



Maritime human resources training to serve the sustainable maritime economic development strategy: Status, Challenges and Countermeasures for Vietnam

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ABSTRACT

Vietnam is a coastal country, with more than 3,260 km of coastline and about 4,000 islands, 28/63 provinces, coastal cities. In the context that Vietnam is striving to become a maritime power nation; achieving basic criteria of sustainable maritime economic development; increasing capacity to respond to maritime security threats in the face of the 4.0 industrial revolution and globalization's challenges today, the training and developing of maritime human resources is important and breakthrough for the country's development. Human resources are a decisive factor in the success and progress of a country and are the main measure to evaluate the level of progress, equality and sustainable development of society. This article focuses on analyzing and interpreting the following issues: i) Overview of the theoretical issues of "maritime human resources"; ii) The status of Vietnam's maritime human resource education and training; iii) Inadequacies and challenges in Vietnam's maritime human resources training; iv) Countermeasures for Vietnam.

1. Introduction.

In the 21st century – the century of the sea and the ocean, most countries in the world have a need to be oriented towards the sea so the sea, islands in general, the South China Sea in particular has a important role for countries, including Vietnam. As a nation born from the sea, with the coastline of more than 3,260 km, about 4,000 large and small islands and two offshore islands, namely Hoang Sa (Paracel) and Truong Sa (Spratly), sea and islands plays a important role for Vietnam in all areas (from economy, politic, to cultur – society, defence, security) both in the past, present and future. This is the space of survival

and development of the nation, the base of livelihoods for millions of Vietnamese people from ancient times to today. Situated on the world's busiest bloodstream trade route, connecting the Pacific, Indian Ocean, Europe, Asia, the Middle East and Asia and its enormous natural resources, the South China Sea is the precondition for Vietnam's development of strong maritime economies. This is the only road to the sea and ocean of Vietnam, the main national gateway to connect with the region and the world, creating favourable conditions for the promotion, economic development and trade for the nations. Moreover, due to the characteristics of the S-shaped territory, stretching from north to south, the narrow breadth, sea and the islands is become the solid "barrier" to protect the country from enemy invasion by sea. Moreover, the sea and islands are integral part of the territory of Vietnam, not only a source of livelihood for the Vietnamese people but also a place where is shaped and preserved the cultural heritage of Vietnam for generations.

In the process of building, developing and protecting the country, in order to be able to preserve, maximize the huge role and potential of the sea, islands, manage the invaluable natu-

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ral resources in the South China Sea, Vietnam needs to build a team of maritime human resources with adequate qualities, skills and qualifications. It's a fundamental issue of exploiting, managing the seas, going into the sea, being the master of the nation's seas. However, the sea and the ocean are not a peaceful place that contains many dangers, risks from natural disasters and Man-made disaster, such as storms, tornadoes, dragons, crashes at sea, geopolitical conflicts between countries,... In order to advance to the sea, to be the master of the seas, people (especially the maritime human resources) must have sufficient health, intellect, skills, professional skills from transportation, tourism, scientific research, to defence, security,...

Accordingly, the maritime human resources must be properly and methodically educated and trained to be able to obey orders, manage risks, solve problems and have psychological and emotional stability to ensure safe, clean, efficient operation (Angelica et al, 2011). In that sense, the article will focus on training maritime human resources in Vietnam for sustainable maritime economic development. However, due to limited time and capacity, the article focuses only on the most general picture of maritime human resources training in Vietnam.

2. Methodology.

The research methodology of this article is based on qualitative analysis and practical evidence related to the education and training system of the sea and islands of Vietnam as well as practical experience in the enterprises using Vietnam's maritime human resources. The author has collected data from monographs, reference books, academic articles on human resources in general and maritime human resources in specifically in terms of definition, characteristics, roles, components, status of education and training, challenges, inaccessibility in education and training; solutions to improve the quality of education and training;... In particular, the author also conducted a survey of the programmes, training content of the Ministry of Education and Training from pre-primary school to high school; programmes and training contents of about 100 vocational education institutions and universities related to the sea, islands of Vietnam. In addition, the author also refers to information, data from international organizations such as International Maritime Organization, The Japan International Cooperation Agency and the results of research on a number of key scientific and technological topics at the state level of Vietnam.

