

Received: 29.04.2022
Accepted: 09.10.2022
Published Online: 29.10.2023
DOI: 10.18613/deudfd.1108615

Dokuz Eylül University
Maritime Faculty Journal
Special Issue 2023 pp:1-19
E-ISSN: 2458-9942

Research Article

INNOVATIVE PORT AND LOGISTICS CURRICULUM TO MEET STAKEHOLDERS' FUTURE EXPECTATIONS

Pınar ÖZDEMİR¹
Taner ALBAYRAK²
Alaettin SEVİM³

ABSTRACT

This paper discusses reflections on the recent developments in the maritime sector and the expectations of the stakeholders on maritime education and training in terms of logistics curriculum. The study is based on the survey results that were obtained within the framework of the MINE-EMI Project, which aims to create an international graduate program for maritime universities. The survey in the project was responded to by 225 stakeholders from 5 countries. Its results showed that the courses in the new module should mainly focus on more efficient and fast cargo handling systems, effective use of technology in port management, multimodal transport regulations and updating port facilities. Modification of the curriculum by taking the needs and expectations of the sector into consideration will not only enable the institutions to give a more effective education to help the graduates meet the challenges of the future but also equip them with a curriculum for sustainable development in the maritime sector.*

Keywords: *Maritime Education and Training (MET), Logistics, Port Management, Curriculum, Future Maritime Trends*

¹ Asst. Prof., Piri Reis University, Maritime Higher Vocational School, pozdemir@pirireis.edu.tr, Orcid no: 0000-0001-9878-8139

² Prof. Dr., Piri Reis University, Maritime Faculty, talbayrak@pirireis.edu.tr
Orcid no: 0000-0002-4743-9235

³ Lect., Piri Reis University, alaettinsevim@yahoo.com, Orcid no: 0000-0001-6082-3250

DENİZCİLİKTE GELECEĞİN BEKLENTİLERİNE YÖNELİK LOJİSTİK VE LİMAN YÖNETİMİ MÜFREDATI

ÖZ

Bu makalede, denizcilik sektöründeki son gelişmelerin lojistik müfredatına nasıl yansımaları gerektiği sektördeki tüm paydaşların görüşleri yardımıyla ele alınarak değerlendirilmiştir. Çalışma MINE-EMI Projesi kapsamında yapılan bir ankette elde edilen verilere dayanmaktadır. MINE-EMI Projesi, denizcilik sektöründe sürdürülebilirliği sağlamak, gündemdeki denizcilik meseleleriyle ilgili farkındalığı arttırmak amacıyla beceri ve yetkinliklerin geliştirilmesine odaklanmış bir projedir. Proje kapsamında Denizcilik Üniversiteleri için biri "Liman İşletmeciliği ve Lojistik" olmak üzere üç daldan oluşan ortak bir yüksek lisans programı oluşturulması hedeflenmektedir. Modüllerde yer alacak derslerin müfredatları sektörün gelecekteki beklentilerini ve ihtiyaçlarını karşılayacak şekilde belirlenmeye çalışılmaktadır. Müfredatta yer alması gereken konuları belirlemek amacıyla yapılan ankete proje ortağı 5 ülkeden toplam 225 paydaş katılmıştır. Anket sonuçları Liman İşletmeciliği ve Lojistik dalında yer alması planlanan derslerin daha verimli ve hızlı kargo elleçleme sistemlerine, liman yönetiminde teknolojinin etkin kullanımına, çok modlu taşımacılık düzenlemelerine ve liman tesislerinin güncellenmesine odaklanması gerektiğini göstermiştir. Müfredatın sektörün ihtiyaç ve beklentileri doğrultusunda düzenlenmesi, eğitim öğretim kurumlarının daha etkin eğitim vermelerini sağlamakla kalmayacak, aynı zamanda denizcilikte sürdürülebilir kalkınmanın gerçekleştirilmesi için de önemli bir rol oynayacaktır.*

Anahtar Kelimeler: *Denizcilikte Eğitim ve Öğretim, Lojistik, Liman Yönetimi, Müfredat, Denizcilik Sektöründe Gelecekteki Eğilimler*

1. INTRODUCTION

As the world is becoming a global village, the need for fast transportation of goods is increasing in line with the role of maritime shipping in it. Today, global trade is mainly realized by ocean shipping because approximately 90% of traded goods are transported by sea (OECD, 2019). Thanks to maritime transport, goods that can provide growth and sustainable development in various fields, such as technology equipment or those that are vital for health, such as food and medicine, can easily be transported to all parts of the world (BitNautic, 2020), even during hard

times like the pandemic. That makes maritime transport a very basic and important part of world trade while also increasing competition among its partners. Safe, environmentally friendly, and cost-efficient shipping is dependent on the just-in-time arrival and departure of ships to ports, as well as on fluent port operations.

