

RESEARCH ARTICLE

Qingdao Regional Economic Development of High Quality of Port and Shipping Logistics Talent Science and Education Integration Training Mode

Ye Mei^{1,2}

1. Qingdao Harbour Vocational & Technical College, Qingdao 266404, Shandong, China

2 College of Education, Trinity University of Asia, Manila 1102, Philippines

Abstract: Starting from the adaptive context of the port and shipping logistics professional training of higher vocational education to the port and shipping industry, we study experts at home and abroad. The relevant results, combined with the empirical research of the subject, proved the laws and characteristics of the development of the port and shipping logistics industry under the new quality productivity, corresponding to the higher vocational port and shipping logistics. The new requirements of talent training supply, further investigate the Marine development of shipping trade and the corresponding demand changes of talent training supply, analysis Ming new quality productivity enables the connotation mechanism of digital education of higher vocational education, analyzes its internal constraint factors, and concludes it through practical empirical research. The training model of high-quality economic development of port and aviation logistics talents promotes the quality of Qingdao port and aviation talent training. Rising, to provide a reference for the government's decision-making.

Keywords: Vocational education; Port and shipping logistics; Integration of science, education, and industry; Training models

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1 Introduction

General Secretary Xi Jinping has pointed out that the new quality productive forces are the new relations of production, the quality of advanced productive forces and the focus of development. On May 23, 2024, the General Secretary visited Rizhao Port in Shandong province and proposed to give full play to the Marine advantages to build port groups to promote the development of new quality productivity enabling ports. On May 30, the vice governor of Shandong province inspected the port vocational education and proposed to build a paradigm to cultivate talents. New

industries, new models, and new growth drivers are the core elements of new-quality productive forces. Vocational education should make a "response to The Times" for national construction, promoting modernization and national rejuvenation^[1].

With the development of globalization and information technology, the logistics industry has become the key to promote the regional economic development. Qingdao is an important economic engine of the Yellow River basin, with multiple functions such as free trade zone and rich Marine resources. In order to build a maritime power,

Qingdao needs a large number of innovative and technical talents to explore its maritime advantages. Qingdao port and shipping logistics industry is developing rapidly, but high-quality and professional logistics talents are in short supply^[2]. Therefore, it is of great significance to improve the integration and training mode of Qingdao port and waterway logistics talents and promote the high-quality development of regional economy, and help to connect the industrial chain and meet the needs of the transformation and upgrading of the logistics industry.

2 Explain the shortage of high-quality port and shipping logistics talents in Qingdao

2.1 Explanation of academic theory

Research on the driving factors of digital economy development. Digital economy takes digital knowledge and information as the key elements, and digital technology as the driving force. Through the deep integration of information network, the level of digitalization, networking and intelligence is improved, and the mode of economic development and governance is reconstructed. Enterprises are the main objects, and their development drivers include technology, data, policy, demand and talent. Zhou Wenhui, Lin Yifu, Chen Jian and other scholars analyzed the challenges and opportunities of digitalization to enterprise operation, and put forward the digital empowerment method. For China and other developing countries, the global value chain is not only reflected in the expansion of trade volume, but also brings about changes in the economic structure, facing challenges such as economic dependence and unbalanced talent structure^[3].

Research on the relationship between new quality productivity and higher vocational education. New quality productivity reflects the characteristics of scientific and technological innovation leading and high efficiency and high quality. Cao Yong and others advocate promoting digital innovation and cross-border integration to enhance the adaptability of talent cultivation^[4]. Digital economy requires education to unify talent training and efficiency, and adapt

to career promotion. The digital education of vocational education needs to construct the digital classroom first, but there are limitations. The new quality productivity changes the environment of higher vocational education, and the way of education is needed to echo it. Zeng Tianshan and others believe that it is necessary to adjust the education method to adapt to the development of new quality productive forces.

