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A Brief Discussion on the Cultivation of Applied Maritime Talents under the New Mode of Intelligent Shipping

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Abstract: This paper mainly elaborates on the development of navigation specialties towards intelligence by analyzing the current situation of cultivating applied maritime talents under the new model of intelligent shipping in China. It introduces the methods of cultivating applied maritime talents, the demand and structural changes for such talents in the intelligent shipping industry, and puts forward specific plans for the new training trends, concepts and systems of applied maritime talents. The realization of intelligent shipping will significantly improve shipping efficiency, safety and environmental protection, provide strong support for the development of the global economy and trade. It will also change the allocation structure and market demand of applied maritime talents.

Keywords: Intelligent Shipping; Cultivation of Applied Maritime Talents; Navigation Education; Reforms and Innovations; Unmanned Ships

1. Introduction

With the rapid development of technology, intelligent shipping has become an important research direction and development trend in the shipping field. Shipping, as an important mode of transportation for global trade, plays a vital role in the development of the world economy. However, traditional shipping still faces many challenges such as low efficiency, high safety risks, and environmental pollution. The emergence of intelligent shipping provides new ideas and methods to solve these problems. By integrating advanced technologies such as artificial intelligence, big data, 5G, sensors and remote control, intelligent shipping is expected to achieve the intelligent transformation and upgrading of the shipping industry.[1-3] Nowadays, informatization is sweeping the world. Under the impact of informatization and technologies such as artificial intelligence, big data, 5G, sensors and remote control, all industries are strongly affected. Either adapt to the development of the times and carry out in-depth informatization and intelligent upgrading of the industry; or remain complacent, gradually decline until eventually being eliminated by the times. The shipping industry is also being impacted by informatization and intelligence, and is transforming the traditional shipping industry into an intelligent shipping industry to adapt to the development of informatization and intelligence[4]. With the continuous development of China's economic strength and technological level, the application of artificial intelligence technology and knowledge such as big data, 5G, sensors and remote control is also constantly popularizing in people's lives. In this environment, applying these new high-tech technologies in the shipping industry can enhance the development of China's shipping industry. In the history of China's development, the shipping industry has always been an enduring industry. Eighty percent of China's import and export goods are transported by the shipping industry. This shows the significance of applying these new technologies to the shipping industry. To introduce these new technologies into the shipping industry, highly professional applied maritime talents are needed to introduce them into the industry, strengthen the technological upgrading in the industry, and enable the shipping industry to keep pace with the development of the times. If we want to cultivate new applied maritime talents, we need to innovate and reform the existing traditional teaching mode, form a complete set of training programs for applied maritime talents in China, and should predict the problems that may be encountered in the actual process of cultivating applied maritime talents, and propose effective solutions. Moreover, the progress of cultivating applied

maritime talents should be adjusted in time according to the intelligent progress of the shipping industry, and specific solutions should also be actively proposed for the transformation of existing applied maritime talents so that they can adapt to the development of intelligent shipping in the future as soon as possible.

2. The Current Situation of Cultivating applied maritime talents under the New Model of Intelligent Shipping in China

The current situation of cultivating applied maritime talents for intelligent shipping in China shows a positive development trend, but at the same time, it also faces some challenges. With the continuous development and application of intelligent shipping technology, the field of navigation education is also undergoing corresponding reforms and innovations to meet the needs of intelligent shipping. However, the current situation and problems of navigation education in China also reveal that there is a serious disconnect between the supply of applied maritime talents at the current stage and the demand of the social market, and the cultivation of students' comprehensive quality and the combination of intelligent shipping and current navigation education is neglected. For example, compared with developed countries, although navigation graduates in China have received three to four years of study during school, schools have not effectively combined knowledge such as artificial intelligence, big data, 5G, sensors and remote control technology into the theoretical knowledge and practical operation ability of navigation major to cultivate new applied maritime talents during the teaching process, resulting in the existing applied maritime talents being unable to adapt to the shipping industry under the new model of intelligent shipping in the future. In addition, the low comprehensive quality is also a problem. Higher education is generally affected by basic education, paying too much attention to the grades and neglecting the expansion of students' comprehensive ability and the improvement of other professional and practical abilities[5]. In order to improve the practical and innovative ability of applied maritime talents, the fundamental way is to provide them with the opportunity to personally participate in experiments and practices, establish a practical teaching system oriented to "solving practical problems in the future", increase comprehensive experiments and practical training on the application of knowledge such as artificial intelligence, big data, 5G, sensors and remote control technology in navigation, and effectively improve the practical ability of applied maritime talents and the development of the shipping industry under the new model of intelligent shipping in the future. At the same time, a dynamic adjustment mechanism for cultivating applied maritime talents should be constructed to ensure that the cultivation of applied maritime talents meets the current and future development requirements of the shipping industry.