Like other sectors, the maritime sector is developing too, in parallel with the developments in the world, while countries and companies are trying to keep up with the ever-increasing demands from different stakeholders. In order to compete effectively and strengthen their position in the sector, companies try to be open to developments in all areas, closely follow current developments with their reflections in different fields, try to keep up with them and meet all internal and external demands efficiently. In such an environment and under these conditions, the qualifications of the people who will take these steps are as important as the steps to be taken. For this reason, manning the sector with people who have the knowledge and mindset that can meet the needs of the future should be the first priority. To realize this, that is to train and educate the future employees of the sector in the light of the developments and future expectations, it is necessary to review and renew the existing curriculum of the programs in schools.

In this study, the developments calling for changes in the sector in general and ports and logistics, in particular, are determined through a survey. Then the contents of an innovative port and logistics curriculum to meet stakeholders' future expectations are discussed. It is expected that the study will be beneficial both in terms of curriculum development and in terms of predetermining and evaluating changes and developments in the port and logistics area and taking measures to eliminate problems.

2. LITERATURE REVIEW

All activities concerning logistics and ports, which are the vital links of the great maritime chain, are being affected considerably by the developments in other parts of the sector. Although they seem to be simple, they require the wheels of a large cog to spin in harmony. Purchasing goods may seem to be a common and simple activity in daily life. However, as Cowen (2014:1) notes, even the smallest purchase requires a chain of activities involving many people, places, and activities. Keeping such an important system up-to-date is the priority of all stakeholders, who have made notable efforts to keep their ports operational and speed up the use

of new technologies. They try to be proactive and ready to meet any demand in the future. As a result, a lot of research has been done to predict what will lose its importance and what will begin to matter in the years to come. According to these, prominent changes and innovations that are expected to affect the future of ports and logistics are mostly related to fast digitalization, which manifests itself in many areas. Digitalization refers to the use of digital technologies to support the existing and innovative provisions and management of freight transport and logistics (Wang and Sarkis, 2021:1). One of them is artificial intelligence, which is being widely used by all parties involved in logistics all over the world. In addition, there is machine learning, 5G (Fifth Generation), blockchain-distributed ledger technology, pervasive computing, data analytics, and immersive technology, which are developing fast and affecting the maritime sector at an unprecedented rate (Wang and Sarkis, 2021:1).

It is certain that digital processes and automation will continue to increase in ports and logistics. The respondents of a survey by McKinsey & Company, which is a trusted advisor and counselor to many of the world's most influential businesses and institutions, expect that automation will rapidly increase in the years to come and almost half of the new ports to be built will be partially or fully automated as per 2017 (Chu et al. 2018). An increase in digitalization will increase the competitiveness of companies, so they will try to adopt to new technologies and new applications as much as possible. The benefits of technological developments are countless in maritime logistics and shipping, which are sure to make use of Big Data and digitalization, especially in areas like efficiency, safety, and energy saving. Thanks to digital technologies, ships will have a shorter waiting time at ports and they will also have to wait less for processing at terminals. Thanks to the wide networking and a large number of interfaces, a suitable ground for digital transformations is provided. However, there are also risks such as data abuse or cybercrime (Fruth and Teuteberg, 2017: 1411066). Cybersecurity is another priority related to digitalization. There is a better connection between ships and ports, and they are both integrated into the networks of information technology. Because of this, the fact that the measures for cybersecurity should be implemented and strengthened with great care is getting more and more important (Review of Maritime Transport, 2020).

The increasing role of the seaports in world trade has made them centres of trade. Ports are established as "transport nodes", which gave way to the rise of the cluster concept in the port industry (Langen and Haezendonck, 2012: 638). According to Rodrigue and Notteboom (2022:4:4), express port clusters, which are geographically concentrated

and interconnected groups of business units focusing on transportation, logistics, trade, and industrial output, have been established. The cluster environment has provided the focal organizations with a unique environment in which network resources can be coupled with the firm's resources that are not shared, potentially resulting in new competitive advantages (Haezendonck and Langenus, 2018: 75). Thus, they have turned into international trade hubs and/or multimodal gateways that connect national economies to global manufacturing networks (Singh et al. 2018: 258).

One of the most important issues related to ports and logistics has been described as the increased sensitivity to the environment. International bodies such as IMO (International Maritime Organization), the UN (United Nations), or the EU (European Union) take precautions to create a more environmentally-friendly sector. More and more measures are being taken to eliminate the harmful effects of sulphur emissions, greenhouse gas emissions, and ship recycling on the environment and climate, and to create a more sustainable future for the next generations (Deloitte, 2020). The number of campaigns, projects, and activities to raise public awareness of environmental issues is increasing day by day.

Ports have a dynamic environment that is easily affected by the changes in technological advancements, political regulations, and social changes that are the natural outcomes of people's interactions with each other. These developments require managers not only to be informed about newly emerging trends but also to have the skills to tackle them diligently. While developments in port and logistics are progressing at an unprecedented pace, the managers are expected to not only balance expectations, demands, and supply but also develop good relations among employees as well as customers. For this reason, there is a need for wise and visionary managers who know the current situation in the port and logistics areas and closely follow all developments.