3. Researching Results.

3.1. Overview of theoretical issues of "maritime human resources".

Although it has been and is being widely used in policy, laws documents and social life in many countries, including Vietnam, so far, none document and scientific research has provided a full explanation of the connotation of the concept of "maritime human resources". Domestic and Foreign Research works usually study "human resources" and have indicated that this term appeared in the 1980s of the 20th century when there

was a fundamental change in the way managing, using people in the field of labour economy. Human resources are resources of human, the most important element in the process of socio-economic development. This is a broad-based concept, which includes the following basic aspects: i) labour force; ii) population structure and labour structure; iii) population quality (intellect, physical strength, morality are the most important factors, determining the quality and strength of human resources). Besides, this term also indicates that people are seen as an internal, fundamental resource in the resource system of social development. Human resources are different from other resources in that only with them can other resources be effective and have positive significance for the development of society, so it is the resource of all resources.

Based on an understanding of the meaning of the term "human resource", it can be understood that "maritime human resource is a constituent part of human resources in general, including the scale, structure and specially the quality of human beings with all the characteristics from traditional to modern, both strengths and weaknesses, both talent and potential, including physical, mental and mental strengths of a part of citizen in society that has done, is being and will be involved in the management, exploitation, use, protection and conservation sea".

Human resources are both the subject and the object, the motivator and the goal of socio-economic processes, holding a central position not only in the resource system of social development but also of the social development itself, which is regarded as the most important asset of all nations, and therefore, investing in people has always been a must in the process of economic and social development of every country. It comes from the characteristic that maritime human resources are a constituent part of human resources in general, so maritime resources also have the role and characteristics of the human resources. In addition to these common roles and characteristics, maritime human resources have the following specific roles: *i)* the maritime human resources are both the entity planning, issuing, monitoring, ensuring enforcement, as well as the direct entity implementing the policies, laws on the sea and islands of the States; *ii)* Maritime human resources, especially high quality maritime human resources are important factors that determine the effectiveness of the implementation of the policies, laws on the sea and islands of the States; *iii)* Training and development of maritime human resources are key to success in sustainable economic development, management, using and protection of national maritime environmental resources. Skilled and advanced science and technology human resources are seen as crucial to the success of maritime strategies and economies; the "internal power" needed for nations to become a maritime powerful nation in the future.

To be able to perform the above roles, maritime human resources must meet the following basic requirements: *i)* have good health, especially to withstand the effects of waves, sea winds, resist the vibration, shaking of sea ships, as well as poor eating and living conditions of long sea trips; *ii)* be patriot, have a firm political identity, not be seduced, ransomed, threatened by external forces; *iii)* Be courageous, be able to endure being

away from home for a long time, be prepared to face natural disasters and maritime calamities; iv) have survival skills and self-defence skills at sea in bad weather, skillful skills in all types of occupations; v) be fully equipped with the necessary equipment as well as food, fresh water for the days of the sea trip; vi) have specialized knowledge, know foreign languages (especially English), are highly disciplined, are able to operate modern equipment; have knowledge of rescue and relief.

For Vietnam, maritime human resources are a wide range, including not only human resources that govern the state of the sea, but also human resources directly conducting activities on the sea of most sectors, such as: maritime economy, defence, maritime security, protection of maritime environmental resources, maritime science and technology; maritime policy and law formulation, international maritime disputes settlement; education, training, information, communication, ideas on the seas; international cooperation in the maritime field;...

Currently, there are no specific statistics on the number of Vietnamese maritime human resources. Current documents only provide data on specific maritime personnel, such as: Regarding the crew, according to the Ministry of Maritime Affairs, Vietnam currently has 43,390 sailors, including 4,255 Captains; 2,102 Chief officers; 4,607 Deck officers; 13,113 Sailors on duty; 4,052 Chief Engineers; 1,616 Second Machine; 4,559 Machine officer; 8,530 Mechanics on duty; 331 Electrical engineering officers; 577 Electricians. *Regarding fishermen*, according to the report of the General Directorate of Fisheries, Vietnam currently has 28 coastal provinces and cities with seafood exploitation with about 125 districts, towns and towns with fishing villages and about 700 communities engaged in maritime mining. On average, a seafood exploitation commune in Vietnam has about 400-400 fishermen, 100-400 fishing households with an average number of workers per household of about 3 people. (Vietnam Directorate of Fisheries, 2019).

