RESEARCH ARTICLE

Construction of Curriculum Ssystem of Port and Shipping Logistics Specialty Group Driven by New Quality Production

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Abstract: In order to enhance the professional adaptability of port and shipping logistics talents, this paper analyzes the impact of new quality productivity on the port and shipping logistics industry, and proposes a construction plan for the course system of the port and shipping logistics professional group based on new quality production. The aim is to integrate and optimize the course content, improve the professional literacy and practical ability of port and shipping logistics talents, and meet the new needs of industry development. The study elaborates in detail on the principles, objectives, content, and implementation paths of curriculum system design, in order to provide useful references for the teaching reform of port and shipping logistics majors in universities.

Keywords: New quality productivity; Vocational education; Port and shipping logistics; Professional groups; Curriculum system

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1.Introduction

The new quality productivity has opened up a new perspective for China to start Chinese path to modernization national construction [1]. It is a process of transformation from traditional industrialization to digitalization and intelligence in the context of highly developed information technology. It is not only reflected in the high improvement of production efficiency, but also in the innovation of production methods and the reconstruction of production relations. New Quality Production emphasizes data-driven and algorithm driven decision-making, as well as full process transparency and automation achieved through technologies such as the Internet of Things, artificial intelligence, and blockchain. In the field of port and shipping logistics, new quality production has promoted the application of new technologies such as intelligent ports, unmanned ships, and logistics big data analysis, improving the operational efficiency and service quality of the industry, and posing new challenges and demands for talent cultivation.

In the new era, the path to high-quality development of vocational education is the integration of industry and education. Optimize and improve the integration of industry and education to enhance the quality of talent cultivation in vocational colleges in the new era, promote the development and progress of vocational education, and meet the demand of enterprises and society for high-quality technical and skilled talents. At present, the Port and Shipping Logistics professional group needs to serve the national strategy and

the goal of building a world-class port group, carry out multi-level cooperation between schools and ports in all aspects, and systematically build a high-level composite technical and skilled talent training system with typical "port+shipping+transportation" characteristics. It is urgent to improve the integrated design curriculum system and innovative engineering combined training mode of the professional group.

2.Analysis of the adaptability status of port logistics majors in vocational colleges

2.1 Current situation of port logistics major in vocational colleges

In 2023, there will be a total of 37 vocational colleges across the country offering majors related to port and shipping logistics, widely distributed throughout the country, with a higher number of vocational colleges in Shandong, Guangdong, Hubei, and other regions. These universities are committed to cultivating professional talents in port and shipping management, modern logistics management, and other fields to meet the growing demand of the logistics industry. From the current situation, the Port and Shipping Logistics major is showing a vigorous development trend in vocational colleges, with the development of professional groups, close industry development trends, optimized curriculum settings, strengthened practical teaching links, enhanced students' practical operation abilities, deep cooperation with enterprises, and the integration of industry and education, providing students with more internship and employment opportunities. At the same time, the number and distribution of port and shipping logistics majors in vocational colleges are constantly increasing, and the teaching quality and employment prospects have been significantly improved, cultivating high-quality technical and skilled talents in the field of port and shipping logistics.

The port and shipping logistics professional group is an important part of modern supply chain. In recent years, the trend of integration and reconstruction of large logistics, large majors, and large industries has been strengthened, and the connotation of traditional positions has been expanded while new positions continue to emerge. As a result, the connotation and extension of the port and shipping logistics professional group need to be expanded, and a large number of digital and technical skilled talents need to be cultivated to adapt to the development of the port and shipping logistics industry. The Port and Shipping Logistics major group in vocational colleges includes different majors, including Port and Shipping Management, Logistics Management, Container Transport Management, and Waterway Transport Safety Management. Intended to cultivate professional technical talents with skills in port, shipping, and modern logistics management. Exploring the connotation of new quality productivity and empowering the release of industrial momentum. The integration of new technologies into the port and shipping logistics supply chain, such as automated terminals, drone delivery, blockchain supply chain management, etc., has led to a highly technological and networked nature of the port and shipping logistics industry. However, the current education program and curriculum system for port and shipping logistics are lagging behind the development of the industry to a certain extent, and there is a certain disconnect between the professional curriculum and actual needs. It is urgent to update educational concepts and teaching content to cultivate high-quality talents that meet the needs of new quality production.

