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Curriculum interdependence in the preparation of the engineering and economic and financial technique of the future commercial marine officers

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Abstract. The education and training of the future merchant marine officers have reached a high-quality international level, recognized both by the beneficiaries and by the bodies of evaluation of the activity of the institutions of higher education of the navy. The training of merchant marine officers involves knowledge and skills in the technical field and other complementary fields. The current challenges related to safety, security and economic efficiency lead to the consolidation of the level of education and training of merchant marine officers, through the interdependence and diversification of the curricula in the world economy of shipping, finance of the maritime industry and the specialized labour market.

Keywords. merchant marine officer, economic and financial curricula

1. Introduction

Maritime transport has an essential role to play in the movement of goods, both quantitatively and operationally, a role conferred by aspects such as relatively low costs, concerning the large volume of goods that can be transported; the complex and diversified character of trade; increasing the number of participants in these exchanges.

The three essential elements underlying the definition of maritime transport are the following: goods, characterized by a high volume and a high value; ships, as a means of transport incorporating a high level of technicality and investment; ports, as transshipment hubs, as well as operating facilities within them, to which are added the crews, which require a high level of professional training, both technical and economic.

The commercial ship represents an economic unit destined for freight and / or persons. The transport is carried out based on a contract, of different forms and clauses, depending on numerous factors: type of goods, economic, political conditions, geographical area, transport relations, etc. Thus, the conditions and clauses in which a certain transport is carried out are not identical to those of the others, a voyage does not resemble the previous ones, even if it is carried out by the same ship.

The importance of maritime transport has led to the development of broad international cooperation, under the aegis of the United Nations, to ensure: the safety of human life and ships at sea; avoiding accidents and organizing maritime assistance and rescue; preventing pollution of the environment in general and the marine environment in

particular; unification of legislation and methodology in maritime transport; insurance of goods, ships and persons; the protection of shipowners and owners of goods; establishing, for maritime trade, an adequate legal, economic, equitable, sustainable and operational framework, based on international cooperation, guaranteeing its functionality, equality in rights and obligations of partners, conditions in which the principle of mutual advantage can ensure a fair return within the international community.

Thus, it can be stated that maritime transport is a very complex economic activity, having a national and international character, which must be thought and carried out both according to needs and to ensure profitability.

The main function of maritime transport is to ensure the connection between production and consumption and is characterized by two essential features, of economic nature: economic efficiency, in the sense of satisfying defined requirements; profitability, as an essential condition of a broad economic activity, which involves costs of the transport itself and costs of the related operations.

Currently, world trade is around 90% by the international shipping industry. Without international shipping, importing and exporting the necessary goods to the modern world would not be possible. Sea trade, with its ups and downs, continues to grow, bringing benefits to consumers around the world through its competitive freight costs. As a consequence of the increasing efficiency of maritime transport, the degree of economic liberalization has also increased, and the prospect of growth, after the recent global crisis (which has not yet been exhausted), continues to manifest itself, as a result of the growing trend of the world economy.

Today there are over 90.000 operational commercial vessels, which carry all kinds of goods by sea. The world fleet is registered in over 150 countries and comprises over one million sailors, from almost all countries of the world.

Maritime transport is considered the safest and least aggressive environment. It is appreciated that, almost uniquely, among industries that involve physical risk, the safety of all operations in maritime transport is very well implemented. Shipping was among the first industries that adopted safety standards recognized at international level and widely implemented.

2. Data and methods

The analysis of the current situation and the evolution of the labour market in the maritime field starts from the global economic situation mirrored in the situation and the evolution of the maritime trade. The sources used are the reports and statistics of the UNO and UNCTAD, as well as the specialized publications, among which we mention Review of Maritime Transport.

The evolution of world maritime trade in recent years has been directly influenced by the evolution of the world economy and therefore a synthetic analysis of the latter is required. For analysis, we chose three groups of countries: developed, in transition and developing and China compared to the evolution of the world economy.

Today, the merchant maritime ship is a floating plant that requires qualified personnel, with a high professional and ethical level. The complexity of the ships, the diversification of the types of ships and cargo, the special increase of the number of ships have imposed firm and clear rules regarding the selection, preparation, hiring, promotion and control of the training of the navigating personnel.

Knowing the laws that govern the international market for seafaring personnel is of crucial importance for those who make the personnel policy at the international, national and company level.

The approach of the international market for seafarers is strictly related to the safety of navigation and the protection of the marine environment.

International shipping is mainly regulated by the International Maritime Organization, based in London, a United Nations agency responsible for the safety of life at sea and the protection of the marine environment. The International Labour Organization - ILO is also responsible for developing the labour standards applicable to seafarers worldwide.

IMO has adopted a comprehensive framework of detailed technical regulations, in the form of international conventions governing ship safety and the protection of the marine environment. National governments, IMO components, are required to implement and enforce these international standards and to ensure that vessels registered under their flag comply with these rules.

3. Results

Today the share of world trade at sea is over 90% and provides over 1.5 million jobs for seafarers (seafarer: any person employed and doing work aboard a ship to which the provisions of the 2006 MLC Convention apply. The 2006 Convention MLC does not apply to vessels that sail exclusively in inland and port waters or which are not engaged in ordinary trade, fishing, recreational, military and auxiliary vessels. Thus, shipping is a truly international industry: in today's global market there are ships of a certain nationality, registered in other countries, than the one of origin, with officers and mixed crews from different other countries of the world.

Worldwide, the number of seafarers serving commercial vessels engaged in international voyages are estimated at 466.000 officers and 721.000 unpowered personnel, with a total of 1.187.000 seafarers, plus personnel serving coastal and technical vessels.