Research on the mechanism of digital intellectual education in higher vocational Education. Zhuang Xizhong and Xu Guoqing advocated promoting digital technology to reconstruct the mechanism of vocational education and education through innovation, which is the key to improve the quality of talent cultivation and the governance ability of vocational education. Thus, han-zhong wang, xiao-hua deng proposed focus on teaching integration, teaching and learning and internal and external governance three core digital reconstruction, reshape teaching integration, optimize resource supply, innovation teaching mode and promote governance transformation, think to government thrust, market pull, technology driving force of higher vocational education digital education transformation of triple force, put forward the path of transformation method.revitalize the stock resources, build industrial alliances, and build the guarantee mechanism of digital education of "home-school and enterprise administration"^[5].

The above research has room for further expansion. As long as the relationship between digital economy and higher vocational education is not deep enough, there is especially a lack of mining of the relationship between the supply and demand of higher vocational education talents in the digital transformation of enterprises. The economic fundamentals of China's shipping trade have changed, facing problems such as economic dependence and unbalanced talent structure. The domestic and foreign economic environment is weak, the new quality productivity promotes the construction of digital economy, and the port and shipping logistics talents need to adapt to the new requirements. Traditional relations of production restrict the high-quality growth of trade economy. It is necessary to adjust the relations of production,

reorganize the factors of production, break the impasse of economic development with new quality productive forces as the core, and promote the high-quality growth of Marine trade economy.

2.2 Insufficient supply of high-quality port and shipping logistics talents cultivation in Qingdao

First, the advantages of new quality productivity in driving the high-quality development of Qingdao's Marine trade and economy are not outstanding enough. Driven by new quality productive forces, Qingdao Marine trade economy is not outstanding enough. Although Qingdao has multiple benefits such as free trade zone, the inadaptation of production relations restricts the development of digital economy in the promotion of new quality productivity. In addition, the innovation leading role of new quality productivity is not strong, and the industrial cluster lacks global competitiveness^[6]. At the same time, the industrial coordination function is limited, and the development force of the innovation and optimization of production factors is not good. Collaborative evolution and quality traction function are also insufficient. Qingdao needs to strengthen scientific and technological innovation, improve the quality of products and services, and build a good innovation ecology and quality infrastructure to achieve high-quality economic development^[7].

Second, under the strategy of meridian ocean, the "Qingdao advantage" of vocational education talent training is not outstanding enough. As an important coastal city in China, Qingdao enjoys unique geographical advantages and economic development potential. Qingdao is committed to building a new highland for the development of Marine economy. However, in this process, the "Qingdao advantage" of vocational education talent training has not been fully played. Although Qingdao has good educational resources and industrial foundation, the deep integration of vocational education and Marine problem industry is not enough, which leads to the mismatch between supply and demand of talents, especially the shortage of highly skilled and innovative Marine economy talents, which restricts the

further development of Qingdao's Marine economy to a certain extent^[8].

Vocational education is an important way to train professional and skilled talents, and it is very important to support the implementation of Marine strategy. However, at present, there are some problems in the training of vocational education talents in Qingdao, such as the disconnection between the curriculum and the needs of the Marine industry, the lack of practical teaching resources, and the low participation of enterprises^[9]. These problems lead to the gap between the actual working ability of vocational education graduates and the needs of enterprises, and it is difficult to meet the needs of high-quality Marine economic talents in the Economic Strategy.

3 Analysis of the current situation of Qingdao port and shipping logistics and the interpretation of the connotation of high-quality port and shipping personnel in the new era

3.1 Analysis of Qingdao status

Qingdao port and navigation logistics location advantage is obvious. Qingdao, the world ocean city and port city, is also the largest port transportation and logistics in northern China. Qingdao gathers the most advantageous Marine resources in the world and China, with superior geographical location, perfect port facilities and advanced logistics technology. The logistics business of Shandong Port Qingdao Port covers shipping, land transport, air transport, customs declaration and inspection, warehousing and distribution and other fields, to provide customers with a full range of logistics services. In recent years, the logistics industry of Qingdao Port has been developing rapidly, not only the business volume is growing, but also the service quality is constantly improving. The port and navigation logistics in Qingdao plays an important role in supporting and leading the high-quality development of Shandong Peninsula, the Yellow River basin and China's economy.