3. The Demand and Structural Changes for applied maritime talents under the New Model of Intelligent Shipping

With the transformation of the intelligent shipping business model, the employment demand and structure of applied maritime talents will undergo significant changes. For example, in the process of the coexistence of unmanned ships and traditional ships and even the full realization of the market-oriented operation of unmanned ships, traditional applied maritime talents will gradually shift from on-board work to land-based work. Some positions may be eliminated, but at the same time, new employment opportunities will be created, such as different departments of the shore-based monitoring center, unmanned ship maintenance bases, intelligent control system development, logistics docking with the maritime system, and emergency support on board and other jobs. The number of on-board personnel decreases, while the number of shore-based service personnel increases, and the knowledge and skills requirements for relevant practitioners will also be higher[6]. Moreover, the improvement of the intelligent level of ships will lead to a gradual reduction in ship crew. The development goal of unmanned ships is to achieve no crew on board, but this will be a gradual process. During this process, the number of on-board crew positions will further decline, and the occupational characteristics of crew members will also change to a certain extent. In traditional shipping, crew members need to face poor working and living conditions on

board, as well as high risks of illness and injury, and it is often difficult to obtain timely and effective solutions in emergency situations. With the development of unmanned ship technology, crew members will be transformed into two types: shore-based staff and on-board staff. Among them, most shore-based staff are mainly responsible for remotely controlling unmanned ships and do not need to travel with the ship; on-board staff are mainly responsible for emergency control and equipment maintenance and repair, the division of on-board working departments will also change, and ships will be operated with the help of artificial intelligence. When autonomous navigation technology matures and becomes popular, the manual labor that crew members originally engaged in on board will be transformed into the operation of the intelligent integrated platform on the shore, thus getting rid of the boring, isolated and resource-scarce working environment, and the working environment will be qualitatively improved. Intelligent ships integrate many advanced technologies, and applied maritime talents need to reconstruct their knowledge system and increase their understanding and application ability of knowledge such as artificial intelligence, big data, 5G, sensors and remote control technology. However, cultivating new applied maritime talents with a more complete knowledge structure and more cutting-edge knowledge content requires an "upgrade" in instructors, equipment and time, which will lead to an increase in training costs[7]. Existing applied maritime talents need to actively update their theoretical knowledge and practical skills of intelligent shipping to adapt to on-board work of intelligent ships or remote control on shore-based. The career development path of applied maritime talents is no longer limited to traditional promotions on board but also includes transformation to shore-based related positions. The talent structure required for intelligent shipping has changed, and the requirements for the comprehensive quality of applied maritime talents are getting higher and higher. applied maritime talents who master intelligent ship control technology, have rich navigation experience, and have high management ability and technical level will be more favored. applied maritime talents need to continuously improve their ability to become

knowledge-intensive and comprehensive talents. As a necessary resource for shipping development in the new era, human resources have always occupied a very important position. Intelligent shipping is a new type of technology that applies intelligent control technology to the shipping industry. Intelligent shipping has transformed the traditional shipping industry's demand for applied maritime talents. The intelligent shipping industry not only requires applied maritime talents to have more solid basic navigation knowledge, but also requires applied maritime talents to understand and master artificial intelligence-related knowledge and computer engineering-related technologies, big data, 5G, sensors and remote control technology, etc. applied maritime talents need to have very high professionalism and a more comprehensive understanding of the shipping industry. New applied maritime talents should, in terms of professional ability, not only meet the demand for professional skills of applied maritime talents, but also meet the requirements of the future development of the shipping industry towards intelligence.

4. The Cultivation Trends and Concepts of Applied Maritime Talents under the New Model of Intelligent Shipping

In today's era of rapid development of the information age, people's pace of life is also gradually accelerating. Navigation colleges and training institutions, as well as applied maritime talents, should keep pace with the times and adapt to the development of the times. First of all, the demand for cultivating applied maritime talents is also developing in a diversified direction. In the new era, applied maritime talents not only need to learn relevant professional knowledge, but also should learn relevant knowledge of artificial intelligence, big data, 5G, sensors and remote control technology, etc., which can enable the navigation major to develop in the direction of informatization and intelligence; cultivating diversified applied maritime talents can also make the navigation major more diversified. Secondly, navigation colleges and training institutions should shift the focus of talent cultivation for the navigation major from previously emphasizing the cultivation of students' professional navigation knowledge to currently emphasizing the cultivation of