Gender balance is another factor that plays a big role in today's companies. It is becoming increasingly important in workplaces as a workforce with different demands and expectations, the Millennials, enters the workforce. The soft skills necessary to succeed are different from those which were vital before. These changes will affect leadership and management in all sectors. In this sense, educational institutions assume a major role since they are supposed to train managers to meet the characteristics required by the modern age.

The port industry is subject to many changes in the future. Research conducted by Deloitte, a company providing audit, tax, legal, financial, risk advisory, and consulting services (Deloitte, 2022), identifies

eight individual trends and three following broader trends, driven by demographic, technological, and sustainability drivers that will jointly influence the outlook of the port industry in 2030.

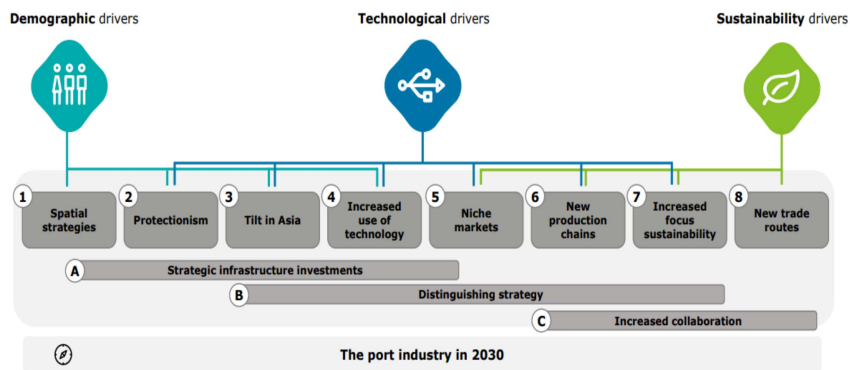


Figure 1: Trends to Influence Port Industry in 2030 (Deloitte, 2020)

As the figure shows, these changes require the companies to have strategic infrastructure investments for spatial strategies, protectionism, the Tilt to Asia initiative by Deloitte, and increased use of technology. They also require them to adopt a distinguishing strategy, especially for niche markets and increased collaboration among stakeholders for new production chains, increased focus on sustainability, and new trade routes.

Ever-increasing changes shaping the world and everything in it require change in supporting systems, one of which is the education system, which should be reviewed and reshaped in line with these changes. Some subjects should be removed from the curriculum, while others should be included in it. Methods, educational aids, and even the examples given in lessons should be renewed in light of the research made to determine the expectations of the stakeholders.

3. METHODOLOGY

The topics that are recommended to be included in the innovative logistics and port curriculum have been determined upon the evaluation of a survey given to the stakeholders in the maritime sector within the frame of the MINE-EMI (Maritime Innovative Network of Education for Emerging Maritime Issues) Project. The project is carried out by 7 partners in 5 countries, which are Piri Reis University (Turkiye), Constanta

Maritime University (Romania), Nikola Vaptsarov Naval Academy (Bulgaria), The University of the Aegean (Greece), Marine Cluster Bulgaria, (Bulgaria), Municipality of Piraeus (Greece) and the Conference of Peripheral Maritime Regions, CPMR (France). It aims to determine emerging issues in maritime so that a master's program can be shaped accordingly. The survey prepared within the frame of the project was sent to the stakeholders in the maritime sector, among whom are chambers of commerce, educational institutions, shipyards, tourism and port companies, student organizations, etc. In order to decide which questions will take place in the survey, faculty members working in partner universities, all of whom are experts in their fields, were asked to create a pool of questions. These questions were then analyzed by a committee consisting of instructors from partner schools, and those worthy of inclusion in the survey were selected. The survey was responded to by 225 stakeholders in 5 different countries. Of the respondents, almost 56% were instructors and students in higher education institutions. The remaining 44% were from different fields in the sector. The survey contained 50 questions on the 5-point Likert Scale.

Previously, similar research for a more proficient program in logistics and supply chain management was conducted by Sun and Song (2018: 129), who say that the program should cover several competency categories together with some skills and calls for flexible teaching methods. They based their study on some previous research, while this study makes use of the data obtained from the MINE-EMI Project survey. Sun and Song (2018: 131) suggest that it is necessary to improve logistics and supply chain education to enhance the talents and competencies of students and close the gap between education and industry.

4. RESULTS AND DISCUSSION

The findings of the MINE-EMI Project survey helped the researchers decide which topics are gaining importance and popularity in the logistics and port fields. It helped the contents of these courses to be redesigned by curriculum developers in a way to include newly emerging topics and omit some outdated ones. That means the benefit of the survey is two-fold. Firstly, it shows the opinions of the stakeholders on what the newly emerging topics in maritime are. Secondly, it helps the curriculum to be designed in line with these tendencies.

