of higher vocational colleges and universities.

4.2 Evaluation of the Supporting Role of Specialised Settings for Industrial Development

In the process of upgrading traditional industries, the relevant majors of higher vocational colleges and universities have provided certain technical support and talent protection for enterprises by adjusting the curriculum system and strengthening practical teaching [7]. Taking textile and garment higher vocational colleges and universities as an example, these colleges and universities have jointly researched and developed new fabrics and clothing styles through industry-university-research cooperation projects with enterprises, which has promoted the fashionable and branding development of the textile and garment industry. This close partnership not only enhances the market competitiveness of enterprises, but also promotes the improvement of the quality of education in higher vocational colleges and universities.

However, in the field of emerging industries, the leading and supporting role of higher vocational colleges and universities in industrial development has not been given full play due to the insufficient convergence between professional settings and industrial demand. Take the new energy automobile industry as an example, the industry has been developing rapidly in recent years, and the demand for professional talents is growing. However, there are many deficiencies in the training of talents in higher vocational colleges and universities specialising in new energy vehicles. On the one hand, due to the lack of advanced practical training equipment and high-quality teaching staff, higher vocational colleges and universities are difficult to cultivate high-quality talents in line with the needs of the industry; on the other hand, due to

the failure of the professional settings and course content to keep pace with the development of the industry in a timely manner, resulting in a lack of competitiveness of graduates in the employment market. This situation not only restricts the further expansion of the new energy automobile industry, but also affects the social recognition and employment rate of higher vocational colleges.

4.3 Impact of Changes in Industrial Demand on the Establishment of Specialisations

With the continuous adjustment and upgrading of the industrial structure in Hubei Province, the changes in industrial demand have had a profound impact on the professional settings of higher vocational colleges and universities. On the one hand, the rise of emerging industries prompts higher vocational colleges and universities to accelerate the pace of declaration and construction of new majors. For example, with the wide application of drone technology and the continuous development of industrial robot technology, new majors such as drone application technology and industrial robot technology have emerged. The establishment of these new majors not only meets the demand for professionals in emerging industries, but also brings new development opportunities for higher vocational colleges and universities.

On the other hand, the technological upgrading of traditional industries also requires higher vocational colleges and universities to transform and optimise the relevant professions. For example, in the field of machinery manufacturing, with the introduction of intelligent manufacturing and industrial Internet technology, the traditional machining profession needs to be transformed and upgraded to adapt to the new technical requirements. For this reason, some higher vocational colleges and universities have combined CNC machining technology with industrial robot application to create an intelligent CNC machining professional direction. This transformation not only improves the employment competitiveness and career development potential of students, but also cultivates a group of talents with the ability to apply new technologies and processes for enterprises.

5. Main Optimisation Measures for the Professional Structure

5.1 Accurately Matching Industrial Demand and Comprehensively Optimising the Professional Structure

Hubei Province should closely combine the characteristics of the regional economy and the situation of demand for technical and skilled talents to comprehensively optimise the professional structure of higher vocational colleges and universities. First of all, the professional structure should be dynamically adjusted around the development and extension of the industrial chain to ensure that the professional settings are closely aligned with the development of regional industries. Specifically, for the strategic emerging industries such as intelligent manufacturing, optoelectronic information, biomedicine and so on, which are the key development of Hubei Province, relevant specialities such as intelligent control technology, optoelectronic information science and engineering, biopharmaceutical technology and so on should be added or strengthened in order to meet the demand for high-skilled talents in these fields. Meanwhile, for traditional industries such as automobile manufacturing and food processing, the relevant professional settings should also be continuously optimised to enhance the relevance and adaptability of the training of skilled personnel. This includes strengthening the connotation construction of specialisations, improving the quality of specialised teaching, as well as promoting the transformation and upgrading of traditional specialisations to make them more in line with the needs of modern industrial development. In addition, support should be stepped up for the arduous specialisations where there is a shortage of technical and skilled personnel. Through policy guidance and financial investment, higher vocational colleges and universities are encouraged to open or expand the scale of relevant specialisations, so as to meet the demand for highly skilled talents in industrial development. At the same time, a mechanism for dynamic adjustment of specialisations should be established to adjust the specialisation settings in a timely manner according to the development trend of industries and market demand, so as to ensure

the synchronous updating of higher vocational education and industrial development.