3.2. Status of training of Vietnam's maritime human resources.

Maritime education and training is an essential path that opens up the future of development not only for Vietnam, but also for themselves and the families of seafarers; is an important way to improve the employment opportunities of millions of fishermen, and is a core driving force for Vietnam to advance to the sea and dominate the sea, sustainable development, contributing to promoting international cooperation, safeguarding regional and international peace and security. Therefore, Vietnamese government has issued strategies for the development of maritime human resources, such as: Resolution No. 09-NQ/TW dated February 9, 2007 "On Vietnam's maritime strategy until 2020" of the Central Committee of the Communist Party of Vietnam; Resolution No. 36 - NQ/TW dated October 22, 2018 on "the strategy for the sustainable development of Viet Nam's maritime economy by 2030, with vision towards 2045" of the Central Committee of the Communist Party of Vietnam; Decision No. 40/QD-TTg dated January 7, 2016 of the Prime Minister Approving the Overall Strategy for international integration through 2020, with a vision toward 2030; The 13th National Party Congress Resolution of the Viet Nam Communist party dated February 1, 2021; Decision No. 886/QD-

TTg dated July 24, 2023 on approving Plan with policies, solutions and resources for implementation of Comprehensive Planning for Development of Vietnam's Seaport System in 2021 - 2030 period, with a vision to 2050

Implementing the above-mentioned principles and policies, the Ministry of Education and Training has directed schools to "integrate teaching content about the sea and islands into subjects and educational activities. Education on Vietnam's sea and islands can be undertaken in the official hours of the subjects such as Vietnamese, Nature and Society, History, Geography, Science, Fine Arts and after-school educational activities. Depending on the content, characteristics and ability to integrate sea and islands education, schools choose the appropriate level of integration for two levels: the whole part (with separate topics about Vietnam's seas and islands); the section (which integrated content about Vietnam's seas and islands)" (Vu, 2010).

Since the 2012-2013 academic year, sea and the islands education and training in Vietnam has been carried out mainly through the national education system, including formal education and regular education (The National Assembly of Vietnam, 2019). The national education system consists educational levels and training levels from low to high: preschool education, general education (including primary, secondary and high school education), vocational education (primary, intermediate, college and other vocational training programmes), and higher education (university education, master, and doctoral level training). Sea and island issues are integrated in educational programmes at all levels, qualifications, specified into intensive training in vocational education and higher education. In addition, in many places, maritime human resources are re-trained in the workplace after being recruited. Depending on each education level, the sea and island are taught with different content and duration.

3.2.1. For general education levels.

The author's survey results of entire curriculum on the sea and island from preschool to high school have shown that there were no subjects about the sea or the island. The sea and islands contents are only taken into small lessons or items, sub-items, or paragraphs, pictures, diagrams, charts, etc of subjects such as Ethics, Citizen Education, Nature and Society, Vietnamese, Science, Geography, History, Art, Social Sciences,...

The maritime educational contents in the preschool and general education levels are flexible, suitable for the psycho-physiological and cognitive development of the students. For example: In the pre-school and primary school, the educational program focuses on introducing about sea, islands, maritime species, love of sea, island, the great contributions of the soldiers day and night guarding the sea and remote islands for children; Initially form children's awareness of protecting the maritime and island environmental resources of Vietnam. For secondary and high schools, they focus on providing students with concepts and terms related to sovereignty over seas and islands such as: Baselines, internal water, territorial water, Contiguous Zone, exclusive economic zone, continental shelf, documents affirming Vietnam's sovereignty over seas and islands, as well as introduction to the geographical location, natural conditions of

seas and islands, education on maritime resources and environment, response to climate change, prevention and mitigation of natural disasters, the development of maritime economic sectors and occupations, etc. In particular, in the high school level, the schools also educate students on content related to the Vietnam's Law on the Sea, the Party and the State's views on sea and islands sovereignty and the protection of Vietnam's sovereignty on sea and islands (Hue, 2023).

During the teaching process, in addition to applying traditional teaching methods, teachers also use vivid visual methods through the use of PowerPoint, showing students videos to awaken their love sea and islands. In addition to the official school hours, the schools also coordinates with the local departments and organizations to organize extracurricular activities, write and drawing competitions on the sea and island.

3.2.2. For vocational education level.

In the coastal areas alone, there are 90 vocational colleges, 133 vocational schools and 454 vocational centres, in which, there are many vocational training in maritime economics. Typical maritime and island vocational education institutions include: Agriculture and Fisheries Intermediate School, Phu Quoc Vietnam-Korea Vocational School, Maritime College No.1, Waterway Transport College No.1, Haiphong polytechnical College, Nam Bo Agriculture College, Can Tho Technical Economic College, Soc Trang Vocational College, Central Transport College No.3, Ho Chi Minh City College of Economics, etc.

