

# Sustainable Maritime Career Development: A case for Maritime Education and Training (MET) at the Secondary Level

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**ABSTRACT:** This study interrogated the relevance of maritime education and training (MET) at the secondary level as an effective strategy for developing a sustainable supply of maritime labour and to mitigate current and future supply-demand imbalances arising from philosophical and sociological changes in society and in the maritime industry. Secondary education and its associated curriculum may be developed to form the underlying fundamentals of early awareness of maritime concepts targeted at youth of ages 11-18 years. To find answers to five research questions relating to this topic, a mixed method approach was applied in collecting and analysing data. The findings indicate strong evidence of the importance and relevance of MET at the secondary level. They further show this importance as it relates to an appreciation by the youth of the maritime industry as a domain for technical career options and to the creation of a sense of stewardship of the world's oceans. Despite these positive findings, the study also finds that a number of key stakeholders are unaware of the potential and role of the maritime industry leading to a notable barrier to the implementation of MET at the secondary level and a lack of the necessary rigour and focus on promoting the industry to the youth via MET in secondary education. The study concludes by noting that there is a need for a focus on reforming the curricula of national secondary education system, where appropriate, as a first step towards the achieving the benefits of implementation of MET at the secondary level.

## 1 INTRODUCTION

Shipping, or the maritime industry as a whole, has been described as the "lifeblood of world trade" without which "half the world will freeze and the other will starve" [26]. What is often not as clearly stated is that seafarers are the lifeblood of the shipping/maritime industry! Indeed, in earlier decades of shipping, the availability of competent seafarers was taken for granted. However, developments since the late 1970s show that this assumption of an unlimited supply of seafarers was flawed. Seafarer competence is increasingly recognized as a sine qua non in a context of increasing complexity of shipping and greater dependence of

world trade on the shipping industry. Together with a number of significant accidents attributable to the so-called "human element", an increasing perception of a "shortage of seafarers" (both in terms of numbers and quality) has culminated in a near global drive to increase the attractiveness of a seagoing career to young people and to highlight the merits of a life at sea. Such efforts were primarily initiated under the auspices of the International Maritime Organization (with a "Go to Sea Campaign"), but with significant expression in national contexts. These efforts sought to optimize strategies for attracting young persons to a seafaring career. More recently the IMO, with reference to creating a concept of a sustainable maritime transportation system, indicated three goals

relating to the “education and training in maritime professions, and support for seafarers” [16].

It is noteworthy, however, that in the main, the attempts make no reference to or was vague in their interrogation of early exposure to students of the maritime industry. The approach has been essentially a “maritime industry marketing approach” targeted at individuals at the cusp of a career choice, which approach sought to have the maritime industry “compete” against other potentially attractive careers. However, the sustainable supply of seafarers, rests on much more than the marketing of the shipping industry to near post-secondary students. It is related to the nature of demand of seafarers (kind and number of ships, for example), a consciousness and understanding of the workings of the shipping industry, its importance, challenges, opportunities and future. One other more recent area of focus is the need for a supply of seafarers who have values that underpin the sustainable use of the ocean; a more intrinsic valuing and resulting stewardship of oceans, the context of shipping today. All these and other factors and influences cannot (or should not) to be exposed to potential seafarers just when they are about to complete the second-cycle of education via a marketing programme. The merits of such an approach may be deemed to be questionable. Indeed, opportunity and long-term commitment to a career is driven by early introduction and exposure to that career [29].

Despite that tendency to target entry point career individuals, it does appear that there is evidence that supports the introduction of MET at the secondary level and indeed suggests a necessity to do so. This is akin to the observation made by [29] when they suggest with respect to early childhood education in America to bring about meaningful change through early exposure to potential careers (Haun, 2014).

The above suggests that it is important to target the youth at the secondary level by creating dynamic and robust mechanisms (including appropriate curricula design and extra-curricular activities) that potentially lead to a sustainable supply of first, seafarers and secondly long-term professionals in the wider maritime cluster.

As Haun [12] has noted, secondary schools that provide maritime education teach subjects related to the training and skills required to work in the maritime sector, whether it be as a crew member at sea or shore side such as in a marine shipyard or port facility.