Qingdao port and navigation logistics talent demand current situation structure contradiction. With the rapid

development of Qingdao port and shipping logistics industry, the demand for logistics talents is also increasing. At present, the logistics talents in Qingdao Port are mainly concentrated in the traditional logistics fields, such as transportation, warehousing, etc., while there are relatively few talents in the high-end fields such as supply chain management and logistics planning. In addition, Qingdao Port logistics enterprises have diversified demands for talents, which not only need to have professional logistics knowledge, but also need to master the knowledge of emerging fields such as modern information technology and cross-border e-commerce^[10].

Current situation and challenges of Qingdao port and navigation logistics talent training. At present, the main way of Qingdao port and waterway logistics talent training is higher education and vocational education. However, compared with the actual demand, there is a certain gap in the quantity and quality of talent training. The traditional talent training mode pays attention to the teaching of theoretical knowledge, while the cultivation of practical ability is relatively insufficient, which makes it difficult for graduates to adapt to the needs of enterprises in practical work. In addition, with the continuous emergence of emerging technologies and the transformation and upgrading of the logistics industry, the requirements for logistics talents are also constantly improving, requiring talents to have qualities such as innovation ability, cross-border thinking and international vision.

3.2 Connotation interpretation of port and shipping logistics talents for the high-quality development of Qingdao regional economy

New quality productivity enables the digital operation and upgrade of ports in the new era, which requires the corresponding port and shipping logistics talents to have rich connotation. This is to cultivate and supply based on Qingdao, digital intelligence skills logistics talents, serving Shandong and facing the world.

Develop the geographical advantages. Qingdao is located in the eastern coast of China, which is an important

node of "Belt and Road". Its port and shipping logistics talents should have an international vision, be familiar with international rules, actively participate in international competition and cooperation, and provide a strong talent guarantee for the development of Qingdao port and shipping industry.

Deep cultivation of port and shipping advantages. Port and shipping logistics talents need to have solid professional knowledge and practical experience, and can make full use of the geographical advantages and resource advantages of Qingdao Port to promote the efficient development of port and shipping logistics industry. At the same time, these talents also need to have a keen market insight, to be able to find and grasp the market opportunities in time, and to inject new vitality into the sustainable development of Qingdao port and navigation industry^[11].

Excellent skill level. With international vision and superb operation skills and coordination ability, can master modern port logistics equipment and technology, to ensure the efficiency, safety and stability of port logistics operations. At the same time, they also need to have good communication skills and teamwork skills, and be able to maintain close cooperation with all parties to jointly promote the development of the port and shipping logistics industry.

Innovation and collaborative empowerment. Qingdao port and shipping logistics talents need to have innovative thinking and innovative ability, and can continue to explore and try new port and shipping logistics mode and technology, and promote the innovation and upgrading of port and shipping logistics industry. To enhance their own competitiveness, to provide a strong support for the high-quality development of Qingdao regional economy.

4 Logistics talent training mode at home and abroad

4.1 Foreign logistics talent training mode for reference

The United States "practice-type" logistics talent training mode. Pay more attention to practical teaching,

emphasizing that students can gain practical experience in enterprise practice. Improve students' practical operation ability through case analysis and project practice. This model enables students to learn in a real working environment and better adapt to the needs of the enterprise.

Germany's "dual system" logistics talent training mode. That is, school education and enterprise practice are closely combined. While students receive theoretical education in school, they also receive practical training in enterprises to realize the organic combination of theory and practice. The students cultivated by this model have both a solid theoretical foundation and rich practical experience.

Japan's "refined" logistics talent training mode. Pay attention to cultivating students' detail consciousness and fine operation ability. Through strict practice teaching and fine management, improve students' logistics operation level and service quality. This model cultivates students with a high sense of responsibility and professionalism, and can provide high-quality logistics services for enterprises.

