ISSN 2522-6398 Vol. 6, Issue 19: 1-5, DOI: 10.25236/FER.2023.061901

Optimisation of the professional layout of vocational education in the context of Shenzhen's "20+8" industrial layout

Jing Deng[1], Weiheng Chen[*]

[1]Shenzhen Polytechnic University, Shenzhen, Guangdong, 518055, China
**Corresponding author*

Abstract: *In June 2022, Shenzhen issued the Opinions on Developing and Strengthening Strategic Emerging Industry Clusters and Cultivating and Developing Future Industries, proposing that Shenzhen should develop and strengthen 20 strategic emerging industry clusters and cultivate and develop 8 future industries. After the release of Shenzhen's "20+8" industrial layout measures, it is worthwhile for us to think deeply about what industries the professional development of vocational education in Shenzhen should be deployed to. According to the development of modern vocational education should be compatible with the local socio-economic development ideas and principles of schooling. Shenzhen vocational education should actively adapt to the transformation and upgrading of the local economy, cultivate new momentum of economic development, take the initiative to implement the professional layout and optimise the professional structure, in order to promote the development of industry to train professionals.*

Keywords: *Shenzhen "20+8" industrial layout; vocational education; professional layout*

1. Introduction

In 2022, Shenzhen issued the Opinions on Developing and Strengthening Strategic Emerging Industry Clusters and Cultivating the Development of Future Industries, proposing that "by 2025, the added value of Shenzhen's strategic emerging industries will exceed 1.5 trillion yuan, becoming the main engine for promoting high-quality economic and social development."[1] The introduction of a series of heavyweight industrial development initiatives has strengthened the confidence and determination of the industrial sector. It triggered a strong reaction in the field of strategic emerging industries in Shenzhen. In the context of the new development pattern of the double cycle, the strategic emerging industry field in Shenzhen will stabilise the basic disc of the manufacturing industry through the construction of industrial clusters, drum up the backbone of development, and enhance the competitiveness of the modern industrial system and the competitiveness of regional industries. In the new development stage of Shenzhen, the development of vocational education should deeply fit the industrial layout of Shenzhen, relying on the local industrial planning, training to adapt to the development of local industries, providing talents for the reform and development of Shenzhen's industrial economy, and cultivating talents with the ability to adapt to the development of Shenzhen's industries. This paper takes this as the background to sort out and explore the implementation path of optimising the professional layout of vocational education.

2. Overview of Shenzhen's "20+8" industrial layout

2.1 Building a National Highland for Innovation and Development of Digital Creative Industries

In recent years, Shenzhen's digital creative industry has been developing rapidly relying on the advantages of developed digital technology and the convergence of cultural and creative resources, with a growth rate significantly higher than the city's GDP growth rate over the same period, and the industry is leading in terms of scale and development level in the country, cultivating a number of digital creative leaders such as Tencent and Huaqiangfangte, etc., and gaining strong momentum in integrated development, with new types of enterprises, new types of industries, new types of modes and new types of consumption emerging continuously, and the export trade of digital creative products and services being active. The export trade of digital creative products and services is active, and the export

ISSN 2522-6398 Vol. 6, Issue 19: 1-5, DOI: 10.25236/FER.2023.061901

of games, animation, digital creative equipment and other fields account for a large share of the country, forming a more complete industrial chain covering creation and production, dissemination and operation, consumer services, and manufacturing of derivatives.

2.2 Promoting Shenzhen's fashion industry towards the front end of the global value chain

Shenzhen will accelerate the pace of digitisation by relying on the existing foundation of fashion industry construction. Guide fashion industry enterprises to focus on technology, management, production, products, operation and maintenance, and improve the digital level of demand analysis, research and development design, production control, equipment operation and maintenance, safety control, remote service and other key scenes. Especially in the apparel, furniture, gold jewellery, leather and other industries, cultivate a number of intelligent manufacturing demonstration factories with full life-cycle quality control, agile demand sensing and production, sales and use synergy, and make every effort to improve the level of modern management, resource allocation and operational efficiency. At the same time, to support the fashion industry enterprises to establish R & D institutions as the core carrier of technological innovation system, encourage the application of high-tech enterprises, the construction of key laboratories, engineering centres, enterprise technology centres, industrial design centres and other innovation carriers. Enterprises are encouraged to carry out basic theoretical research and technological innovation with universities and research institutes, and make breakthroughs in key technologies and core components and parts that constrain the high-quality development of the industry.