The term “maritime” is sometimes used “variably and interchangeably” with the term “marine” [14]. In this paper, we use the term “maritime” to refer to the human activities (transport, tourism, fishing etc.). Activities that takes place within the natural environment context, we term “marine”. Though the confusion with the use of the terms persist these two terms are complementary when education is in view. Ultimately it is necessary that training for sustainable maritime purposes, has to be down with a deep appreciation of the need for optimum stewardship of the marine environment. As Hildebrand & Schröder-Hinrichs (2014) note, “after all, it is but one marine environment that supports a thriving maritime

industry” [14]. Maritime education and training (MET), is used here to refer to education and training for the human related activities associated with the maritime industry. Additionally, maritime education and training can be defined as the acquisition of the knowledge and skills related to subjects in the maritime field that enhance competence in the maritime context. The acute deficit of basic maritime knowledge in lower levels of educational systems in many jurisdictions, requires more focussed discussions and action from stakeholders in the maritime industry. Such foundational knowledge is beneficial for prepared young students for a transitional path to higher levels of learning in the field, hence, contributing to better competence and a sustainable supply of qualified human resource. Furthermore, citizens of the globe need an awareness of the global industry that shipping is. One medium of accomplishing these targets successfully is through purposeful focus on the youth at the secondary level.

The maritime industry has been defined, in general terms, as “all enterprises engaged in the business of designing, constructing, manufacturing, acquiring, operating, supplying, repairing and/or maintaining vessels, or component parts thereof: of managing and/or operating shipping lines, and customs brokerage services, shipyards, dry docks” [24]. The expansion of the industry has given rise to new services and careers. This can be seen through the increasing growth of seaborne trade that (somewhat tempered by the global depression of 2008-9) which is has resulted in the shortage of competent seafarers [1]. Additionally, the perception in some quarters of a lack of maritime industry awareness by the global community, concerns regarding the risks associated with ship operation and rapidly increasing technological innovation, among others, are evidence of the need for new thinking and strategies in education and training to meet the demands of the industry.

In a study done to ascertain student’s motivation and expectation of studying maritime undergraduate programme in three countries Greece, Hong Kong, and China it was revealed that most of the students enrolled in the undergraduate programme came straight from the secondary school. “Students who have enrolled for an undergraduate programme in maritime studies have typically completed secondary level education in the previous academic year” [32]. The authors observed that the whole area of student inclination, access and experience of maritime education and training programmes is under-researched, and as such, the real motivation of students is unknown. However, their own research showed that most of the students were motivated by maritime history in their close family and area of habitation. This was further supported by M’Pherson [27], when he states, except a young person comes from a family living near the sea or has some nautical background or tradition then the sea has little or no interest to him. Farthing, Brownrigg & Mukherjee [28], in similar vein also note that there exists a cultural trend in families characterised by members having careers or business in shipping, to have the younger generation pursuing similar careers. An important question to be asked is: should the future of the maritime industry be left to family or to

community traditions? The historical channels by which people enter the industry is, arguably, not compatible with the increased contemporary needs of the industry nor for projected needs and global sustainability issues for the future. A formalized strategy to sustain the workforce is necessary.

## 2 PSYCHOLOGY OF MET AT THE SECONDARY LEVEL

Traditionally, formal secondary education occurs between about ages 11-13 and 15-18 [39]. This is a very important stage in the development of young people. As noted by Salyers and Mckee [38] “young people between 10-15 years are at the peak of forming values and making decisions that will impact them for the rest of their lives”. This is as a result of the brain going through what has been referred to as “hardwiring,” which continues throughout adolescence. Meaning, intellectual activities and practical skills to which the youth is significantly exposed, and which they have the greatest opportunity to strengthen, will influence learning and choices for the rest of their life. Piaget, in his theory on the development of children, noted that during the period from 11 to 15, abstract thought and hypothetical thinking is concretized into lifelong learning [37]. It can concordantly be assumed that engaging the youth during this stage with maritime concepts will provide a greater opportunity of inculcating in them respect for and attraction to a maritime career – from operational seafaring to custodial awareness of the ocean to leadership roles in maritime policy development and implementation.