4.2 Logistics talent training mode of other domestic ports

Shanghai Port "integration of industry and education" logistics talent training mode. Through cooperation with universities and vocational colleges, Shanghai Port jointly formulates talent training programs and teaching plans to realize the close combination of teaching and industrial needs. Students cultivated by this model have both theoretical knowledge and practical skills, which can better adapt to the needs of enterprises.

Ningbo Port "international" logistics talent training mode. Ningbo Port actively introduces international advanced logistics concepts and teaching methods, strengthens the cooperation with international well-known enterprises and institutions, and improves students' international vision and cross-cultural exchange ability. The students cultivated by this model have an international vision and a way of thinking, and can better adapt to the global logistics industry.

These modes provide a useful reference for Qingdao port and navigation logistics talent training. To implement the Shandong chapter of Chinese-style modernization proposed by the General Secretary, Make Qingdao contributions, It is necessary to focus on the structural contradiction of port and shipping logistics talents in the development of Qingdao shipping economy, Taking the cultivation of the science and education integration and training mode of port and shipping logistics talents based on the high-quality development of Qingdao regional economy as the starting point, Focus on, and deeply explore, the advantages of Shandong's Marine economy^[12]. Basic characteristics of the shipping trade in Qingdao, Mining the basic laws of its development process, Analyze the current situation and shortage of Qingdao port and navigation logistics talent cultivation, Put forward with Qingdao characteristics, Shandong style, Chinese fashion and the world pattern of science and education integration of high-quality technical skills and practical port and shipping logistics talent cultivation path, And conducted an empirical study, Summarize the general rules and feasible measures, For learning from similar colleges and universities, To provide reference for government decision-making.

5 Build a science-education integration and training mode of port and shipping logistics talents for the high-quality development of Qingdao regional economy

Port and navigation logistics education is an important link and a key step for cultivating practical talents for national trade exchange and logistics service. The territory of the construction of talent training mode of science and innovation integration is very broad. As shown in Figure 1.

The "Taylor principle" proposed by Taylor includes four aspects: goal, content, method and evaluation, which give us many important enlightenment in the curriculum education. The talent training mode of high-quality Qingdao regional economic development should be considered from the following aspects.