As Panayides and Song (2013:302) indicate, the change in the demands of stakeholders in the role of ports and supply and logistics chains caused the evolution of maritime logistics as a discipline. Taking this point

into consideration, port-related statements and logistics-related statements have been grouped and evaluated separately in this study.

4.1. Port-Related Statements

There are 6 port-related statements in the survey. Table 1 shows these statements with their mean and standard deviation values.

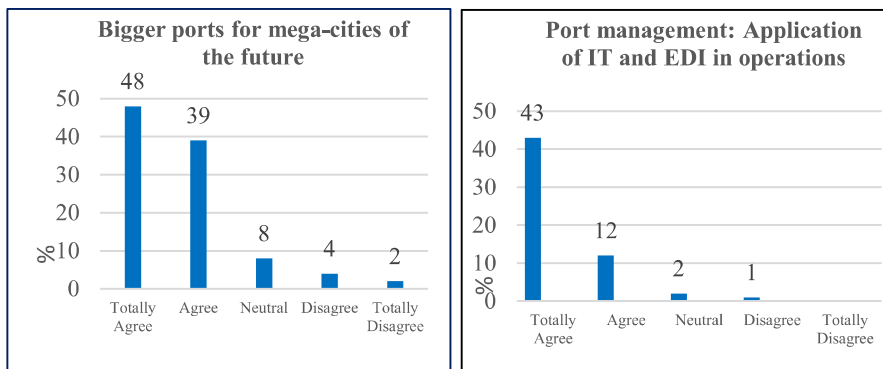
Table 1: Port-Related Statements with Their Mean and Standard Deviation Values

| | N | Mean | Std. Dev. |
|--|----------|-------------|------------------|
| 1 Bigger ports with more efficient and fast cargo handling systems will be needed to satisfy needs of Mega-Cities of future. | 189 | 4,28 | ,868 |
| 2 Port management: Application of IT (Information Technology) and EDI (Electronic Data Interchange) in operations. | 188 | 4,27 | ,757 |
| 3 Competitor analysis: Assessment of competing ports and evaluating their competitive advantage. | 188 | 4,24 | ,808 |
| 4 Port facilities and equipment will be subject to profound technological changes that will require extensive revisions in the respective education programs. | 192 | 4,19 | ,856 |
| 5 Port users as an essential component of port authorities decision making process. | 186 | 4,16 | ,780 |
| 6 Expansion of seaports hinterland. | 188 | 4.07 | ,884 |

Of the 6 port-related items given above, the first one that is about the need for bigger ports for bigger cities in the future is the statement that got the highest support from the respondents. As Figure 2 (a) shows, 87% of them agreed with this idea. That is, they stressed that the megacities of the future will need bigger and more proficient ports to meet the ever-increasing demands of the people. These ports should be equipped with cutting-edge technological devices such as more efficient and fast cargo

handling systems or tools requiring digital technology so that they will be able to meet the demands of a megacity.

The next statement, which the respondents agree with the most, is about the digitalization of port management. They support the idea that both IT and EDI should be used in operations in the management of the ports of the future. The use of IT will provide ports with benefits like reducing manual effort and paper flow, facilitating timely information flow, and enhancing control and quality of service and decisions made. When the supply chain is in question, the fast exchange of information in commercial transactions among enterprises and individuals and the enhancement of growth and profitability across the supply chain are made possible thanks to IT (Kia et al. 2010: 343). On the other hand, using systems like EDI in exchanging business documents, especially purchase orders and invoices in ports, increases the efficiency of supply chain performance and processes at port (MAERSK, 2021). As Figure 2 (b) shows, 55% of the respondents agree with the importance of the application of IT and EDI in operations.



(a)

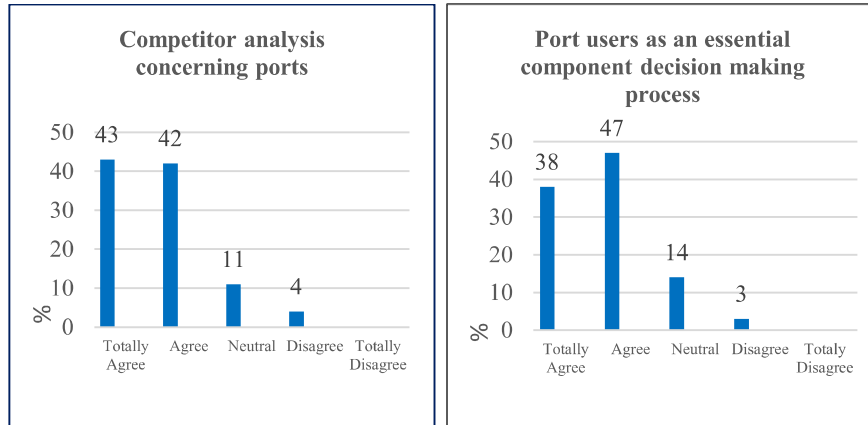
(b)

Figure 2: Responses to the Statements on the Need for Bigger Ports (a) and Increase in Digitalism (b)