2.3 The added value of the drone industry will reach tens of billions of dollars.

With the development of the manufacturing industry towards digitalisation, networking and intelligence, as well as the demand for "machine replacement" brought about by the new crown epidemic, the demand for industrial robots has grown significantly. The Action Plan for Cultivating and Developing Intelligent Robot Industry Clusters in Shenzhen (2022-2025) reveals that by 2025, the added value of Shenzhen's intelligent robotics industry will reach 16 billion yuan, of which the added value of the drone industry will reach a scale of tens of billions of dollars, and rapid growth will be achieved in industrial robots, service robots, and special robots.

2.4 Internationally leading product technology in some areas

The Action Plan for Cultivating and Developing Safety, Energy-saving and Environmental Protection Industry Clusters in Shenzhen (2022-2025) proposes that by 2025, the added value of Shenzhen's safety, energy-saving and environmental protection industry will exceed 60 billion yuan, a number of backbone enterprises and famous brands with domestic and international competitive advantages will be cultivated, and three or more enterprises with annual output value exceeding tens of billions of yuan will be cultivated, 20 or more enterprises with annual output value exceeding one billion yuan will be cultivated, and 100 or more specialised enterprises will be cultivated. More than 100 enterprises. Shenzhen will also plan and build more than two industrial clusters, forming an industrial agglomeration belt with technology research and development, headquarters base as the core and equipment manufacturing and comprehensive utilisation of resources as the characteristics, and accelerating industrial agglomeration.

2.5 10 new manufacturing "individual champions" will be added.

The Action Plan for Cultivating and Developing Laser and Additive Manufacturing Industry Clusters in Shenzhen (2022-2025) proposes that by 2025, the added value of the industry will reach 14 billion yuan, and there will be 10 new manufacturing industry "single champions", specialised and specialised "small giants" and "unicorn" enterprises. Substantial breakthroughs have been made in key areas such as basic materials, core components, support software, high-end devices, etc., with the addition of one provincial-level or above manufacturing innovation centre, 10 enterprise technology centres, and a steady improvement in innovation capacity.

2.6 Intelligent networked vehicle industry revenue to reach 200 billion yuan

By 2025, the revenue of Shenzhen's intelligent networked automobile industry will reach RMB 200 billion, forming a strategic echelon of more than 10 enterprises with revenue of more than 10 billion

ISSN 2522-6398 Vol. 6, Issue 19: 1-5, DOI: 10.25236/FER.2023.061901

and more than 20 enterprises with revenue of more than 1 billion, cultivating and introducing a batch of enterprises with international competitiveness, significantly improving the level of industrial agglomeration and development, and completing the establishment of a globally influential highland of innovation and application of intelligent networked automobiles. Promote the head enterprises to improve the integration capability of intelligent, connected and electrified vehicles, and cultivate a number of outstanding enterprises in important links such as automotive wireless communications, intelligent sensing systems, on-board computing platforms, cloud service terminals, power batteries, electric motors and electric controls, charging facilities, etc., so as to form a development pattern of "1 head enterprise + N leading components and parts enterprises". Accelerate the deployment of intelligent roadside facilities integrating sensing, communication and edge computing capabilities, improve charging and hydrogen refuelling facilities, strive for the creation of a national-level Telematics Pilot Zone, build a leading demonstration zone for the application of intelligent Internet-connected vehicles in China, and build a functional, reasonably laid-out, stably operated, intelligent and safe infrastructure network.