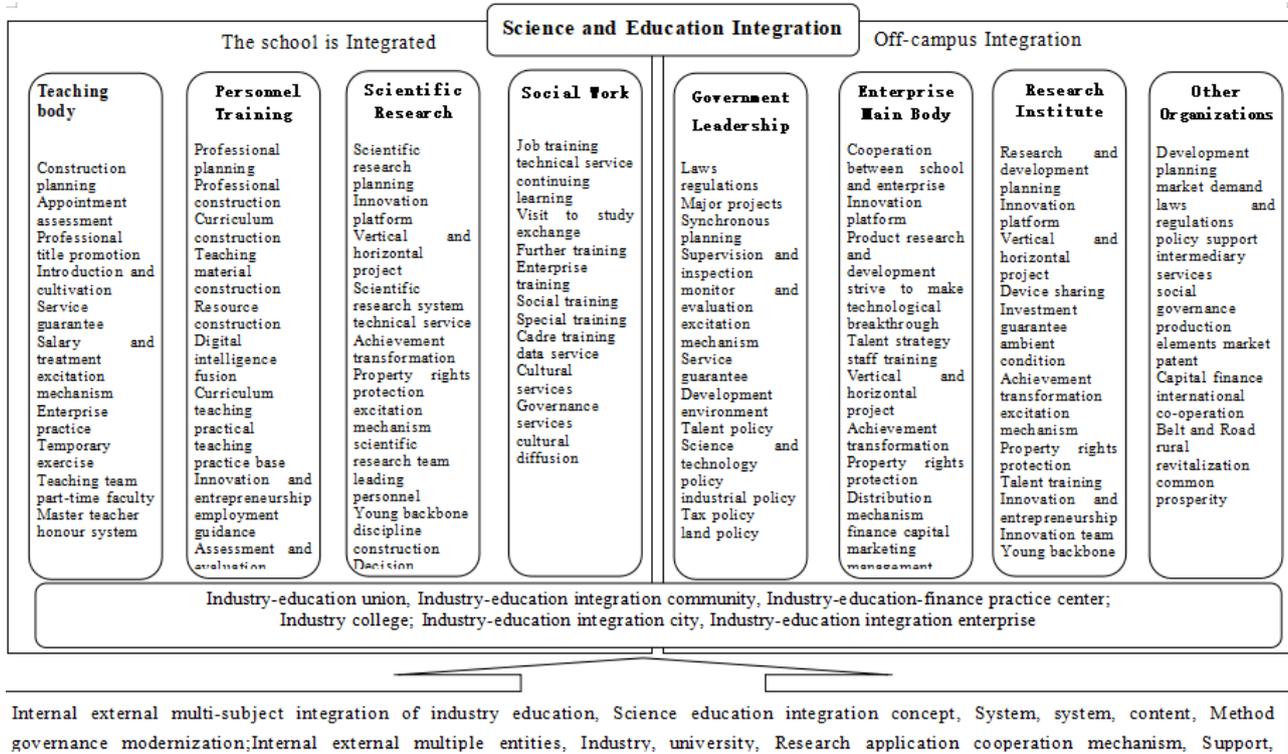


Figure 1 Model of the internal mechanism of science and education of talents of port and shipping logistics

5.1 Mode construction

Culture target positioning. The construction of the talent training mode of Qingdao port and navigation logistics should aim at cultivating high-quality applied talents who master the basic theories, knowledge and skills of modern logistics. Specific training objectives include: logistics planning, logistics operation, logistics management ability; innovative spirit, practical ability and international vision; good professional ethics and professional quality, competent for logistics enterprises, ports, customs and other fields.

Curriculum system setting-up. The curriculum system of Qingdao port and navigation logistics talent training mode should take the basic theory of logistics, logistics management, logistics technology and equipment, and logistics system planning and design as the core courses. At the same time, industry standards and vocational qualification certification courses should be introduced to enable students to master industry norms and improve their employment competitiveness. In addition, practical teaching should be strengthened, and practical training, curriculum design and graduation design should be set up to improve

students' practical ability and innovation ability.

Construction of the teaching staff. The construction of teachers in Qingdao port and navigation logistics talent training mode should strengthen teacher training, encourage teachers to participate in academic conferences, enterprise practice and other activities, and improve teachers' professional quality and practical ability. At the same time, logistics professionals with rich practical experience and academic background should be introduced to optimize the structure of the teaching staff. In addition, an incentive mechanism should be established to encourage teachers to carry out scientific research and teaching reform, and to improve the teaching level and the quality of talent training.

5.2 Culture strategy

School-enterprise cooperation, to build a practice base. Build a platform to strengthen the cooperation with well-known logistics enterprises at home and abroad, and jointly build a logistics practice base. By providing students with internship and practical training opportunities, an in-depth understanding of the logistics industry operation process. At the same time, enterprises can participate in the curriculum

design, integrate the industry cutting-edge technology and ideas into the teaching content, and realize the close combination of talent training and industrial needs.

Integration of production and education, improve the quality of training. In combined with the needs of Qingdao port logistics industry, adjust the professional curriculum. By introducing industry cases and implementing case teaching, students' ability to analyze and solve problems is enhanced. At the same time, enterprise experts can be hired as part-time teachers to strengthen the construction of teachers. In addition, an innovation and entrepreneurship fund can also be set up to support students to carry out innovative projects in the logistics field and stimulate students' innovative awareness and entrepreneurship^[13].