2.2 The necessity and urgency of constructing the curriculum system for the port and shipping logistics professional group

The construction of the curriculum system for the Port and Shipping Logistics professional group under the new quality productivity is particularly urgent. The traditional education model cannot meet the industry's requirements for interdisciplinary knowledge, innovation ability, and practical operation ability. Students need to possess emerging skills such as data analysis, artificial intelligence applications, and digital management, but the current curriculum focuses on theoretical knowledge and cannot meet the cultivation of cutting-edge technologies.

Firstly, the curriculum system needs to keep pace

with the times and integrate modern technological content such as big data analysis, intelligent technology, and blockchain applications. This not only enhances students' technical sensitivity, but also strengthens their adaptability and innovation ability in the future workplace. Secondly, strengthen the practical teaching process by using simulation training, internship training, and other methods to enable students to learn and apply knowledge in real or near real work environments. In addition, interdisciplinary curriculum design should be promoted to encourage students to transfer knowledge and integrate technology between different fields, in order to enhance their overall quality.

At the same time, establish close cooperative relationships with port and shipping logistics enterprises, introduce industry experts to participate in curriculum development and talent cultivation, and ensure the timeliness and practicality of educational content. Course updates should be flexible and respond quickly to market changes and technological developments. Establish a continuous course evaluation and feedback mechanism, adjust course settings in a timely manner based on industry trends and student feedback, and ensure the quality of education.

3. Analysis of the impact of new quality productivity on port and shipping logistics

3.1 Technological innovation brings about changes in port and shipping logistics

New quality productivity stimulates innovation vitality, promotes profound changes in the port and shipping logistics industry, and drives regional economic prosperity. The application of advanced technologies such as automated docks, unmanned ships, the Internet of Things (IoT), big data analysis, and artificial intelligence (AI) can improve logistics efficiency and reduce operating costs. The implementation of fully automated terminals has significantly improved loading and unloading speed and reduced human errors through unmanned guided vehicles (AGVs) and yard cranes. The Internet of Things technology has created precise and efficient tracking of the entire lifecycle of goods, big data analysis has optimized route planning and inventory management, and AI's intelligent prediction and decision support have further enhanced the transparency and response speed of the entire supply chain.

3.2 New requirements for talent cultivation due to changes in market demand

Under the new quality productivity model, market demand presents more obvious characteristics such as personalization, customization, and immediacy. This poses new challenges to the knowledge structure and skill requirements of port and shipping logistics talents. A composite talent with interdisciplinary knowledge, such as information technology, data analysis, supply chain management, and environmental and sustainable development awareness, is required to quickly adapt to new tools and technologies, as well as the skills to make decisions and solve problems in complex environments. The cultivation plan and curriculum system for vocational port and shipping talents should closely follow new technologies, requirements, and trends, and cultivate professional talents with innovative thinking and global perspectives.

3.3 The integration of the industrial chain promotes collaboration among professional groups

New quality productivity emphasizes the deep integration between industries. As an important component of the global economic lifeline, port and shipping logistics is increasingly synergistic with manufacturing, retail, finance, and other industries. By establishing cross industry strategic alliances, port and shipping logistics can achieve resource sharing and improve the overall efficiency of the supply chain. For example, collaborating with manufacturers for production and demand forecasting to optimize inventory and transportation plans; Collaborate with financial institutions to provide supply chain finance services and alleviate financial pressure; Collaborate with retailers to achieve inventory transparency and reduce excessive inventory and out of stock situations. This integration of the industry chain requires a high degree of collaboration between different professions within the port and shipping

logistics professional group, jointly enhancing the competitiveness and service level of the entire industry. The curriculum and teaching content of professional groups need to reflect the trend of cross disciplinary cooperation.

4.Theoretical basis for constructing the curriculum system

4.1Group building logic for port and shipping logistics majors in vocational colleges

In order to enhance the targeted training of port and shipping talents, relying on the economic and social development needs of Shandong Province and the development needs of Shandong Port Group enterprises, we will jointly analyze the employment demand and typical job tasks of the world-class port group in Shandong Province, study the professional abilities required by the job group, and determine the talent positioning of the port and shipping logistics professional group.

Establish a professional group of port and shipping logistics consisting of six majors, including port and shipping management, container transport management, modern logistics management, customs affairs and foreign trade services, and water transport safety management. Focusing on the school running position of integrating marine strategy, serving port and shipping logistics, and cultivating excellent talents, give play to the advantages of the professional group of the college, and improve the accuracy and progressiveness of the talent positioning of the professional group of port and shipping logistics by integrating industry concepts, post needs, and digital technology. To dynamically adapt to the changes in port development, it is necessary to achieve the functions of each profession within the professional group that have their own focus and characteristics, as well as mutual support and complementarity.