## 3 PURPOSE OF GENERAL SECONDARY EDUCATION

To support a view that encourages the introduction of maritime concepts at the secondary level, it is necessary to develop an appropriate analytical framework of the purpose of secondary education. This is to help assess whether there is a valid premise for introducing MET at this level. Secondary education is a massive system that ideally emphasizes open access and universal coverage of education [41]. It purports to be meaningful and relevant to society and culture. It must consist of multiple and divergent bodies of knowledge and provide equal opportunity of content and quality of knowledge [33]. Even very early research sources acknowledge that this level of education, in many cases, prepares boys and girls for their calling in life (see for example [10]). On the other hand, it is the platform for preserving culture by training the younger generation through a social learning process that integrates them into the wider society and generate an identificatory process with role models [2]. Additionally, it trains skilled labour for the workforce [6], while connecting the youth with their individual interests and stimulating a passion for new ones [39]. On a broader scope this level of education liberalizes and trains for participation in governance e.g. in democracy [20].

Upon careful examination of the purpose of secondary education articulated, one can extract three main elements; education for civic and political aims, education for economic and work related purposes, and finally education for the self-development of the individual in expressing and fulfilling their own passions and hopes. The first two of these elements which relate primarily to the well-being of the larger society, will be examined to substantiate the possible effect and influence secondary education and training in maritime subjects may have on the wider maritime sector.

## 4 EDUCATION FOR CIVIC AND SOCIO-POLITICAL AIMS

Citizens must be actively engaged in their communities [39] and every human needs to understand their culture, political system, rights, responsibility and heritage [25]. Civic knowledge informs learners about national views while at the same time expanding global perspectives. Additionally, cultural studies afford students at the secondary level opportunities to develop national pride, patriotic identity and societal core values that are engraved in the sociological and philosophical orientations of the particular society. Fiqueredo & Anzalone [8] have found that for democracy to survive, for example, citizens must be informed and participate in holding officials accountable. Furthermore, Kahne & Middaugh [18] note that “knowledge in civics, supports future engagement among the youth”. As such, students at this level develop the capacity to critically examine matters and to make meaningful decisions that will impact change [6]. Secondary education in the 15th century trained religious leaders [15]. In the 17th century in the American setting, secondary education prepared young people for service in law, religion and college [7]. Another example of a jurisdiction focusing on secondary education to achieve a specific social outcome, is given by Johnson [5] who describe how the threat of the Soviet Union propelled the United States, in 1958, to fund secondary education as a strategy to optimize security.

As stated by Kamens, Meyer, & Benavot [41], secondary education is generally characterized by open access and, ideally, universal coverage, implying that all future leaders are trained at this level: future policy makers, presidents, prime-ministers, royalty, doctors, lawyers, maritime experts, principals, scientists, researchers and parents. Furthermore, an appreciation for national pride, culture, and heritage spills over into an obligation to safe guard natural resources the environment, the sea, land, air and natural habitat among others. The youth cannot care for what they are not aware of. Against that background, an appreciation of the maritime environment, activities and infrastructure must be taught at this level to influence civic and political decisions for present and future prospects – including the development and implemental of right policies and legislation at both local and international levels. For this to become a reality, optimal maritime educational policies and the supporting frameworks

are key. However, given that many national legal and administrative systems only started to develop a legal domestic maritime commercial framework in the early part of the 20th century [21], one can suggest that quickly creating good policies for MET at the secondary level to impact the wider maritime community may be a significant challenge