2.7 Establishment of a globally renowned innovative drug research and development centre

By 2025, the added value of the biomedical industry will reach 40 billion yuan, the business revenue will reach 100 billion yuan, a number of specialised biomedical industrial parks with distinctive features and synergistic development will be built, and the level of industrial agglomeration and development will be significantly enhanced. In terms of industrial structure, 8-10 enterprises with world influence will be introduced to set up headquarters, R&D centres and high value-added production bases in Shenzhen, and the number of biomedical domestic and overseas listed enterprises will reach 40, with revenues exceeding 10 billion yuan, 15 billion yuan and 25 billion yuan. The R&D investment intensity of enterprises above the scale has reached 10%, 200 innovation carriers at all levels and 5 major science and technology infrastructures have been built, major platforms for model experimental animal research, pharmaceutical CRO/CDMO/CMO, biologics inspection and testing, and internationalisation of traditional Chinese medicines and natural products have been established, and 15 domestic Class I new drugs have obtained marketing approvals, and 400 medicines have entered into the stage of clinical trials.

2.8 Creating a spatial layout of "one centre and many nuclei"

The Action Plan for Cultivating and Developing Software and Information Service Industry Clusters in Shenzhen (2022-2025) proposes that by 2025, Shenzhen will accelerate the development of software and information service industry clusters and create ten key projects to accelerate the construction of a strong manufacturing city and promote the industry to the high end of the global value chain. At present, Shenzhen software and information service industry in recent years, the industry scale ranks the forefront of large and medium-sized cities in the country, 2021 annual software and information service industry added value of 229.50 billion yuan, an increase of 13.7% year-on-year, accounting for the proportion of the city's GDP is 7.5%, the rapid growth of industry clusters, showing strong vitality.

3. Clarifying the source of impetus for optimising the professional layout of vocational education in Shenzhen

The development of vocational education should "deepen the integration of industry and education, school-enterprise co-operation", the integration of industry and education is a macro-level perspective, that is, industry and education; school-enterprise co-operation is a relatively micro-level perspective, that is, schools and enterprises.[2]

3.1 The external impetus for promoting the professional layout of vocational education in Shenzhen is the classification of policies according to local conditions

Based on regional resource endowment, Shenzhen gives full play to the characteristic advantages of each district, coordinates and optimises the spatial layout of strategic emerging industries, and creates and builds industrial clusters in a more detailed and precise manner. The government coordinates the planning, fully mobilises the initiative and creativity of market players, builds an ecological platform for the collaborative innovation and development of strategic emerging industries, and strives to

ISSN 2522-6398 Vol. 6, Issue 19: 1-5, DOI: 10.25236/FER.2023.061901

promote the in-depth integration of industrial chain and innovation chain, and realise the security and control of industrial chain and supply chain. Shenzhen has already built up a "basic research + technology research + industrialisation + science and technology finance + talent support" whole process of innovation ecological chain. In the high-end equipment industry, focusing on four strategic emerging industry clusters, including industrial mother machines, intelligent robots, laser and additive manufacturing, and precision instruments and equipment, is conducive to further enhancing the core competitiveness of the industry and promoting the overall development of the economy and society. Optimising the professional layout based on the status quo and demand of local socio-economic development is an important impetus to promote the upgrading and development of vocational education.

3.2 Strengthening spatial security is the intrinsic motivation for promoting the optimisation of the professional layout of vocational education in Shenzhen

According to the guidance of Shenzhen's "20+8" industrial layout, Shenzhen-Shantou will actively play the role of Shenzhen's mega-industry centralised carrier, and build an international first-class eastern industrial new city. Efforts to build a "one body, two wings" industrial pattern, high-quality construction of the west wing of the Shenzhen-Shantou Smart City, and actively build the northern Advanced Manufacturing Park, Central Ecological Environment Park, the southern port Industrial Park, three strategic emerging industries, focusing on the development of intelligent network cars, energy-saving and environmental protection, new energy, new materials, and marine and other industrial clusters; high level development The east wing of the Shenzhen-Shantou Bay Robotics Cluster, focusing on the development of robotics, artificial intelligence industry, to create a robotics industry chain characteristics of the cluster. The development direction of Shenzhen's vocational education should become the "server" of Shenzhen's industrial construction, the "catalyst" of industrial upgrading and transformation, and the "accelerator" of industrial reform and development, in order to build a comprehensive and integrated development pattern of education and industry.[3] To create conditions for building a co-ordinated and integrated development pattern of education and industry.