The disciplines, occupations related to the sea, islands are taught in these training institutions are: Fishing vessel sailor, Sea Captain/ Navigation, Ship machine operation/ Maritime engineering, Ship electricity, vessel machines Repairing, Shell manufacturing technology Shipbuilding, Hydraulic Structure Construction, Logistics, fishing seafood Exploitation, Aquaculture, Prevention and treatment of fisheries; Operation of petrochemical equipment;...

Depending on the type of training, the training duration is different: Primary level (3-6 months); Intermediate level (1.5-2 years); College level (2.5-3 years). In addition to vocational education, there are other forms of vocational training: i) Training and examination to grant captain's and chief engineer's degrees of all classes; ii) Training courses in Basic, Specialized, Special knowledge, Fostered Professional knowledge (including: Deck management officer; Ship engine management officer; Ship electrical engineering officer; ...); iii) Short-term supplementary chief engineer class I, II, III.

According to Decision No. 1769/QĐ-LĐTBXH issued on November 25, 2019 of the Ministry of Labour - Invalids and Social Affairs of Vietnam on the approval of key training occupations and Vocational education and training institutes permitted to select key training occupations for the period 2016-2020 with vision to 2025, out of 16 key groups of occupations, there are 04 sectors with 11 occupations related to the sea, 9 occupations have trained at the international level, 3 occupations at the regional level, 8 occupations at the national level.

In addition, the Ministry of Labour - Invalids and Social Affairs of Vietnam in collaboration with the Department of Agri-

culture and Rural Development, has developed and implemented two vocational training programmes and one programme to improve captains and fourth-class Chief engineer's skills for coastal fishermen. The localities also deployed and multiplied vocational training models through the organization of pilot training of chief engineer and fourth-class captains in 16/28 coastal localities with a total of 25,000 fishermen (30% number of the fishing needs to be trained) (Vietnam News Agency, 2018).

3.2.3. For the university education level.

According to the Ministry of Education and Training of Vietnam, by the end of 2020, there are 237 universities in the country. The number of full-time lecturers are 73,132 people, including 542 professors, 4323 associate professors, 21977 Doctors, 44119 Masters, 6543 university bachelors. There are 20 maritime-related specialties training majors, 92 training establishments with 20 maritime-related specialties training majors at the university, master, and doctoral degrees. Typical training institutions on sea and islands include: University of Law – Vietnam National University, Ha Noi; Hanoi Law University; Ho Chi Minh City Law University; Diplomatic Academy of Vietnam; Vietnam Maritime University; Hanoi University of Natural Resources & Environment; Vietnamese National University of Agriculture; Ho Chi Minh City University of Agriculture and Forestry; Vietnam National University-Hanoi University of Science; Military Technical Academy; Hanoi University of Mining and Geology; Foreign Trade University; Hai Phong University of Medicine and Pharmacy; Hanoi Medical University; Hanoi National University of Education; Vietnam Naval Academy; etc.

The sea and islands majors /specializations are trained at the university level including: International Commercial Law, International Law, Maritime Law and Management, Maritime Law and Policy, Maritime Management, Oceanology, Meteorology, Maritime Hydrology, Maritime Environmental Resources, Maritime Economy, Maritime Trade, Ship engine operation, Maritime Machinery, Maritime Science and Technology, Maritime Engineering, Shipbuilding and Offshore Construction, Naval Architecture and Maritime Engineering, Aquaculture, Aquatic Product Processing, Seafood exploitation, Aquatic Pathobiology, Officers, Seafarers, Customs, Maritime Medicine, Education,...

3.3. Inadequacies and challenges in Vietnam's maritime human resources training.

In addition to the results achieved as mentioned above, Vietnam's maritime human resources training has been facing the following challenges and shortcomings:

Firstly, although maritime human resources are considered being "the breakthrough factor" of Vietnam's maritime strategies, in Resolution No. 09-NQ/TW dated January 9, 2007 and Resolution No. 36-NQ/TW dated October 22, 2018, the contents relating to maritime resources are rather blurred, unclear, specific. Besides, up to now, Vietnam has not had separate strategy or unified regulations, harmonizing the issue of training and

using of maritime resources. The current maritime human resources training is mainly implemented in a minor way without a comprehensive strategy.