## 5 EDUCATION FOR ECONOMIC AND WORK-RELATED AIMS

Technical education has been found to equip students with a wide range of career possibilities [39]. The academic framework at the secondary level provides employability skills. In recognition of this, a rigorous career focus at the immediate post-secondary, but more importantly at the secondary level, has been widely promoted in countries such as America [4]. It was noted that two thirds of the jobs created in the US by 2018 will require some form of post-secondary education. Furthermore, a number of government such as Australia [19], Jamaica [9] and the Organization for Economic Co-operation and Development (OECD) countries created a public policy of national career guidance to be taught in public schools [30]. Such education prepares the labour force for the job market both in terms of professionalism and competence for the relevant industries. Technical education prepares students for future career opportunities [4]. The above indicates that MET at the secondary level fits perfectly within the benefits of technical education for present and future career possibilities in the maritime industry. To further demonstrate the necessity of MET at the secondary level in this career context in specific jurisdictions, reference may be made to numerous examples of schools visited for career expositions in Jamaica, where it has been observed that students had minimal levels of awareness of the maritime industry and its opportunities. For the most part, institutions offering courses/programmes in medicine, business, technology, teaching, agriculture, music, law, and political science among others, received far more responses to requests for applications. Those offering maritime programmes spent more time educating prospective students about the industry. For more reasons than one, it is crucial to get the maritime training and career out in front of the younger generation, and to do so early in their education in order that they would appreciate this industry as offering viable career options and personal development. Peterson [34], for example, reiterated the need for younger workers in the merchant marine industry to be recruited and developed to replace those retiring as well as those who no longer choose to work in the industry. There are a number of attractive and illustrious career options in the maritime industry that need to be advertised [13].

## 6 ASSESSING THE PURPOSE OF SECONDARY EDUCATION IN THE MARITIME SECTOR

Secondary education over the centuries demonstrated an expansion, inclusion and diversification of subject

topics for the existing needs and growing concerns of labour, security, leadership, economics, politics and other socio-cultural issues. However, generally speaking, there has been a great lack of the maritime content at that level. It has been found that the industry has been passive in 'pushing' young people to pursue higher maritime education through the introduction of relevant courses [32]. One has to bear in mind the nature of the maritime industry; it is multinational, multicultural and operates in a multifunctional and harsh environment. To facilitate working in such a high-risk environment, seafarers must be competently trained and if this training starts at the secondary level it can have far-reaching results. The industry has increasingly become the focus of new environmental rules and regulations, and must now comply with a broad array of requirements in the areas of air and water quality, hazardous waste disposal, and aquatic species protection [11]. Safety in the maritime industry also requires standards to be set at an international level, and maritime education and training at all levels should play a key role in asserting the need for consistent, uniform education and awareness. The basic tenets of secondary education policy are the established understanding that every young person with a secondary education will be able to increase their productive capacity and ultimately contribute to individual, and societal advancement. The absence of particular knowledge content will ultimately lead to a lack of response of the youth in that field.

## 7 THE SECONDARY CURRICULUM

In advocating for the appreciation of the relevance of MET at the secondary level, it is crucial that the matter of curriculum development is discussed. Curriculum development is influenced under three main domains: philosophical orientation, psychological consideration and sociological influences [36].

The philosophical orientation examines the aims and values of society. It provides clarification of concepts that examine the epistemology and ontology of the curriculum, for example, what particular knowledge is required to address societal concerns. Within that framework the following questions, among others, are relevant (Print 1993). On what grounds should the content be selected and taught? To what degree should the new reality of society be reflected in the curriculum? What is the status quo of the society that requires such knowledge? Who are the stakeholders in the education sector and what are their primary concerns? Should the curriculum seek to address current needs or future anticipated trends?

The psychological consideration takes note of the pedagogical approach, application of different learning theories, the kind of learners, the learning environment, teaching methods, instructors, assessment and evaluation that may be employed to achieve the desired outcomes of the curriculum.

The sociological orientation of the curriculum addresses the societal concerns, namely: culture, social changes, ideology, technological structure, emerging trends and challenges. These factors encapsulate the

scope of an integrated, systematic and systemic thinking that influences curriculum development.

The process of curriculum development is referred to as 'institutionalization' where the rubber meets the road [3]. If it is poor then the education will be poor no matter the infrastructure, budget, support or qualified instructors. The heart of what is taught and what students learn is embedded in the curriculum [40].

One of the fundamental obstacles for implementing MET at the secondary level is the highly bureaucratic process of curriculum development. It is believed that the process is highly politicized [35]. The process is influenced by a number of stakeholders including teachers, parents, students, government and industries [36]. Each stakeholder may bring to the process their own interests be they political, economic or socio-cultural.

As stated by Print [36] the curriculum should address societal needs. There is clear evidence of existing needs experienced by the maritime industry which requires societal response for the benefit of the wider society. It is noteworthy to develop appropriate curricula for MET at the secondary level, it is critical that all stakeholders, in particular direct maritime industry operators, contribute to the discussion and discourse.

