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On the particularities of the maritime education

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Abstract. The paper figures out the peculiarities of the maritime learning system considering the actual challenges and requirements of both merchant and naval seafarer professions with risks of accidents, war or conflict zones, sea deriving mines, robbery, and piracy with their plethora of negative intricacies on seafarers life and impacting the life and wellbeing of their families, too. The article also focuses on reducing maritime strain and increasing marine profession attractivity in a complex environment with demanding positions regarding erratic pandemic situations or a global economy changing continuously. Not at last, computer-based or simulator training is considered beneficial for maritime education.

Keywords: Maritime Education and Training (MET), New Technologies in the MET, Maritime Transportation, Vocational and Academic Education

1. Introduction

The shipping industry is the most international activity, being regulated, operated, outfitted, and bankrolled globally. A commercial vessel can have owners in one or more countries, technical management assured from a different state, conduct international trading, have the crew provided from a bunch of countries, and be registered in one or more states due to the flag of convenience facility [1].

Despite the possibility of receiving above-average remuneration after graduation, there are still a series of causes for which the maritime sector, the most dynamic and responsible for conveying more than 80 percent of global trade, will suffer from a shortage of adequately trained employees [2-4].

The seafaring profession is complex; maritime accidents with huge impacts on financial assets, human life, or marine ecosystem sometimes accompany the maritime environment. Moreover, there are sea basins with complicated situations from a pollution point of view; in such areas, imposed restrictions concerning water and air pollution. Along the same line, it is thought that piracy and sea robbery are past occurrences, but it is a reality nowadays. Thinking of the Black Sea, the conflict in the area and sea-deriving mines make the mariner profession less attractive or, from the ownership point of view, more expensive to pay for crew wages and ship operations [1, 2, 4 - 14].

The sea environment is not the end of issues for a fresh graduate cadet searching for a job in a respected shipping company; before his admission, he must provide some onboard training, the same training which sometimes companies are not eager at all to facilitate [1, 15].

Maritime institutions for training and education will have to deal also with the fear of young people going to sea in a crew consisting of a mix of nationalities, cultural levels of training and awareness regarding safety of ship operations, poor communication with families, extended periods away from home and families [4, 16].

Not of less importance are, for the maritime domain, the economic crisis with reduced demand for freight transportation when officers and ratings will face difficulties in finding well-paid jobs or the periods of leave sea time will be extended with payment reduction or even jobless situations [1, 17].

The COVID-19 pandemic proved that things could get rapidly from bad to worse, and the global situation can come from an epidemic situation to a general lockdown with no means for ships to get into ports, be supplied, receive minimal medical assistance, shift the crews or get minimal supplies [16, 18, 19].

The factors mentioned above, touching on the maritime education process, are just a part of a complex system of intricacies and dependencies; some of them will be investigated more exhaustively in the next section of the paper. After considering these, the paper will get inside the digitalization of education and figure out some post-COVID-19 lessons learned, the concluding part being about outcome-based training and education.

2. Method

The methodology of the paper consists of analyzing the most relevant factors affecting MET based on a rational, relevant literature review in the field of MET and marine accidents literature, as the human factor is responsible for a consistent share among the causative factors for maritime accidents occurrence.

Along with the literature review, the authors highlight some actual and future trends in the evolution of the seafaring market and the impact of these evolutions on MET [1, 2, 4, 16-19].

The paper also analyses how MET curricula adapt to the most relevant provisions related to maritime training and how these provisions are amended following the latest safety events in the maritime domain [20].

3. Research

Among the factors impacting the maritime education system can be enumerated factors internal of universities and external. Here, in this chapter, a few of them will be considered.

3.1 Lecturers and lectures

Most maritime universities are furnished with experienced mariners, mainly former ship masters or at least officers in managerial positions. Concerning lecturers' visibility and professional experience or mastery of knowledge, rare face some issues. They occur in institutions that cannot pay adequate salaries to their professors, or the management policy is to invest more in hardware assets than human resources. Along the same line, a very good professional mariner is not necessarily a good teacher, so it is highly required for the mariners recruited for teaching activities to perform some teaching educational programs.

Rather than mastering the knowledge, the lecturers have to be capable of sharing the knowledge in such a manner that the students will be able to catch and will be attracted to the marine profession and will pay respect to their lecturers and not, at last, will become promoters of maritime profession among their colleagues.

The curricula must also be updated and adequate to match the merchant and naval fleet requirements. Not at last, the lecturers are to be able to develop programs of disciplines and curricula easy attainable by the students and user-friendly [1, 2, 4, 15, 21].