Secondly, the sea and islands state management apparatus in general and the Education State management state management apparatus (including education on sea and islands) in particular have many shortcomings, typically: *i)* Vietnam has not established a unified state regulatory body for the seas, islands, while the sea and islands are a interdisciplinary, inter-national and inter-international. The human resources responsible for the integrated state management of the island seas in the coastal provinces are weak and lacking. Many officers have not been trained in the maritime field (Japan International Cooperation Agency, 2023). *ii)* The state management apparatus for education in general and education for the sea and islands in particular is still dispersed.

Thirdly, the maritime human resources training is primarily spontaneous, passed down from father to son, predecessors pass on experience to successors. There is no connection between the training facility and the need of the region and the society. Massive enrollment, in-service training, transfer training, upgrading degrees from elementary to intermediate, college to university are common. Although many students and trainees are trained in sea and island majors, they don't have the opportunity to contribute due to inadequacies and negative of recruitment work at many agencies and organizations, causing a situation of "wastefulness" human resource and "brain drain".

The evidence is that the School of Law (now University of Law), Vietnam National University Hanoi has trained 13 Masters, but currently only one Master works in the field of sea and islands, the rest is outside disciplinary.

Fourthly, the number and distribution of training facilities, centres/instituts for sea and islands research are still limited, don't meet the requirements of the actual situation. The maritime human resources training has mainly only been implemented in the form of a single academic academic disciplin or majior with a small scale, focusing on legal fields, aquaculture, seafood exploitation, Aquatic Product Processing, Aquatic Pathobiology, oceanography, maritime engineering, etc. There is no separate program on maritime environment, maritime ecosystem, maritime science and technology, and maritime health (Van & Thuy, 2017). The distribution of educational, training and research institutions on the sea and islands is not reasonable. Most of these institutions are concentrated in the Northern and Southern of Vietnam. There are very few training facilities in the Central Vietnam, whereas there are many large maritime ports, with great potential in providing human resources for the maritime industry.

Fifthly, the curriculum, training content on the sea and islands at all educational levels are not really science, lack of connectivity, unity.

At the preschool education level: There is no compulsory education program of the state on the sea and islands issues. Sea and islands educational content is mainly created by schools and teachers, after that incorporated into lessons, such as storytelling, singing, painting, or experiential activities. That leads

to an imbalance in teaching efficiency in each school.

At the general education level: Although regulation on integrating sea and islands contents into the general education program at all levels have issued since 2011-2012 academic year, the actual implementation has not yet been effective because there is no official subject on the sea and island. The educational content on the sea, islands is mainly integrated into the curriculum of some subjects or after-school classes with limited duration. The educational content on the sea and islands, especially Vietnam's sovereignty over Parcel and Spratly islands at all academic levels is still not unified, seamless, unclearly, ineffective, incorrect, without clear career orientation, not really effective in remote areas and island districts.

At the vocational training and university education level: The training programmes of the sea and island academic disciplines have faced with many d inadequacies due to the lack of unification, unclearly separation between training skills and knowledge and coaching skill and knowledge, not adhering to the real situation, lack of strategic nature. The training contents are mainly theoretical (about 70% of the curriculum, of which more than 40% are general, basic, foundation subjects). The number of specialized subjects and vocational practical subjects only accounted for a very small proportion of the training programmes. Moreover, the duration of these practical subjects is also very short, on average only one-third to one-twoth of the studing time of the relevant theoretical subject. For example: Survey Result in Vietnam Maritime University – one of Vietnam's leading maritime human resources training institutions, has shown that only 22/53 subjects with 69/123 credits in the maritime-related training program. The internship time in this field is only 4/123 credits. Besides, training on safety, maritime security as well as ethics issues have not been focused. Through a survey of about 100 sea and islands training institutions, the author found that there were a number of schools training on this issue with limited capacity and duration (average from 1-3 credits per subject).

Seafaring is a lucrative profession but must be trained rigorously (Angelica et al, 2011). However, many training institutions have truncated and shortened the training program, causing the teaching don't guarantee duration and knowledge in fact. Competition between training institutions and negativity in exams have caused decrease of maritime human resources quality (Traffic Newspaper, 2022). Education and training of human resources on sea and island dispute settlements has been given much attention.