## 8 MET AT THE SECONDARY LEVEL

An important factor alluded as a major concern in merchant marine shipping is the human element. Milhar Fuazudeen, Head of the Maritime Training and Human Element Section at the IMO, (during a lecture at the WMU on July, 16, 2015) stated that many people mistakenly focus exclusively on seafarers when considering the "human element" in the maritime industry. The term should be deemed to include all persons involved in the maritime industry. "The shipping industry is run by people, for people. People design ships, build them, own them, crew them, maintain them, repair them and salvage them. People regulate them, survey them, underwrite them and investigate them when things go wrong" [23]. Humans are the centre and hub of shipping from passage planning to policy making. Arguably the notion of "human element" can be extended even wider to people who are not directly involved in the maritime industry. To illustrate, take for example the medical personnel who examine seafarers and are entrusted with the provision of accurate diagnoses, the spouse/family that contributes to the state of mind of the seafarer (positive/negative), the instructor who trains for competence, the media that influences potential applicants, (positive or negative) about the industry, the policy makers or government officials and representative of the citizenry who ratify and implement conventions for safer and cleaner oceans. Given this rather wide scope, it can be further argued that the best place to ensure a wider awareness and appreciation of the maritime industry is at the secondary level.

With specific reference to seafarers, the need is even greater. An important challenge facing the

shipping industry today is how to attract and retain a sufficient number of adequately trained and qualified seafarers and qualified maritime industry professionals with the right motivation, knowledge and skills for the professional application of evolving technologies and procedures. This challenge will increase as world trade continues to grow and shipping activities increase accordingly [16]. In the words of the immediate-past Secretary-General of the IMO during the 2nd session of the Sub-Committee on Human Element, Training and Watchkeeping (HTW):

Take a look 15 years ahead, 2030, what will the volume of trade be in 2030? Obviously, nobody can tell, but amongst the approximately half million officers available today, probably 150,000 would have left by 2030 due to retirement. Just to maintain the current workforce of officers, 10,000 new officers must be trained and provided every year to fill the gap created by retiring officers. If seaborne trade expands by 70% by 2030 then we need to train and produce 40,000 officers every year. If seaborne trade expands just by 35% by 2030, we will still need to train and produce 25,000 new officers every year. Maritime training is absolutely fundamental for sustainable shipping [17].

The optimum and sustainable supply of competent people (the human element) – especially seafarers - is a key challenge for the maritime industry and requires long term strategic planning. Such a long-term approach should necessarily consider the early introduction of elements of maritime education and training in national curricula and not leave that to an abrupt introduction to this domain at the university or college level.

An important point to note is the effort of IMO in promoting the industry to the youth. One such strategy was the 'Go to Sea' campaign inaugurated in November 2008. Another of IMO strategy was the commencement by the IMO of a Maritime Ambassadors Programme which seeks to have a selected group of people globally promoting the industry to the youth. These efforts at the IMO level indicate that recruiting for the industry is not automatic and therefore requires meaningful effort and policy in securing and sustaining a competent qualified workforce and is an example for national authorities.

MET at the secondary level by itself is not the panacea to the many challenges the industry faces. However, it will evoke a consciousness for urgent protection, better governance and sustainable stewardship of the oceans on which human existence depends. Good governance "includes formal institutions and regimes empowered to enforce compliance, as well as informal arrangements, that people and institutions either have agreed to or perceive to be in their interest" [31]. Therefore, to achieve a more optimal approach to maritime governance, there is a necessity for the involvement of the global village and not just policy makers or legislators. Getting the human element (which in the widest context, is everyone) involved in sustainable maritime operations and governance (and doing so early), will result in far greater successes than have been achieved in the past. This paper argues that this is achievable, in part by educating all potential and

future players, or just citizens in general, at the secondary level with a curriculum that at the least, introduces them to key issues, value of and opportunities in the maritime and marine sectors. To support this argument and to investigate views of the appropriateness of this suggestion, an exploration study was conducted. We now proceed to describe this study.