Implementing the concept of new quality development, cross disciplinary integration, careful planning and cultivation, overall improving the quality of talent cultivation in various majors of the college, and enhancing scientific research and social service capabilities. The logic of group building is mainly based on three aspects: industry demand, resource integration, and teaching optimization.

The establishment of professional groups is synchronized with industry development, reflecting the requirements of new technologies and formats. The development of global trade and the adjustment of international trade structure have led to a trend of diversification, intelligence, and greenness in the port and shipping logistics industry. Therefore, the professional group usually includes majors such as logistics management, port business management, shipping management, supply chain management, etc., to meet the talent needs of different directions.

Enhance teaching effectiveness through resource integration. When constructing professional clusters, vocational colleges consider grouping highly relevant majors together, sharing resources such as faculty and training facilities, achieving complementary and integrated teaching content, improving the efficiency of teaching resource utilization, and promoting knowledge and skill complementarity between majors.

From a teaching perspective, the construction of professional groups helps optimize the curriculum system, achieve organic connection and deep integration of course content, avoid repetitive teaching, and improve students' comprehensive vocational abilities.

4.2 Curriculum system design from the perspective of education

The curriculum system design from the perspective of education emphasizes student-centered approach, focusing on cultivating students' comprehensive qualities and innovative abilities. The curriculum system should be based on the systematic, scientific, and practical knowledge structure, ensuring that students can comprehensively master the core knowledge of their professional field. Pay attention to students' learning interests and development needs, and through modular and layered curriculum design, enable students to have different learning goals and challenges at different stages. Practical teaching and project-based

learning are important components from the perspective of education, which can enhance students' practical operation ability and problem-solving ability, and promote the deep integration of theory and practice.

4.3 Professional setting and adjustment from the perspective of economics

From an economic perspective, the establishment and adjustment of majors should take into account the market's demand for talent and the industry's economic development trends. The construction of the curriculum system for the Port and Shipping Logistics professional group should analyze the cyclical and regional characteristics of industry development, as well as the impact of new technologies and policies on the industry. With the rapid development of globalization and e-commerce, there is an increasing demand for courses in fields such as international logistics and supply chain management. The curriculum system should have a certain degree of flexibility to adapt to changes in the economic environment, such as timely addition of emerging courses, such as the application of big data analysis in logistics, green logistics, etc., to cultivate composite talents that meet market demand.

4.4 Collaboration and optimization of professional groups from the perspective of logistics

The perspective of logistics studies focuses on collaboration and optimization between majors to enhance the educational effectiveness of the entire professional group. In the port and shipping logistics professional group, different majors such as port management, navigation technology, logistics management, etc. need to support each other and form an organic whole. Course design should emphasize the cross disciplinary integration of courses, incorporating case analysis of logistics management, while logistics management courses can cover practical content of port operations. By establishing cross disciplinary practice projects and teams, we aim to cultivate students' teamwork and cross disciplinary communication skills to meet the diverse needs of the logistics industry. The logistics perspective also emphasizes the close connection with industry standards and practices, and course content should be regularly updated to reflect the latest developments and technological advancements in the industry.

5.Construction and guarantee system of course system for port and shipping logistics professional group

5.1 Goal positioning of the curriculum system

The goal of constructing the curriculum system is to cultivate skilled professionals in the field of port, shipping, and logistics who can adapt to the demands of new quality productivity through digital technology. Not only should one master traditional knowledge of port and shipping logistics, but also possess interdisciplinary perspectives such as information technology, data analysis, supply chain management, as well as environmental protection and sustainability. Ensure that students can quickly adapt to industry changes after graduation, possess the ability to solve complex problems, apply innovative thinking in practical work, and have good teamwork and leadership skills.

5.2 Integrated course design system for port and shipping logistics professional group

The overall idea of optimizing the design of professional groups is to organize research on the current situation and adjustment direction of the existing curriculum system of each major based on the construction plan of the professional group curriculum system of "bottom level sharing, middle level separation, and high-level mutual selection". There are two problems with the current curriculum system of the professional group: firstly, there are too many courses, ranging from 20 to 27; Secondly, the curriculum is segmented into blocks and lacks modular design.As shown in Table 1.