Sixthly, the staff involved in maritime human resources training is inadequate in quantity and in some cases weak in quality, professional qualifications and political attitudes, slow innovation, unregularly updated knowledge transmission and innovation of teaching methods, and weak foreign languages. Most of Lecturers is plurality for teaching. In spite of having a lot of practical experience, they are limited in pedagogical methods and professional qualifications (Vietnam Maritime University, 2023). Many lecturers graduate bachelor's degree, so they lack practical experience in sea and island, and don't stimulate the learners' potential (Sang, 2020).

Seventhly, the facilities and equipment for mrine human re-

source education and training are weak and lacking, especially traineeships, laboratory and experiment equipment, and specialized classrooms according to the regulations of the International Maritime Organization. The library at some training institutions didn't meet the student's academic needs due to the limited number of specialized books and foreign documents.

Eighthly, the remuneration and salary regim is not commensurate with the qualifications, capacity, and dedication of the human resources. Besides, wage reform policies are delayed, lack of flexibility (Sang, 2020).

Ninthly, scientific research serving the education and training of maritime human resources has not been properly invested. Every year, the total budget for scientific research generally accounts about 2%. There are no specialized research centres/institutions for sea and islands education and training.

Tenthly, the human resources involved in maritime education and training of Vietnam are lacking in quantity (especially leading experts and creative research team), weak in quality. The human resource structure is still unbalanced between central and local, between sectors and between regions, lack of next generation team, weak in professional competencies and foreign languages skills, low productivity, not enough to compete with countries in the region and around the world (DeZan Shira & Associate, 2016). According to the Asian Productivity Organization (APO), Vietnam's labor productivity is 26 times lower than Singapore's, 7 times lower than Malaysia, 4 times lower than of China, 3 times lower than Thailand's and 2 times lower than Philippines (Ha, 2022). Because a lot of well-trained workers with intermediate degrees or higher are not interested in going to sea (Leo Camparal et al, 2017). They choose other jobs on the shore to choose other jobs on shore for less hardship and higher income. Most of the captains and chief engineer officers in Vietnam today have little formal training and lack basic knowledge to be able to use maritime equipment; lack of knowledge about Maritime Law to be able to operate in international waters.

Eleventhly, the demand for studying maritime specialization majior has been decreased slightly recently. Because the maritime environment is an extremely harsh environment, workers have to keep away from home for long periods of time, facing many risks from natural disasters and man-made disasters; regularly have to participate in professional certification training courses, capacity-enhancing courses, while taking a long period of internship on the ship (about 36 months) to be able to take the rank promotion exam.

Twelfthly, training and fostering work to improve professional qualifications, political bravery are not substantial, not profound, therefore, some lecturers and teachers have degenerated, violated discipline and legal regulations must be criminally prosecuted, even having the heads of educational and training institutions. The massive handling of the high-level officers in the Coast Guard Command in 2021, the handling of 78 higher education institutions with violations regarding enrollment in 2022 or the prosecution of the former chairman of the board of members and key members of the Vietnam Education Publishing House in 2023 have somewhat demonstrated this situation.

Thirteenthly, maritime human resources training in Vietnam is currently facing many challenges arising from the impact of the Industrial Revolution 4.0, especially the development and application of virtual reality, artificial intelligence, transdisciplinary/trans-major education programmes; the personalization of learning; artificial intelligence applications, data search on big data warehouses, etc.

Fourteenthly, the trend of international cooperation, globalization in the field of education is also creating many challenges for maritime human resources education and training of Vietnam. The opening up of Vietnam's higher education market has become more transparent, attracting the participation of many educational institutions, foreign universities, creating greater, fiercer competition not only in terms of tuition fee but, more importantly by the quality of the training services provided (Dien, 2023).

3.4. Countermeasures for Vietnam.

Education and training play an important role in the nations' development. South African President Nelson Mandela - Nobel Peace Prize winner, also emphasized the fundamental role of education and training in the national development. "Education is the most powerful weapon which you can use to change the world. To destroy any nation that doesn't need to use nuclear bombs or long-range missiles, just lower the quality of education and allow students to cheat on exams" (Mandela, 1994). Therefore, Vietnam needs to pay special attention to education, training of maritime human resources, considering it to be a "foremost national policy". Faced with the challenges and shortcomings that have been posed to the education and training of maritime human resources in Vietnam, the following solutions need to be implemented as a priority:

Firstly, raising the awareness of the entire Party, the entire army and the entire people about the position, the role of the sea and island as well as the education and training on these issues for the construction, development and protection Vietnam. Everyone need to be vigilance against all plots and activities of hostile forces.