3.2 Educational infrastructures

Nowadays, the era of using a chalkboard and delivering an oral course presentation is obsolete. State-of-the-art classroom infrastructure was able to support any lecture with digital support, laboratories furnished with the latest simulators and able to use IoT (Internet of Things) facilities, conference mode, use of uncrewed vehicles as sensors being just a part of modern infrastructure suitable to support a quality process of learning.

Adequate logistics of the university are always desirable for university administration. However, the scarcity of resources, mainly in less developed countries, brings attention to inadequate infrastructure or some state-of-the-art facilities used to be presented during inspections [1, 2, 16, 22].

3.3 University Prestige's

Though not official, it is a reality that most crewing agencies and ship management prefer to recruit a labor force trained by the universities with the highest rank among the schools with maritime profiles.

The university's fame comes from its academic team and adequate and state-of-the-art educational facilities.

For students, admission and the taxes for such prestigious schools are not affordable, but the promise of proportional remuneration after graduation will compensate for the effort [1, 2].

3.4 Onboard training

A factor considered by both students and mainly maritime companies is the ability of the maritime university to provide onboard training to their students or to have agreements with shipping companies to ensure the opportunity for the cadets to receive onboard training. In this respect, there is a strain between the requirement of companies to receive trained personnel and the refusal of the same companies for economic reasons to receive cadets on board their ships [15, 23, 24].

3.5 Marketing and external influences

In many situations, student choice is highly influenced by the opinions of parents, relatives, classmates, friends, and neighbors, most acting as marketing agents for maritime studies and professions.

The stereotypes around the maritime profession are mostly related to the substantial payment received after joining a sea job or, in lesser cases, related to a respected field of study that offers further options for development in at least three directions: onshore-related jobs, offshore jobs, and maritime education.

The university's marketing also contributes to a high degree in orienting young people toward maritime studies and professions. Universities that find ways and events better present their programs and benefits offered will gain competition for students [2].

4. Discussion

COVID-19 posed a high stress on the maritime sector, both in the learning system and the shipping. The perspective of a profession with enormous difficulties and hard times during pandemic events is a significant shortfall when considering the attractivity of such training and different profession. Nevertheless, in this regard, COVID-19 showed us that possibilities to overcome such events exist. With adequate communication infrastructure, both students could complete their courses, and sailors to be in contact with their families and their company's management.

The matter of digitalization in maritime training is familiar; simulators were a presence even a long time ago before the recrudescence of actual high-technology assets. In this respect, there is a slight tension regarding the fact that some experts know about the simulated event and others in IT or computer systems are developing the simulators. Ideally is that the expert designing the simulator masters the maritime domain knowledge too.

In the maritime domain, things are moving very fast, and the same will occur in maritime training, automation of processes will become normality, and the use of sensors such as uncrewed vehicles, Internet of Things, mobile Internet, augmented and virtual reality, or things like this are already standard. The point is not if they will occur; the essential is to have qualified and competent lecturers able to use such systems and transmit to their students the exponential benefits of such devices.

Faculties must bring high technology into the classroom, foster cooperation and integration with the shipping industry sector, and develop new research opportunities with their students.

In terms of safety, digitalization in the maritime domain is a revolution; replacing the human factor responsible for more than 80% of accidents will increase the safety onboard and reduce financial, property, social and ecological burdens occurred in case of naval accidents.

These facilities have a cost, and they enforce an obligation for maritime universities and mariners; in case of failure of highly automated equipment, the cost is enormous, so, with this regard is a must that universities be able to provide proper training regarding the operation of highly automated equipment [16, 18, 19, 22, 25-27].

The outcome-based education, this new approach regarding measuring the effectiveness of the learning process is based on the learning outcomes displayed by the students at the exit of a study cycle.

The traditional way of measurement is to gauge the credits gained by the students or the time passed during courses; now, with this OBE, a restructuring of the curriculum is required along with evaluation tools to emphasize the place where the student is situated in reality.

Regarding the students, they will be interested to learn more considering this new way of evaluation, and the curricula should be revised periodically in cooperation with the students.

5. Conclusion

The success of the maritime education system is affected by a series of factors, some belonging to the institution and others being external universities. Most correlate with teachers' quality, university logistics, administration, and programs.

COVID-19 harmed shipping activity and maritime education and training. Temporary measures to sustain MET are taken gradually. It is understood that distance learning methods and tools should be improved to support an uninterrupted education system.

Digitalization in maritime training systems is a need, and maritime education must be in the same paradigm of the exponential evolution of highly automated systems.

The MET aims to ensure meeting the requirements represented in the STCW. Outcome-based care is advised for all levels of MET, planning, execution, and evaluation.

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