## 9 EXPLORATORY STUDY

The main goal of the study was to seek answers to questions related to the relevance of maritime education and training at the secondary level of education. The specific questions asked were:

- 1 What are the merits and demerits of MET at the secondary level?
- 2 What are the national practices and underlying policies that inform the delivery of maritime education and training at the secondary level?
- 3 What are the current trends and challenges within the maritime industry that may warrant maritime education and training at the secondary level?
- 4 How can maritime education and training at the secondary level translate to sustainable development within the maritime industry?
- 5 What is the role of stakeholders in implementing maritime education and training at the secondary level?

The research method applied in this study was the mixed method approach. Specific methods included a survey (questionnaire-based) and interviews. "Mixed-methods research helps in complementing one method with another even where these methods are derived from different methodological positions" [22].

The study included one hundred and two (102) participants. The target group of participants were those with at least some basic knowledge of the maritime industry from all levels of education starting from the secondary level and varied categories of maritime workers. Ninety-eight (98) of these participated completed the survey and six (6) were purposively sampled and interviewed. Eight (8) of the ninety-eight (98) participants took part in an initial pilot test which resulted in ninety (N = 90) as the final count for data analyses. The category of participants that were interviewed were selected on the criteria of years of service, leadership role and experience working within the maritime industry. Three of the six were professors of maritime colleges/universities, one was a student at the World Maritime University (WMU), another was a Dean at the University of South California, and finally the sixth participant was the Head of Training and Human Element in the Sub-Division for Operational Safety and Human Element at the IMO. Research participants, all of whom had basic knowledge of the maritime industry, came from thirty-four (34) countries. 60% were male while 40% were female. The average age was 42.2 with educational background ranging from secondary school certificates to doctoral degrees (see figure 1 below).

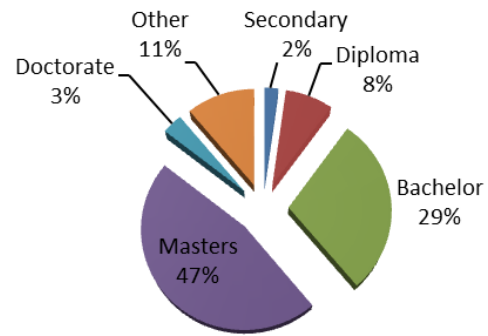


Figure 1. Respondents' educational level

Atlas.ti (qualitative) and SPSS (chi-square – quantitative) data analyses software, were employed to analyse data.

## 10 DISCUSSION OF FINDINGS

Table 1. Respondent demographics

GENDER	Male: 54 60%		Female: 36 40%			
	AGE GROUP	20 yrs.- 13%	30 yrs. 28%	40 yrs. 31%	50 yrs. 22%	60 yrs. 6%
EDUCATION	Doctorate: 3%	Masters: 47%	Bachelor: 29%	Dip./Ass: 8%	Secondary: 2%	Other: 11%
REGION	Africa 19%	Caribbean 29%	North & South America 3%	Europe 20%	Asia 29%	

The quantitative data showed 76% of the participants were employees of which 33% were managers and 10% supervisors (figure 2). 73% were aware of the industry while 81% have some affiliation with the industry. 43% were interested in the industry due to economic benefit, 36% for career interest while 33% wanted to travel to see the world. 34% stated that MET was offered at the secondary level while 54% had no MET at the secondary level in their jurisdiction (figure 3). 78% had MET at a higher level and indicated that having basic knowledge of maritime concepts would have made easier understanding of the maritime concepts at the higher level of learning.

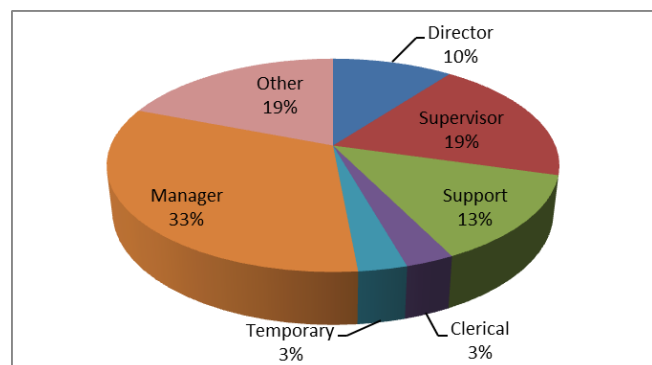


Figure 2. Response by organizational position



Figure 3. Availability of Secondary School with MET in own jurisdiction

Question 1: What are the merits and demerits of maritime education and training at the secondary level?