The structural layout of the curriculum system is based

Table 1 List of Course System for Port and Shipping Logistics Professional Group

Course	Port and shipping management 5+6+10=21 course	Container transport management 6+7+11=24 course	Modern logistics management 8+8+9=25 course	Customs affairs and foreign trade services 4+10+6=20 course	Water transport safety management 8+8+11=27 course
Major basic courses	International trade affairs	International trade affairs	International trade geography	Common knowledge and practice of goods learning	Introduction to navigation
	International shipping geography	International logistics geography	Basic knowledge and practice of international trade	International trade geography	Introduction to navigation
	Common knowledge and practice of goods learning	Common knowledge and practice of goods learning	Common knowledge and practice of goods learning	practice of international trade; international trade affairs	Maritime Integrated English
	Container transport practice	Port tally business	Aaccounting basis	Aaccounting basis	Maritime comprehensive English
	Foreign trade document practice	Foreign trade documents business	Modern logistics management		Basic security business
		Intelligent storage and distribution	Foreign trade document practice		Introduction to water transportation safety
			Logistics information management		Cosco transportation business
			Logistics procurement management		Maritime English speaking practical training
Professional core course	Port depot management	Port depot management	Shipping business letter and telecommunications	Customs policy and basic knowledge	Crew labor management
	Container terminal business management	Container transport practice	Logistics cost and performance management	Customs business skills	Ship management
	Port handling work organization	Container terminal business management	Storage and distribution management practice	Import and export commodities are classified into practice	International freight forwarder practice
	Port tally business	Port handling work organization	International freight forwarder theory and practice	International freight forwarder practice	International Ship Agent
	International Ship Agent	Port tally English	Container transport practice	Foreign trade document practice	Management of dangerous goods transportation
	International Cargo Agent	Ship agent business	Smart supply chain management	Ship agent business	Comprehensive practical training of crew members' labor service
		Shipping freight agent	International trade comprehensive training	Shipping business letter and telecommunications	Comprehensive practical training of crew members' labor service
			Post internship	Cargo English	Bilingual practical training of ship agents
				Comprehensive practical training of international freight forwarders	Post internship
				Post internship	
Major direction class	Maritime cargo transportation and insurance	海上货物运输与保险业务	物流英语	International trade comprehensive training	Cruise port planning and management
	Ship principle and payload	船舶原理与配载	报关与报检实务	Foreign business English；foreign trade English	Maritime geography
	Shipping business letter and telecommunications	航运业务函电	经济法	Overseas social media marketing	Workplace communication practice
	Maritime law and charter ships	Introduction to Smart Port	International Business Etiquette	Cross-border e-commerce B2B practice	名 HRM(human resource management)
	International multimodal transport theory and practice	Accounting basis	Logistics 1 + X comprehensive practical training	Modern logistics management	Accounting basis
	Introduction to Smart Port	Economic law	foreign business English；foreign trade English	Container transport practice	Marketing management
	Introduction to navigation	International multimodal transport theory and practice	Import and export commodities are classified into practice		Maritime regulation application training
	The Container Terminal Operating System	Container liner simulation system	Self-management and communication and cooperation		Navigation instrument operation training
	Container yard operating system	The Container Terminal Operating System	Logistics system planning and design		Operation of ship communication equipment
	Post internship	Container yard operating system			Comprehensive training of ship measurement
		Post internship			Comprehensive training of ship navigation

on the principles of modularization and diversification, and is divided into four main parts: basic courses, professional core courses, elective courses, and practical teaching. Basic courses provide necessary general knowledge, such as economics, management, and information technology fundamentals. Professional core courses delve into key areas of port and shipping logistics, such as port operations, international logistics, and ship management. Elective courses allow students to choose directions such as supply chain optimization, intelligent logistics, and green logistics for in-depth learning based on their personal interests and career plans. The practical teaching process includes internships, project research, simulated training, etc., to enhance students' practical abilities and application skills.

5.2.1 Bottom layer sharing

8 out of 6 basic courses for the Port and Shipping Logistics major group (excluding waterway transportation safety management major),As shown in Table 2.

Table 2 List of Basic Course Sharing at the Bottom Level of the Port and Shipping Logistics Professional Group

International Trade Practice	International shipping (trade, logistics) geography
Common knowledge and practice of cargo science	Shipping business correspondence
Accounting Fundamentals	Container Transportation Practice
Foreign Trade Document Practice	Modern Logistics Management

5.2.2 Middle level separation

Each major selects 7 courses as its core courses based on its own professional talent cultivation positioning,

implements course consolidation, and carries out modular teaching of courses.

5.2.3 High level mutual selection

Each major, based on its own professional training positioning and employment orientation, conducts research on enterprise needs and employment, and offers about 7 professional courses to cultivate students' vocational adaptability and sustainable development ability.