Another factor that the stakeholders found significant about the ports is their image, which also affects their competitiveness. 81% of the respondents agreed that port image affects port competitiveness and emphasized that port reputation in the market is important for its reliability. According to the World Bank's Port Reform Tool Kit (The World Bank, 2020), the factors contributing to a port's competitiveness, and thus

improving its image, are its location; an improved inland transportation system; a good legal framework at the national and local levels; good financial resources; a good management climate; and reasonable port cost. Apart from these, factors like advanced technology, the availability of dedicated facilities for container transshipment, and the availability of professional personnel in ports are also effective in providing a competitive advantage to the ports (Tongzon et al. 2007: 478; Ng, 2006: 239). In the 21st century, there has been a change in the factors determining competitive advantage. Today, smart ports that are fully automated and use new technologies have a competitive advantage over others. They are fully digitalized, innovative, and respectful of the environment. Using smart port technology enables them to lower transaction costs, reduce information asymmetry, distribute and use resources more accurately, and improve the productivity of the port (Yap, 2020:198). The importance of competitive advantage is appreciated by the respondents to the survey, as Figure 3 (a) shows that 85% of them agreed that assessment of competing ports and evaluating their competitive advantages are essential for competitive analysis.

As stated above, there is great competition among ports. Rodriguez and Notteboom (2010:22) point out that the factors that contribute to the competition are globalization of production and consumption, the emergence of a global transport network, changes in inter-port relations, port-hinterland relationships, and logistics. To keep pace with the developments in the sector and to meet the fast-changing demands, ports have to be more innovative, consider the demands of the market more, and respond to the demands of the stakeholders more efficiently. If they fully meet the expectations of the port users, include port users in decision-making processes, and strive to create a reliable image in the sector, they will gain a competitive advantage. All these issues were also emphasized by the survey participants, 85% of whom indicated that port users are an essential component of port authorities' decision-making process, as Figure 3 (b) shows.



(a)

(b)

Figure 3: Responses to the Statements about “Competitor Analysis for Ports” (a) and “Port Users in Decision Making Process” (b)

The next point stressed by the respondents is the port’s "hinterland," the area inland from the port where imports are distributed to and exports are collected from efficiently (Woodburn, 2010:22). As Notteboom (2008:38) expresses, the competitive battle among ports will increasingly be fought ashore, which makes hinterland connections key areas for competition and coordination among actors. Its importance has been appreciated by the port administration as well, which also emphasizes the role of innovation and digitalization and focuses on reaching the hinterland with methods brought to life thanks to innovative logistics (Behdani et al. 2020: 3). The survey results are in line with the research as they show that 74% of the stakeholders agree that the hinterland will become increasingly important in logistics.

Item 4 in Table 1 will be discussed later since it calls for the adjustment of the curriculum to the current needs of the sector, which is valid for both port-related and logistics-related issues.

4.2 Logistics-Related Statements

There are 4 logistics-related statements in the survey. Table 2 shows these statements with their mean and standard deviation values.

Table 2: Logistics-related Statements with their Mean and Standard Deviation Values

| | N | Mean | Std. Dev |
|---|-----|------|----------|
| 1 Supply chain integration in the maritime logistics industry is important. | 188 | 4,33 | ,722 |
| 2 Maritime transportation liabilities of forwarders, ship scheduling and automatic handling techniques. | 189 | 4,21 | ,761 |
| 3 Multimodal transport regulations, Liability regulations for multimodal transport. | 188 | 4,18 | ,752 |
| 4 Increasing demand for logistics after the shift of global economic power to Far East is expected to create a growing market for minor service providers. | 189 | 3,98 | ,902 |

Of the logistics-related statements given above, the one which the stakeholders thought to be the most important is supply chain integration in the maritime logistics industry. 87% of the respondents totally agree that this is an important issue. The same issue has been stressed by Cousins and Menguc (2006:616) who point out that such integration is both important and beneficial since it provides cost reduction, delivery quality, and shorter cycle time. In Figure 4 (a), the distribution of the answers given by respondents to this statement can be seen.

These changes will bring new liabilities and responsibilities to the stakeholders as well as benefits. The responses from the participants show they appreciate the fact that liabilities expected from forwarders will increase, and ship scheduling and automatic handling techniques will be developed in the days to come thanks to the development of technology and management systems. In addition, multimodal transport, which is essential to the development of commerce on a global scale, calls for regulations at the international level (Franco, 2016:1). The significance of providing a uniform international legal framework for multimodal transport of goods was emphasized by a report prepared by UNCTAD (United Nations Conference on Trade and Development) (UNCTAD, 2001), too. The responses given by the participants to this item point out the importance of the same issue since 78% of them agree that the issue of multimodal transport regulations and liability regulations for multimodal transport are important and should be handled with care.