The distribution of navigators by geographical regions is presented as follows (table. 1, according to BIMCO 2010, graph 1 and 2):

Table 1

The region	Number and percentage			
	Officers (out of 1,000)	%	Crew (out of 1,000)	%
OECD	184	29.4	143	19.2
Eastern Europe	127	20.3	109	14.6
Africa / Latin America	50	8.0	112	15.0
The Far East	184	29.5	275	36.7
India	80	12.8	108	14.5
Total countries	624	100%	747	100%

Graph 1 %/1.000 officers by regions

Graph 2 %/1.000 ratings by regions

Approximate 21% of the global market for seafarers is provided by seafarers from the EU. Marine education is carried out at the university level. Russia, Ukraine, Bulgaria, Romania and Croatia are included in this group of countries, with Russia having the highest number of navigators. However, Croatia has the highest percentage of navigators in relation to the population of the country (table 2).

Table 2.

Nr.crt.	The country	Population (mil.)	Total browsers (%)
1	Croatia	4,3	0,47
2	Bulgaria	7,3	0,45
3	Romania	19,9	0,12
4	Ukraine	45,5	0,084

5	Russia	143,5	0,045
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The figures available for the European Union show a number of 143.967 officers and 110.152 unpatented, with a total of 254.119 navigators.

The merchant marine officers are qualified to the standards of competence required by the STCW Convention (International Convention on Standards for the Preparation, Certification and Performance of the Cart Service). It is worth mentioning that all qualifications in the maritime field (bridge, mechanical and electrical) are internationally recognized.

Bridge officers must undergo one year of training at sea (6 months - for mechanical officers) in addition to their basic education. Depending on the country, the training of commercial naval officers takes between 3 and 4 years - including onboard training periods, which may take place at the end of a course or at intervals between basic courses.

Following the research conducted for the documentation, it turned out that information on the number of students from maritime universities or naval academies in the European Union participating in the certification courses of the STCW Convention is not systematically available in each country. The number of students in practice aboard national ships is rarely mentioned in documents, although this information is of great importance in assessing the future availability of officers and non-patent personnel.

The European Maritime Safety Agency (EMSA) has developed a database to collect certificates issued each year by the Member States for seafarers within the European Union and equivalence of documents for those outside the European Union.

The labour market in the maritime field is situated in the middle of this connectivity of the maritime domain, because human resources are available globally, through a network of ship management companies with transnational subsidiaries and portfolios; flows of opinion, knowledge, information strategies and human resources are an aid for connecting the workforce, companies and institutions. The labour market has access to information about employers and employees, as employers know the prevailing resources and work practices in the industry; under such conditions of an interconnected world, a single labour market for seafarers is assumed to exist and works - a situation where both labour and employers are competing freely for jobs and workers.

Companies can hire navigators from all over the world with fewer obstacles and operate in a free market environment that seeks the highest return on their investments. The workforce is also relatively free to look for jobs globally.

The reduction of restrictions allowed the employment of seafarers from countries other than those of the origin of the vessels. This has made it easier to hire seafarers outside national fleets. Therefore, the development of a market has brought the employability for seafarers to a global level by organizing a dynamic system of international crewing companies.

The idea of the global labour market in the maritime field as a problem-free space must be recognized as a combination of certain aspects of globalization, with an emphasis on neo-liberal policies on the global labour market.

The global system of recruitment and employment is an essential part of the global labour market in the maritime field. The crewing agencies, either as subsidiaries of shipping companies or as independent entities, have the main responsibility for selecting and recruiting the navigating personnel. The 2006 MLC Convention sets the minimum global standards for the recruitment and placement of seafarers, in Regulation 1.4. The purpose of this regulation

is to ensure that navigators have access to an efficient and well-regulated system of recruitment and placement.

Reports show a deficit of 15.000 officers on the world market. This is why the efforts and achievements of the Romanian marine higher education institutions to develop their connections with the crewing agencies in the country and with the big shipping companies of the world must be appreciated.

Table 3. Number of existing browsers worldwide

	2005	2010	% compared to the previous period	2015	% compared to the previous period	Forecast 2020
officers	466,000	624,000	25.3%	774,000	19.3%	923,382
sailors	721,000	747,000	3.5%	873,000	14.4%	998,712
total	1.187.000	1.371.100	13.4%	1.647.500	16.75%	

Note. The forecast is calculated based on the analysis of the percentage increase of the values presented in table 3 and the premise that the calculated trend will remain the same during the period 2015-2020, although there are still no credible bibliographic sources in this regard.

Graph 3. Estimated evolution of the number of navigators, 2005-2020

4. Conclusions

1. Today, the global seaborne trade, number 1 in international transportation, needs highly trained navigational personnel, more than in the past.

2. Besides their basic technical training, the future merchant marine officers need economic, financial, legal and linguistic training, to ensure the management of the ship, and the shipping company, at a higher level.

3. The study undertaken by this paper confirms the global trend of increasing the number of merchant marine officers and rating, although the official data are not updated.

4. The higher maritime education institutions must adapt o new curricula to the needs of highly qualified personnel in the international shipping, and the training requirements given by the dynamics of international naval transport.

5. A special problem in the curricula of the merchant officers, but which is not yet fully solved, is that of communication in English, the international language of seamen, which requires the large-scale extension in all the marine schools the courses in English.⁶⁵ Another issue that must be considered in the merchant marine curricula is that of the multinational crews, predominantly at the international level. It is necessary that until from the time of school, the future merchant officers must know the history, culture, tradition and psychology of the crewmates of other nationalities.

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