The curriculum construction fully relies on the curriculum research and development center of the Industrial College, and the school enterprise jointly develops the professional curriculum system, implements educational plans, and certification assessment models. Relying on the New Textbook Development Center of the Industrial College, by focusing on job standards and job content, reconstructing the textbook content section, and developing a new type of loose leaf textbook. Elective courses such as "Supply Chain Strategy", "The Application of Big Data in Logistics", "Green Logistics and Sustainable Development", etc., aim to broaden students' knowledge areas and enable them to pay attention to the latest trends and developments in the industry.

The characteristics of the curriculum system lie in its dynamism and flexibility, which can timely reflect industry changes, regularly update course content, and introduce industry practice cases. Emphasize interdisciplinary integration, such as integrating cutting-edge technologies such as data analysis and artificial intelligence into logistics management courses, to cultivate students' innovative thinking and technological application abilities. The highlight is also reflected in its close cooperation with the industry, providing internship and employment platforms for students through school enterprise cooperation projects, achieving seamless integration of theory and practice, and improving the employment competitiveness of graduates.

5.3 Guarantee measures for the integrated curriculum design of port and shipping logistics professional group

5.3.1 Building a high-level "dual post, dual teacher, dual ability" teaching team

Promote the allocation of fixed and mobile teaching staff, and implement the construction of a "dual post, dual teacher, dual ability" teaching staff team. By increasing the two-way mobility, dual position appointment, and dual capability development of enterprise business experts and full-time teachers in schools, we aim to build a "dual teacher" teaching team that is suitable for talent cultivation in industrial colleges, and develop sustained scientific research and teaching capabilities in areas such as talent cultivation, project research and development, and international exchanges.

Through collaborative projects between industry, academia, research, and enterprises, the school selects teachers to practice and train in enterprises every year to enhance their practical teaching abilities and provide better learning support for students. Integrating teachers into actual enterprise projects, regularly organizing industry experts to provide advanced business skills training, improving teachers' practical abilities and project development experience, enriching cutting-edge knowledge in the industry, promoting the improvement of teachers' research, practice, and application levels, and focusing on polishing course content and teaching cases.

Hire outstanding management and technical personnel from enterprises to serve as core course teachers, enterprise position masters, and innovation and entrepreneurship mentors. The teaching team has gathered several renowned experts in the port logistics industry and outstanding frontline port logistics practitioners to directly participate in daily teaching, allowing students to "learn by doing" and "learn by doing", discovering and solving problems in the process of constantly handling business.

5.3.2Constructing a real-life and productive practical training base

Introduce the resources, equipment, technology, personnel, and project advantages of leading port and shipping logistics enterprises, gather on campus and off campus resources, and build real-life and productive practical training bases. Implement practical training teaching gradually from three gradients: virtual simulation,

real-life practice, and production operation. The school enterprise cooperation aims to create a practical teaching platform for port and shipping logistics, introducing real industrial environments and real project cases into various aspects of practical teaching, allowing students to experience and immerse themselves in real industrial environments and job processes as "prospective employees", and to experience and understand the distribution system and governance mode of enterprises in advance, effectively improving students' professional comprehensive literacy, business practice ability, ability to solve complex problems, and innovation ability.

Optimize the resource control and governance system of the Port and Shipping Geography Comprehensive Training Room, Port Business Simulation Training Room, Port Loading and Unloading Process Training Room, Cargo Science Teaching Training Room, Container Automation Terminal Simulation Training Room, Modern Logistics Training Base, and tally 1+X Training Room. In the daily teaching process, these high-quality resources should be fully utilized. Students can conduct practical production training through these software to simulate various aspects of the business process. The software is connected to the simulation port logistics service platform through relevant technical interfaces, allowing students to have a more practical sense of participation in work and better improve the process of students' knowledge and concept transformation and practical skills.

6.Conclusion

Empowering the development of the port and shipping industry with new quality productivity [5], the trend of digitalization and intelligence in the port and shipping industry is intensifying, green and sustainable, global integration is developing, and soft skills requirements are being upgraded. Higher vocational port and shipping majors are required to cultivate students, paying more attention to cultivating students' digital literacy, innovation ability, friendly economy, international vision, and spirit of integration. The corresponding curriculum concepts and modules in the construction of professional group textbooks should reflect the content and formats of automation technology, data algorithms, dual carbon green, global supply chain, and coordinated sum.

The practice of constructing a curriculum system is a continuous process of optimization. Integrating timeliness, systematicity, and evaluability requires constantly adapting to the dynamics of industry changes and educational environments. The combination of technology and practice, the emphasis on theory and application, and the construction of a curriculum system enable interdisciplinary integration, strengthen practical activities, and cultivate students' innovative thinking and problem-solving abilities.

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