International communication, to broaden the students' horizons. Relying on the vocational education alliance and the Marine cooperation platform, we will strengthen the cooperation and exchanges with internationally renowned ports and logistics enterprises. Expand their international horizons by encouraging students to participate in international logistics conferences and academic activities. At the same time, international advanced logistics courses and teaching resources can be introduced to improve the level of teaching internationalization. In addition, a working mechanism linking maritime business litigation and arbitration can be established to cultivate a service team of lawyers, and improve students' legal literacy and cross-cultural exchange ability.

5.3 Four classroom linkage: build an all-round system of port and waterway talent training

Class 1: strengthen professional teaching and theoretical literacy. The first class is the main position of port and navigation professional personnel training. In professional teaching, we should pay attention to the combination of theory and practice, and stimulate students' learning interest and initiative through case teaching, project teaching and other methods. At the same time, ideological and political education and professional ethics education should be strengthened to cultivate students' sense of social

responsibility and professional quality. In addition, attention should be paid to cultivating students' international vision and cross-cultural communication skills, so as to lay a solid foundation for their future career development.

The second class: expand the comprehensive quality and innovation ability. The second class is an important supplement to the training of port and navigation professionals. Through the organization of various academic competitions, scientific and technological activities, social practice and other activities, to expand students' comprehensive quality and innovation ability. For example, we can hold academic lectures, seminars and forums in the field of port and navigation, and invite well-known experts and entrepreneurs to impart cutting-edge knowledge and practical experience to students; Meanwhile, students can be organized to conduct technological innovation and entrepreneurial practice activities to cultivate their innovative consciousness and entrepreneurial ability.

The third class: strengthen the practice and practical training and vocational skills training. The third class is the key link of the port and navigation professional talent training. Through cooperation with enterprises to build training bases and laboratories, to provide students with practical training opportunities. In practice, attention should be paid to cultivate students' professional skills and practical ability, and meanwhile, to educate and guide the students' professional quality and professional ethics. In addition, students can also be encouraged to participate in scientific research projects and practical activities of enterprises to improve their comprehensive quality and innovation ability.

Class 4: Pay attention to innovation, entrepreneurship and career planning. The fourth class is the extension and expansion of the training of port and navigation professional talents. By strengthening innovation and entrepreneurship education and career planning guidance, students can help to better adapt to the needs of future career development. In innovation and entrepreneurship education, attention should be paid to cultivating students' innovative thinking and entrepreneurial ability, and also providing students with

entrepreneurial resources and support services. In terms of career planning guidance, we should provide personalized advice and guidance for career planning according to their character, interests and abilities, and cooperate with enterprises to provide students with more employment opportunities and career development paths.

5.4 Effect evaluation and improvement

Construction of the effect evaluation index system. Big data should be used to build evaluation indicators and system. The evaluation index system should include employment rate, salary level, employer satisfaction and graduate satisfaction^[14]. It evaluates the effect of talent training by measuring the market adaptability of graduates in the logistics industry, reflecting the career development level and market competitiveness in the logistics industry, and reflecting the comprehensive quality and professional skills of the graduates' satisfaction with the school education and teaching and the career development prospect.

Data collection and analysis methods. The data collection and analysis methods for the evaluation of Qingdao port and navigation logistics talents should include questionnaire survey, interview survey and data statistics and analysis. Design questionnaires and data on employment, salary and satisfaction were designed for graduates and employers. At the same time, in-depth interviews can be conducted with some graduates and employers for more detailed information and feedback. The statistical analysis method is used to process and analyze the data, extract useful information, and provide scientific basis for improving talent training.

Comprehensive evaluation and improvement suggestions of the cultivation effect. According to the results of the evaluation of the talent training effect, the training effect can be comprehensively evaluated. If the employment rate and salary level are high, it means that the talent training quality is high and recognized by the market; if the employers are more satisfied, it indicates that the comprehensive quality and professional skills of the graduates meet the market demand; if the graduates are

more satisfied, it reflects that the teaching level and training quality of the school is recognized by the students. In view of the problems and deficiencies in the evaluation results, the corresponding improvement suggestions are put forward to strengthen the practical teaching link, improve the students' practical operation ability, and strengthen the professional quality and professional ethics education.