5.2 Deepen the Integration of Industry and Education and Build a New Ecology of School-Enterprise Co-Operation

The alignment of higher vocational education with industry can be significantly advanced through the integration of industry and education. Hubei Province should vigorously promote such integration, fostering school-enterprise collaboration and establishing a collaborative educational framework that encompasses the government, enterprises, educational institutions, and other stakeholders. On one hand, the government must enact policies that incentivize enterprises to deeply engage in vocational education. This can be achieved by effectively merging educational and industrial resources through the establishment of training centers, joint training programs, customized classes, and other collaborative formats. Additionally, the government should bolster investments in industry-education integration, offering robust policy backing and financial support for school-enterprise partnerships.

On the other hand, higher vocational colleges and universities should proactively align their curricula with enterprise demands, refining talent training programs and optimizing course structures. This involves reinforcing practical teaching components to enhance students' hands-on skills and professionalism, collaborating with enterprises on scientific research projects to deepen industry-university-research integration, and instituting long-term cooperation mechanisms to ensure the sustainability and stability of school-enterprise partnerships. Furthermore, organizational bodies dedicated to industry-education integration, such as the Industry-Education Integration Alliance and Vocational Education Consortia, should be established [8]. These bodies should facilitate collaboration among vocational institutions, local governments, and industrial enterprises in nurturing talent in key technologies, fostering scientific and technological innovation, and developing academic and professional disciplines. Through active engagement and comprehensive integration, a shared community of interest between schools and enterprises can be forged, jointly driving

the deep integration of higher vocational education and industrial development.

5.3 Strengthen Policy Guidance and Support and Optimise Resource Allocation Mechanisms

To enhance the development of higher vocational education and its integration with industry, the government must offer more policy-level guidance and support. Initially, it is crucial to refine policies and regulations concerning industry-education integration, delineating clear responsibilities and obligations for all stakeholders and ensuring the seamless execution of this integration [9]. Concurrently, a targeted and effective incentive mechanism should be established to spur enterprises' active engagement in vocational education by leveraging financial subsidies, tax reliefs, land allocations, and other policy instruments. These incentives must effectively ignite enterprises' enthusiasm and initiative in participating in industry-education integration.

Furthermore, the allocation of educational resources should be optimized. This entails augmenting investments in higher vocational education to elevate educational quality. Measures include fortifying vocational education infrastructure and school operating conditions, bolstering the development of teaching staff to improve teachers' quality and instructional proficiency, and fostering better articulation between vocational and general education. These efforts aim to integrate vocational and general education, offering students a more diversified growth trajectory. Simultaneously, there should be extensive borrowing from international advanced educational concepts and methodologies. By introducing foreign high-quality educational resources, fostering international cooperation and exchanges, and other means, China's vocational education will continuously advance in overall quality. Ultimately, this will provide a steady stream of high-quality technical and skilled talent to sustain industrial development [10].

5.4 Improve the Talent Evaluation System and Expand the Career Development Space for Skilled Personnel

Talent evaluation system is an important lever to guide the direction of higher vocational

education and industrial development. Hubei Province should establish a perfect talent evaluation system to expand the career development space of skilled talents. On the one hand, a diversified evaluation mechanism should be established [11]. Focus on the assessment of students' practical ability and innovation ability, and encourage students to play a greater role in industrial development. This includes the establishment of event platforms such as skills competitions and innovation and entrepreneurship competitions to provide students with opportunities to display their talents and practical abilities; as well as the establishment of a talent evaluation mechanism for school-enterprise co-operation, so that enterprises can participate in the evaluation and selection process of students, and improve the relevance and effectiveness of evaluation. On the other hand, restrictions on skilled talents in terms of settlement, title promotion and job conversion should be broken. Provide broader growth space and development opportunities for skilled talents [12]. This includes formulating more flexible talent policies so that skilled talents can enjoy more autonomy in their career development; as well as strengthening the social security and welfare benefits of skilled talents and improving their social status and recognition. At the same time, efforts to honour and reward skilled talents should be strengthened. The motivation and creativity of skilled personnel should be stimulated through the establishment of activities such as vocational skills competitions and the selection of outstanding skilled personnel. These activities should have a strong appeal and influence and be able to effectively mobilise the enthusiasm and creativity of skilled talents. By improving the talent evaluation system and expanding the career development space for skilled talents, it promotes the benign interaction and common development between higher vocational education and industrial development.