intelligence and informatization in the shipping industry, so as to accelerate the application of various new technologies in the shipping industry and enable the shipping industry to keep up with the pace of the times. Thirdly, when cultivating informatized and intelligent applied maritime talents, navigation colleges and training institutions focus on interactive teaching for applied maritime talents. In the process of intelligence, the most important thing is human-computer interaction. Human-computer interaction enables people to communicate with ships and various machines on the ships, which reflects the importance of interaction[8]. In the daily teaching process, attention should be paid to cultivating students' innovation in machine interaction ability, allowing students to collaborate with machines to achieve course goals. At the theoretical level, a complete human-computer interaction education system should be established around students; at the practical level, students can operate the interactive machines to familiarize themselves with the process of interacting with machines, cultivate students' professional skills, and better achieve interactive teaching. Finally, in the actual process of cultivating applied maritime talents, navigation colleges and training institutions have diverse requirements for applied maritime talents, requiring the diversity and efficiency of applied maritime talents' own knowledge and skills. This can further improve the teaching methods in the education process of applied maritime talents and enable the education industry to form a complete training method for applied maritime talents; and it is required that the education methods of application-oriented navigation majors be more precise, cultivate highly adaptable specialized talents, and make the management of application-oriented navigation majors more efficient. According to the analysis of the viewpoints proposed by the above-mentioned training methods for applied maritime talents under the new model of intelligent shipping, it can be known that the key to cultivating intelligent applied maritime talents in the new era lies in the development of artificial intelligence technology. We should establish an education concept of people-oriented, cultivate a more complete and innovative education method for applied maritime talents, and further strengthen the professionalism of

applied maritime talents themselves. In the process of cultivating applied maritime talents, it is necessary to keep up with the development needs of the market in a timely manner, understand the first-hand dynamics of market demand, understand the latest characteristics of the times, and formulate the cultivation direction of applied maritime talents based on this industry demand, increase the adaptability of applied maritime talents to the intelligent shipping industry environment, and cultivate more applicable and more professional new applied maritime talents.

5. The Training System for Applied Maritime Talents Facing the New Model of Intelligent Shipping

The development of an industry will inevitably lead to the update of related majors in this industry and drive the renewal of the education system. Today's society is a diversified one. In the current society, single-skilled talents have obvious disadvantages. They cannot adapt well to the pace of social development, fall behind in social development technologies, and do not meet the needs of the society for compound talents. For the cultivation of diversified talents, the barriers between disciplines should be broken and unrelated disciplines should be integrated. Navigation colleges should provide basic education to lower-grade students to cultivate their basic abilities; for middle-grade students, focus on the advanced cultivation of students' professional knowledge to enable them to have a more complete reserve of professional knowledge; for senior students, cultivate the theoretical basis for students to learn various cutting-edge technologies, cultivate students' basic understanding of emerging technologies, and promote the integration of traditional shipping industry with various high and new technologies to improve students' own diversified abilities and compound knowledge reserves. To carry out a perfect cultivation of applied maritime talents, targeted training must be carried out. Navigation colleges should build a targeted talent cultivation platform for the cultivation plan of applied maritime talents, so as to cultivate applied maritime talents more perfectly[9,10]. The best way to cultivate students' professional abilities is still through practical training. Practical training can more effectively promote applied maritime talents'

mastery of professional knowledge and also enable them to study more efficiently. Establishing a professional platform that spans grades allows students, various professional tutors, and scientific researchers to enter the platform, enables students' problems encountered in learning to be answered in a timely manner, and enables effective supervision of students' own learning situations, allowing students to study more attentively and effectively. Establishing a connection platform between enterprises and schools can better promote students' understanding of the actual development of society and the actual problems faced by the shipping industry in actual work, increase students' application of professional skills, enable students to apply the knowledge they have learned to actual work, and enable students to understand their mastery of the knowledge they have learned, allowing students to better connect with society.

6. Conclusion

Intelligent shipping, as the future development direction of the shipping industry, has huge potential and broad prospects. Although it still faces many challenges at present, with the continuous progress of technology, the gradual improvement of regulations and the cultivation of talents, intelligent shipping will bring profound changes to the shipping industry, improve the competitiveness and sustainable development ability of shipping, and make greater contributions to the prosperity of the global economy. With the development of the information and intelligent era, it has given people a lot of opportunities to meet new opportunities and challenges. The shipping industry has also suffered the impact of the development of the information and intelligent era. To adapt to the development process of the new era, it should actively change itself to conform to the development trend of this era, cultivate new applied maritime talents that conform to the development process of the times, update the original education and teaching methods, improve the training of relevant skills of applied maritime talents, cultivate diversified applied maritime talents, promote the mutual integration of professional capabilities and high and new technologies, and achieve the common progress of the training of applied maritime talents and the

development of intelligent shipping. In order to adapt to the development of intelligent shipping, applied maritime talents need to continuously learn and improve themselves. Navigation colleges and training institutions also need to adjust training programs and teaching contents to cultivate high-quality talents in line with the new format of intelligent shipping. At the same time, relevant departments and enterprises can provide better career security and development support for applied maritime talents by strengthening top-level design, exerting the functions of maritime authorities, and promoting the transformation of educational concepts of navigation colleges and training institutions. To sum up, the training of applied maritime talents in intelligent shipping is gradually adapting to the needs of technological development. Through innovative education models and the cultivation of practical ability, efforts are made to improve the comprehensive quality and practical ability of applied maritime talents to adapt to the development trend of intelligent shipping.

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