6 Conclusion

Through the analysis of the current situation of Qingdao port and navigation logistics, the reference of domestic and foreign logistics talent training mode and the construction of Qingdao port and navigation logistics talent training mode, the implementation strategy and effect evaluation method of the scientific and educational integration training mode of Qingdao port and navigation logistics talents are put forward. First, to build an "industry-university-research" cooperative education platform, Closely linking universities, enterprises and industry associations, Realize the seamless connection between talent training and social needs; Second, the implementation of the "double-qualified" teacher team construction, Vigorously cultivate the "double-qualified" teachers who understand both theory and practice, Improve teachers' professional skills and professional quality; Third, to promote the "three-stage" talent training mode, Namis, undergraduate, master and doctoral education, Form a complete talent training system; Fourth, pay attention to the cultivation of students' practical ability and innovation ability, Through practical teaching, scientific research projects, discipline competitions and other ways, Comprehensively enhance the comprehensive quality of students and employment competitiveness.

With the depth of the new productivity and kinetic energy release, as an important part of the world trade logistics, Qingdao port logistics talent local characteristics and international advantages will continue to strengthen, summed up is to introduce international advanced logistics concept and teaching methods, improve teaching internationalization level, the science and personnel training process, always and comprehensive, improve students'

comprehensive quality, employment competitiveness and career development, era development, for the port and shipping logistics industry development of Qingdao and the country more wisdom and strength.

References

- [1] Myles Horton. Digital Learning Design[d]. Educational Science Press, 2019: 36-48.
- [2] Samuel Muehleemann. Making Apprenticeships Profitable for Firms and Apprentices: The Swiss Model[J]. Challenge, 2021, 59(5): 390-404.
- [3] Cao Yong. Digital innovation capability, cross-border search, and new product development performance: the regulatory effect of policy perception capability [J]. China Science and Technology Forum, 2023 (10): 41-49.
- [4] Chen Xiaohong, Li Yang Yang. Theoretical System and Research Prospect of Digital Economy [J]. Management World, 2022, 38 (02): 208-224 + 13-16.
- [5] Liu Yuanjie, Xiong Qingcheng. New quality productive forces drive educational reform in the new era: Logic, direction and response [J]. Distance Education in China, 2024, 44 (05): 15-24.
- [6] Wu Yan. Further implement the strategic action of education digitalization, and lead the modernization of Education in China with the support of education digitalization [J]. Higher Education in China, 2023 (02): 5-10.
- [7] Zhang Zhixin, Zheng Xiaoming, Qian Chen. The integration of "four chains" enables new qualitative productivity: internal logic and practice path [J / OL]. Journal of Shandong University (Philosophy and Social Sciences Edition), 2024 (03): 1-12.
- [8] Xu Kangning. The development pattern and basic trend of the world digital economy [J]. People's Forum, 2023 (06): 85-89.
- [9] Jiang Dayuan. Several concepts of work, occupation and education [J]. Research on the development of Vocational Education, 2022 (04): 1-11.
- [10] Justin Yifu Lin, Fu Caihui. Chinese modernization: Blueprint, Connotation and Primary task —— Interpretation of social science from the perspective of new structural economics [J]. Science Digest, 2023 (01): 59-61.
- [11] The World Higher Education Digital Development Report Research Group. The generation logic, scientific connotation and practical application of the Digital Development Index of World Higher Education [J]. Higher Education in China, 2023 (02): 11-15 + 26.
- [12] Zhuang Xishan. Modernization of Chinese Vocational Education: Connotation, Picture and Path [J]. Higher Education Research in China, 2023 (02): 96-101.
- [13] Shi Weiping. —— Re-read the "Problems and Thoughts in the Curriculum Reform of Vocational Education in China" [J]. Vocational and Technical Education in China, 2023, (35): 29-32.
- [14] Sun Miantao, Wu Tingyan. The triple logic of the national construction of a high-quality education system [J]. Modern Education Management, 2022 (12): 1-10.