Secondly, improving the state management apparatus of the sea and island from central to the local degrees, and at the same time building a team of highly qualified, highly skilled and strong political bravery officials as the basis for implementing effectively, consistently the solutions for training, cultivating, using and developing of the maritime human resources in practice.

Thirdly, focusing on reviewing, improving the policy and laws' system on the sea, having a mechanisms to support and improve training quality, developing a network of maritime human resources training institutions reaching advanced levels in the region, building high-quality maritime human resources meeting market demands; diversifying the training and expanding the maritime majors; having talent remuneration and attracting regime, gradually forming a team of managers, scientists, experts on international qualifications, with deep expertise in the sea and the ocean.

Fourthly, emphasizing and promoting statistical work and scientific forecasting of maritime human resources needs.

Fifthly, urgent formulation and promulgation a comprehensive strategy or project for the training, fostering, using and developing of Vietnam's high-quality maritime human resources for the period 2025-2030, vision 2045 with specific contents and roadmaps.

Sixthly, rapidly improving the education system in the direction of openness, integration, promotion of stratification, reorganization of education systems, especially higher and vocational education. At the same time, correctly identify the capabilities and training needs of the enterprises and localities in order to regulate the scale, industry and occupations structure, and training levels accordingly.

Seventhly, promoting education, training and development of maritime human resources on the basis of diversifying training methods, clearly defining training standards and organizing training for each appropriate professions. Enhancing education, awareness, knowledge, understanding of the sea, the ocean, survival skills, climate change adaptation, Sea-level rise, disaster prevention and avoidance, English skills for students in all levels of education. Focusing on training in new disciplines such as maritime synthesis management, Physicochemical technology in freshwater extraction from the sea, renewable maritime energy exploiting technology. Quickly select and implement training based on international standards, balancing training rates by level and profession. Strengthening business partnerships businesses and universities, vocational schools, ensuring the harmonization of supply to the maritime labour markets.

Eighthly, actively innovating the teaching methods of maritime issues, transition from knowledge-based training to competency-based training, updating exigency, competency certification (Ziarati, 2006). Besides, the education and training institutions need to actively coordinate with local agencies, departments and unions to organize activities that contribute to educating, propagating and spreading the love of the sea and islands.

Ninthly, grasping thoroughly more deeply and fully the Party's guiding ideology on effectively constructing and implementing the overall project on "fundamental and comprehensive education innovation" according to the orientation of "standardization, modernization, socialization, democratization and international integration."

Tenthly, modernizing and changing the education, training methods, especially higher education, vocational education; associating training with scientific research and technological application; promulgating outstanding policy to attract and utilize talent; supporting international publication.

Eleventhly, tightening the selection and utilize the staff working in maritime teaching, especially the lectures. This human resources is required to be constantly updated improve their knowledge, expertise in accordance with domestic needs and international standards.

Twelfthly, strengthening investment in facilities, researching and teaching equipments, for maine human resource researching and training institutions; enhancing and expanding foreign relations, international cooperations; taking full advantage of resources and international support to improve mar-

itime management and exploitation capacity as well as training and developing high-quality maritime human resource (Binh, 2019). In the immediate future, Vietnam could consider cooperating with the European Union through the implementation of projects such as Safe at Sea (SOS), E-CMDSS and GMDSS VET (GMDSS online learning); Maritime Tests of English Language (MarTEL); European Boat Design Innovation Group (EBDIG); Sail Ahead (creating opportunities for seafarers to find jobs on shore), etc.

Conclusions.

Vietnam is a coastal country with people's lives linked to the sea for many generations, so the sea and islands play a particularly important role in establishing, developing and protecting the country.

Maritime human resources training is not only one of the five perspectives, five goals, five major goals, but also one of three breakthroughs, and one of seven major solutions of the Viet Nam's maritime economy by 2030, with vision towards 2045. Therefore, Vietnam needs to continue to thoroughly grasp education and training in general and maritime education and training in particular is "foremost national policy"; investing in education is the most profitable investment, bringing the longest results. Especially in the current trend of moving towards the sea, maritime domination, international integration as well as the challenges of the 4.0 revolution, the rising of China's unreasonable claims and actions and the Fierce strategic competition between major powers countries in the East Sea, the issue of maritime human resources education and training requires even more urgent attention and concern.

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