6. Conclusion

By examining the industrial structure of Hubei Province and the academic programs offered by higher vocational colleges and universities, it is found that there exists a certain degree of fit between the two, but there are also many problems. The diversified development of industrial structure in Hubei Province provides

a broad space and opportunity for the professional setting of higher vocational colleges, but there is still a gap between the professional setting and industrial demand in terms of structural matching and the quality of talent cultivation. Through the implementation of precise docking industrial demand, comprehensive optimisation of professional structure; deepening the integration of industry and education, building a new ecology of school-enterprise cooperation; strengthening policy guidance and support, optimising the resource allocation mechanism; perfecting the talent evaluation system, expanding the space for the career development of skilled personnel and other optimisation countermeasures, which can help to improve the coherence between Hubei's higher vocational professional settings and industrial development, and provide robust talent support to fuel the regional economic development.

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Journal Articles

- [1] Lu Zhengqiu. Research on the Coupling and Coordinated Development of Professional Settings in Ningbo Higher Vocational Colleges and Regional Industries. *Technology Wind*, 2023, (25): 164-166.
- [2] Xiang Sunyan. Research on the Coordinated Development of Professional Settings in Local Vocational Colleges and Industries: A Case Study of JM City in Central Hubei Province. *Journal of Jingchu College*, 2020, 21(01): 90-96.
- [3] Meng Xiang, He Yingwen, Zhang Yushu. Analysis of the Coordination Development between Professional Settings of Higher Vocational Electric Power Majors and Industries. *China Electric Power Education*, 2022, (08): 70-72.
- [4] Fu Qiong. Research on the Coordinated Development of Professional Settings in Higher Vocational Colleges and Regional Industrial Demands: A Case Study of

Ningbo. *Journal of Ningbo Polytechnic*, 2021, 25(03): 1-7.

- [5] Zhang Rong. Research on the Coordinated Development of Professional Settings in Higher Vocational Colleges and Regional Industries. *Journal of Taiyuan City Vocational College*, 2021, (05): 205-207.
- [6] Qiu Jinping. Research on the Coordinated Development of Professional Settings in Higher Vocational Colleges and Industrial Demands: A Case Study of Chongqing. *China Management Informationization*, 2020, 23(21): 217-219.
- [7] Lin Shaoyun. Research on the Coordinated Development of Professional Settings in Higher Vocational Colleges and Industries under the Background of Guangdong-Hong Kong-Macao Greater Bay Area Construction. *Journal of Wuxi Commercial Institute of Technology*, 2022, 22(04): 98-105.
- [8] Chen Jichun. Research on the Coupling and Coordinated Development of Professional Settings in Higher Vocational Education and Regional Industries: A Case Study of Guangdong Province. *Exploration of Higher Vocational Education*, 2020, 19(05): 6-12.
- [9] Zhao Shumei, Song Chunhui. Empirical Research on the Coordinated Development of Professional Settings in Higher Vocational Colleges and Industrial Demands: A Case Study of Jilin Province. *Research on Higher Engineering Education*, 2017, (04): 192-197.
- [10] Gu Yali. Research on the Fit Degree between Professional Settings in Higher Vocational Colleges and Regional Industrial Structure: A Case Study of the School of Electronic Information, Zhangzhou Institute of Technology. *The Theory Research and Practice of Innovation and Entrepreneurship*, 2024, 7(23): 78-80.
- [11] Chen Chen, Kong Chenfang. Measurement and Evaluation of the Synergy Degree between Local Universities' Specialties and Regional Industrial Development: A Comparative Study Based on Universities and Higher Vocational Colleges in Wenzhou. *Journal of Wenzhou Vocational and Technical College*, 2024, 24(03): 58-65.
- [12] Li Yanqing, Zhou Zhiping, Guo Chunlei.

Research on the Adaptability of
Professional Settings in Higher Vocational
Colleges to Municipal Industrial

Development: A Case Study of Baoding
City. Hebei Vocational Education, 2024,
8(03): 16-20.