The last item in the logistics-related statements of the survey is "Increasing demand for logistics after the shift of global economic power to the Far East is expected to create a growing market for minor service providers." It is a fact that the role of Asia is increasing in the economy and politics (Bajpai, 2012:32; European Union, 2018; Lavenex et al. 2021:462) and Asia's economic growth will change the center of global industry from the North Atlantic to Asia while increasing the importance of Asia in world trade (Andersen and Strutt, 2011:7). As a result, massive growth in the Asia-Pacific region in terms of manufacturing and the related logistics and supply chain activities has given way to an increase in the number of third-party logistics (Sohal and Rahman, 2013: 45). That means a lot of opportunities are created for entrepreneurs who want to set up their own businesses. The responses given to this item show that participants in the survey agree with the outcome of the research since 73% of them responded positively to this item, as Figure 4 (b) shows.

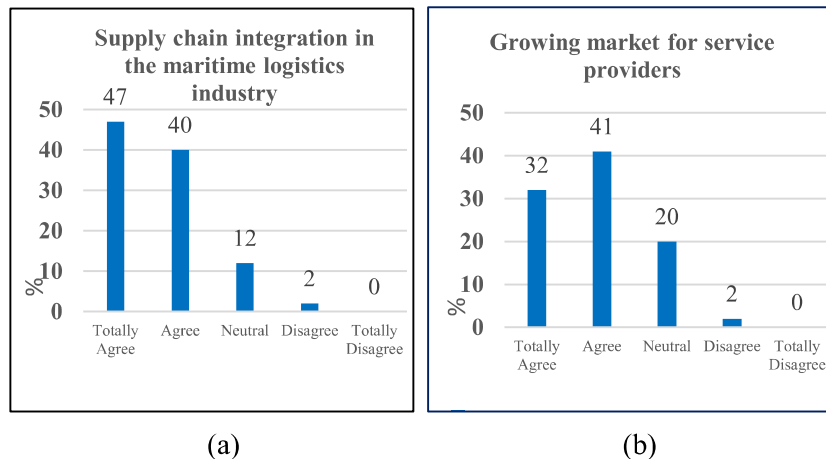


Figure 4: Responses to the Statements about Supply Chain Integration (a) and a Growing Market for Minor Service Providers (b)

The needs and expectations of the programs educating people for the sector are changing because of the effects of technological, political, and economic changes. As a result, the courses and their contents should be reviewed and rearranged on a regular basis to meet the needs. This study revealed the stakeholders are interested in the educational side of the sector since 87 % of the respondents agreed with the statement "Port facilities and equipment will be subject to profound technological changes that will require extensive revisions in the respective education programs." Figure 5 gives the distribution of the responses to this item. The participants'

responses to the items shed light on the content of the new curricula to be created and helped to organize the curricula in line with their views.

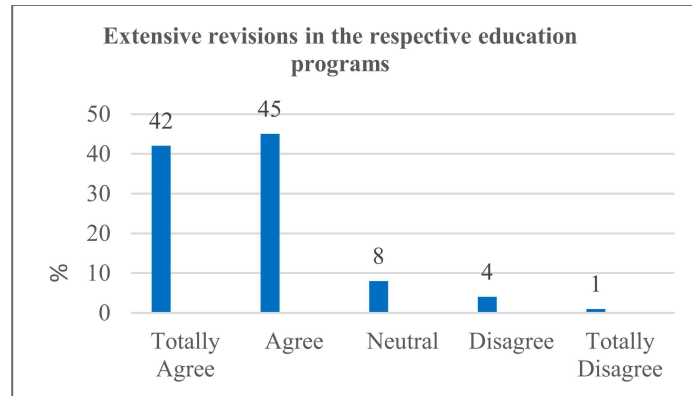


Figure 5: Responses to the Statements about Revisions in the Education Programs

The importance of the maritime sector is increasing and, like all other sectors, the organizations and sub-fields that make up the sector are in constant development and change. This requires the curriculum of the courses in maritime schools to be constantly reviewed and renewed to ensure the students have the necessary qualifications required by these changes. Curriculum development is influenced by a multitude of factors which include but are not limited to philosophical, psychological, societal or social, political, economic, educational, technological, and gender factors (Gulzar, 2021:1). Thus, while designing the courses, factors such as the characteristics of the market or students of a certain region that influence the success of the education programs should be taken into account (Vermunt, 2005: 205). Sun and Song (2018:138) point out that the development of emerging technologies and data processing in business has made logistics and supply chain management an interdisciplinary subject since it requires knowledge from different disciplines. Terms like "Smart Logistics," "Intelligence Logistics," and "Digital Supply Chain" emerged as a result of this requirement. This proves that the changing market focus requires educators to reshape the curriculum and keep it up-to-date so that the gap between the current curriculum and potential talent demand can be closed. As Ozment and Keller (2021:66) suggest, the demand for highly qualified people in logistics and supply chain management is increasing. To meet this demand, all stakeholders concerned should come together to

build programs in logistics and supply chain education. These suggestions justify the main aim of the MINE-EMI project, in the frame of which the survey used in this study was applied.