4. Exploring the Path of Optimising the Professional Layout of Vocational Education in Shenzhen

Shenzhen plans to create a "professional talent cultivation project", will implement the "software discipline professional strong chain to fill the chain plan", to support the city's institutions of higher learning to set up and strengthen the big data, cloud computing, artificial intelligence, blockchain and other emerging technologies, encourage and support the initiative of colleges and universities to integrate into the construction of industrial parks, science and technology parks, and jointly with leading enterprises to build a fusion of education and industry-type enterprises.

4.1 Optimising the layout of specialisations in line with the regional economy and innovating the talent training model

Improve the dynamic adjustment mechanism of green, yellow and red card professions, closely match the trend of industrial upgrading and technological change, and optimise the layout of professions around the advanced manufacturing industry and modern service industry; strengthen the integration of multiple professions and multi-technology integration in the context of the digital economy, and set up and upgrade the professional clusters in line with the Shenzhen "20+8" industrial clusters; deepen the integration of industry and education, and school-enterprise co-operation, and improve the development of the featured industrial colleges and explore the construction of the field engineer talent cultivation mode with the characteristics of "technological traction, product carrier, rationale-realistic integration, and competence-based".

4.2 Developing new curricula in line with the "four new" economies and expanding the sharing of quality teaching resources

Based on Shenzhen high-end industries and industrial high-end, joint head enterprises to build a "new curriculum development centre", in a timely manner, new methods, new technologies, new processes, new standards into the education and teaching, and jointly develop a new industry, new occupations, new professions, new courses four-in-one standard system, to lead the professional changes, leading the construction of the new curriculum, the formation of industry, technological

ISSN 2522-6398 Vol. 6, Issue 19: 1-5, DOI: 10.25236/FER.2023.061901

change and teaching reform in the same frequency resonance of the benign mechanism.

4.3 In-depth promotion of talent school strategy, to create a high level of master craftsmen and masters led by the "dual-teacher" faculty.

Implement the "master technician", "master craftsman", "management talent" attraction and training programme, set up the "chair professor" position, and gather talents by all means; build a long-term mechanism for the construction of teachers' morality and ethical conduct, build a good national vocational education "dual-teacher" teacher training and cultivation bases, and promote in-service teachers' "double enhancement of academic qualifications and competence", and cultivate a batch of "Mr. Big", who is good in morality and skills.[4]

4.4 Building a high-level social service system

Construction of the "Vocational Education Teacher Competence Training Centre", to create a base for vocational education teacher training; construction of the "New Technology and New Skills Training Centre", the university-enterprise joint high-level technology research and development transformation and training services, to provide advanced technology and skills training for employees and new recruits; construction of the "Community Learning Centre", to meet the diversified and personalized learning needs of the public, and to help build a high level of Shenzhen's learning-oriented city and skill-based society.

4.5 Accelerating the digital transformation of schools and striving to build world-class vocational schools with Chinese characteristics

Adapting to the new trend of intelligent education, promoting the reform of education, teaching and evaluation methods, and improving the vitality of the classroom and the effectiveness of teaching; comprehensively consolidating the digital base of the school, building an immersive and intelligent practical training system, and enhancing the students' ability to practise digital engineering; and constructing the UNESCO chair project on "Digitalisation of Vocational and Technical Education", and leading the digital transformation of global vocational education.

References

[1] Zhang Suyuan, Gu Jiang. How temporary industrial clusters promote urban innovation [J]. Financial Science, 2023(02):138-148.
[2] Ye Deqiang, Jiang Jin, Liu Peng, et al. Cultivating speciality, speciality and new "small giant" enterprises by new type of industrial incubator [J]. Gansu Science and Technology, 2022:38-40.
[3] Liu Xujun. Opportunities, Challenges and Response Strategies for High-Quality Development of Vocational Education in the New Era [J]. Education and Vocational, 2022:43-48.
[4] Hu Wanshan, Ye Lin. Historical Evolution, Practical Basis and Development Trend of Industry-Teaching Integration in Higher Vocational Education [J]. Modern Education Management, 202282-89.