5. CONCLUSIONS

This research revealed that changes in the port and logistics sector are well appreciated by the stakeholders, and they expect maritime schools to make constant revisions in the port and logistics curriculum to keep the students up-to-date with the requirements of the sector. The data obtained through the questionnaire has been of great benefit in identifying the important issues that will play a role in the future of logistics and port management. It can also be used to determine the new contents of the curricula. Based on the information obtained from the survey, the major developments that the port and logistics industry will experience in the future can be grouped under the following headings:

- More efficient and fast cargo handling systems will be needed in ports.
- Application of IT and EDI in operations will make port management more effective.
- Competition among ports will heat up, so it will be vital for them to have the qualifications that will give them a competitive advantage.
- Port users will be an essential component of the port authorities' decision-making process, which means their opinions should be respected and taken into account.
- Seaports' hinterland will need to be expanded as their importance is increasing and they respond to more and more needs.
- Necessary steps will be taken to realize supply chain integration so that waste can be dramatically reduced in several areas and flexibility can be achieved.
- Keeping maritime transportation liabilities and regulations up-to-date will gain importance.
- The trade in the east will be revived with the shift of the global economic power to the east and the small operators will increase in the maritime sector as in all sectors.

It is the duty of maritime schools to train and educate the students who will shape the future of maritime in line with the needs and demands of the ever-globalizing industry. The students of today, who will be working in the sector tomorrow, are expected not only to master the current situation but also accurately predict what may happen in the future and

adapt to new conditions. The first step in raising employees with these qualifications is to have academic programs that can meet the needs of not only today but also tomorrow. These programs should be prepared bearing all these findings in mind, and necessary changes in line with them should be made in the future.

Ensuring ever-increasing development and sustainability in the education programs will guarantee the success of the students for the future duties in the sector, which will eventually lead to its development, an increase in trade, and, as a result, an increase in the welfare level of people and the world.

REFERENCES

- Anderson, K. and Strutt, A. (2011) *Asia's Changing Role in World Trade: Prospects for South-South Trade Growth To 2030*. Asian Development Bank Economics Working Paper Series, No 264: 1-53 <<https://think-asia.org/bitstream/handle/11540/2019/economics->>.
- Bajpai, A. (2012). The “Rise of Asia” thesis: strategic constraints and theoretical deficits. World affairs. *The Journal of International Issues*, 16(2), 12–37.
- Behdani, B., Wiegmans, B., Roso, V. and Haralambides, H. (2020) Port-hinterland transport and logistics emerging trends and frontier research. *Maritime Economics and Logistics*, 21, 1-25.
- BitNautic. (2020). *Why is Maritime Shipping Important?* viewed 17 September 2021 <<https://medium.com/@bitnautic/why-is-maritime-shipping-important-6a1cd7cc99ef>>.
- Chu, F., Sven, G., Liu L., and Ni, L. (2018). *The Future of Automated Ports*. McKinsey & Company, viewed 21 September 2021, <<https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/the-future-of-automated-ports>>.
- Cousins, P.D. and Mengüç, B. (2006). The implications of socialization and integration in supply chain management. *Journal of Operations Management*, 24 (5): 604-621.
- Cowen, D. (2014). *The Deadly Life of Logistics: Mapping Violence in Global Trade*. University of Minnesota Press.

- Deloitte. (2020). *Global Port Trends 2030. The Future Port Landscape*. viewed 24.03.2022
<<https://www2.deloitte.com/content/dam/Deloitte/nl/Documents/consumer-business/deloitte-nl-cb-global-port-trends-2030.pdf>.
- Deloitte (2022). *About Deloitte*. viewed 24.03.2022
<https://www2.deloitte.com/ui/en/legal/about-deloitte.html>,
- European Union. (2018). *Competence Center on Foresight*. viewed 25 September 2021,
<https://knowledge4policy.ec.europa.eu/foresight/topic/expanding-influence-east-south/power-shifts_en>.
- Franco, J. (2016). *Multimodal Transport Regulation and Case Law*. viewed 25 September 2021,
<<https://www.lexology.com/commentary/shipping-transport/colombia/franco-abogados-asociados/multimodal-transport-regulation-and-case-law>>.
- Fruth, M. and Teuteberg, F. (2017). Digitization in maritime logistics—What is there and what is missing? *Cogent Business & Management*, 4(1), 1411066.
- Gulzar, A. A. (2021). Factors Affecting Curriculum Development. *Educare*. viewed 20 October 2021, <<https://www.educarepk.com/factors-affecting-curriculum-development.html>>.
- Haezendonck, E. and Langenus, M. (2018). Integrated ports clusters and competitive advantage in an extended resource pool for the Antwerp seaport. *Maritime Policy & Management*, 46 (1), 74-91 DOI: 10.1080/03088839.2018.1471535
- Kia, M., Shayan, E and Ghotb, F. (2010). The Importance of Information Technology in Port Terminal Operations. *International Journal of Physical Distribution & Logistics Management*, 30 (3/4): 331-344.
- Langen, P. W. and Haezendonck, E. (2012) Ports as Clusters of Economic Activity. 638-655 in Wayne K. Talley (Ed.) *The Blackwell Companion to Maritime Economics*. Blackwell Publishing Ltd. Published .
- Lavenex, S., Serrano, O. and Büthe, T. (2021). Power transitions and the rise of the regulatory state: global market governance in flux. *Regulation and Governance*, 15(3), 445–471.

MAERSK. (2021). *Supply Chain Efficiency Through E-Connectivity. EDI Solutions: Digital Solutions*. viewed 20 August 2021, <https://www.maersk.com/supply-chain-logistics/edi-solutions?gelid=CjwKCAjw7rWKBhAtEiwAJ3CWLFnpyknHyf_IDQSEVD-FDJXVvcymSJSdcw7Jn_xLEqLifhmYXVCTWRoC7SUQAvD_BwE&gclidsrc=aw.ds>.

Ng, K. (2006). Assessing the attractiveness of ports in the North European container transshipment market: an agenda for future research in port competition. *Maritime Economics and Logistics*, 8: 234–250.

Notteboom, T. (2008). The Relationship between seaports and the intermodal hinterland in light of global supply chains. *OECD, International Transport Forum, OECD/ITF Joint Transport Research Centre Discussion Papers*, viewed 5 September 2021, <https://www.researchgate.net/publication/23535797_The_Relationship_between_Seaports_and_the_Inter-Modal_Hinterland_in_Light_of_Global_Supply_Chains>.

OECD. (2019). *Ocean Shipping and Shipbuilding*, viewed 17 September 2021, <<https://www.oecd.org/ocean/topics/ocean-shipping/>>.

Ozment, J. and Keller, S.B. (2011). The future of logistics education. *Transportation Journal*, 50 (1):65-83.

Panayides, P. M. and Song, D. W. (2013). Maritime Logistics as an emerging discipline. *Maritime Policy and Management*, 40 (3): 295-308.

Review of Maritime Transport. (2020). viewed 22 September 2021 <<https://unctad.org/webflyer/review-maritime-transport-2020>>.

Rodrigue, J.P. and Notteboom, T. 2010. Foreland-based regionalization: integrating intermediate hubs with port hinterlands. *Research in Transportation Economics*, 27(1): 19-29.

Rodrigue, J. P., and Notteboom, T. (2022) Port Clusters, in Notteboom, T.; Athanasios, P. and Rodrigue, J.P. (Ed.), *Port Economics, Management, and Policy*. New York. Routledge Publishing. viewed 05. March 2022. <<https://porteconomicsmanagement.org/pemp/contents/part4/port-clusters/>>.

- Singh, A., Chhetri, P. and Padhaye, R. (2016). Understanding the Port-Centric Logistics Clusters: Concepts, Characteristics, and Measurements. *Innovative Solutions for Implementing Global Supply Chains in Emerging Markets*. (1st ed.): 257-272 IGI Global PA, USA.
- Sohal, A. S. and Rahman, S. (2013). Use of Third-Party Logistics Services: An Asia-Pacific Perspective. In J. H. Bookbinder (Ed.), *Handbook of Global Logistics: Transportation in International Supply Chains International Series in Operations Research and Management Science*, 181: 45-67. Springer.
- Sun, L. and Song, G. (2018). Current state and future potential of logistics and supply chain education: a literature review. *Journal of International Education in Business*, 11 (2):124-143.
- The World Bank. (2020). *Alternative Port Management Structures and Ownership Models. Port Reform Tool Kit*. viewed 15 August 2021, <https://ppp.worldbank.org/public-private-partnership/library/port-reform-toolkit-ppiaf-world-bank-2nd-edition>>.
- Tongzon, J. and Sawant. L. (2007). Port choice determinants in a competitive environment. *Applied Economics*, 39 (4): 477-492
- UNCTAD. (2001). *Implementation of Multimodal Transport Rules*. viewed 25 September 2021, <<https://unctad.org/system/files/official-document/posdtetlbd2.en.pdf>>.
- Vermunt, J.D. (2005). Relations between student learning patterns and personal and contextual factors and academic performance. *Higher Education*, 49(3): 205-234.
- Yap, W.Y. (2020). Competitiveness and Competitive Advantage of Ports. *Business and Economics of Port Management: An Insider's Perspective* (1st ed.). Routledge.
- Wang, Y. and Sarkis, J. (2021). Emerging digitalization technologies in freight transport and logistics: Current trends and future directions, *Transportation Research Part E: Logistics and Transportation Review*, 148:102291.
- Woodburn, A. (2010). *Hinterland Connections of Seaports*. United Nations Economic Commission for Europe. viewed 2 September 2021 <<https://unece.org/DAM/trans/doc/2010/itc/ECE-TRANS-210.pdf>>.