The perception that MET at the secondary level had merit was related to geography, perception of economic benefits, and the interest of the government. Predictably, it was noted that programmes for maritime awareness are normally conducted in areas close to ports and MET institutions, therefore people in those areas were more or less aware of the industry. On the other hand, if there was no awareness of economic benefit for the jurisdiction, then the government shows no interest in formalising policy in promulgating MET at the secondary level. As indicated 43 of the 90 participants indicated that their interest in the industry is due to the perceived economic benefits that could accrue to them. The findings imply that economics is the primary reason for a consideration of educating the youth about the maritime industry at this level. It can be argued that this rationale is limited since the foundational purpose of secondary education should be deemed to be much more profound than just to have optimum economic outcomes.

Question 2: What are the national practices and underlying policies that inform the delivery of maritime education and training at the secondary level?

Respondents indicated that policy in their own national jurisdiction was lacking for most part, both for the sector in general and for implementing MET at the secondary level in particular. A number of the jurisdictions have only recently developed policies for their maritime sectors. Moreover, the bureaucratic processes associated with policy decision-making and implementation involves various ministries and government agencies, which require collaboration between key players of the industry and government. This collaboration was perceived as non-existent by many respondents. Another major challenge was that policy makers were not knowledgeable about the industry as a result of which they were either lethargic in their creation of relevant policies or did not do so at all.

Question 3: What are the current trends and challenges within the maritime industry that may

warrant maritime education and training at the secondary level?

Respondents agree that the shipping industry has been growing exponentially with increased shipping activities and larger vessel. Among the trends mentioned were the opening up of the polar region as a new-found area where international efforts have generated new legal instruments and training practices. Another trend articulated by respondents was the increasing attrition rates of seafarers employed at sea. Some respondents viewed MET at the secondary level as a sifting tool for helping recruit a more committed workforce, who due to early exposure to the maritime industry were knowledgeable about the challenges associated with this career choice. In consonance with the earlier discussions in this paper, respondents noted that it was necessary to increase efforts to attract younger people to a maritime career to stem the perceived increase in attrition rates.

Question 4: How can maritime education and training at the secondary level translate to sustainable development within the maritime industry?

For most part participants indicated that MET at the secondary level may have sustaining effect on the industry for the long term to influence maritime career options. The end result of such action will potentially demonstrate a sustained calibre of competent maritime professionals. On the back of that, inferential statistics (chi-square) found the African and Caribbean regions with 27.7% compared with the Asian region with 23% agreeing that MET at the secondary level sustains the maritime industry. However, the European region with 50% disagree that MET at the secondary level is a sustainable strategy for the maritime industry.

Question 5: What is the role of stakeholders in implementing maritime education and training at the secondary level?

Stakeholders' role was noted to be the epicentre for the implementation of MET at the secondary level; they are the ones to drive curriculum reform. Notwithstanding this, it was indicated that conflict of interest among stakeholders may become a challenge and if not delicately handled the process could take longer than necessary. Additionally, getting stakeholder buy-in for wholesale implementation of maritime education at the secondary level could be challenging, particularly if there were economic implications. Nevertheless, participants felt that the governments of their jurisdictions can do more to popularize the industry and to collaborate with relevant entities including in the education sector as well as those who could influence the curriculum development process to initiate steps towards implementation.

## 11 IMPLICATIONS OF FINDINGS

The findings of the study have numerous implications for different players in the industry, particular for those (like the IMO) who are seeking to increase awareness and introduce the industry as a viable

career option to the youth. There are implications for other stakeholders, particularly in the education sector and in shipping. Further, while the study showed some evidence indicating the relevance of MET at the secondary level, there are also a number of barriers that need attention. Given the wider literature and in light of the prior discussions in this paper, it may be that the relatively low agreement that MET at the secondary level is relevant is due, at least in part, to the lack of awareness by the youth and interestingly other stakeholders and policy makers. The writers consider this a key finding, a finding that suggests that awareness creation strategies - of the importance of the maritime industry (and the possible contribution of secondary education to it) - have to be targeted at the highest levels of corporate entities and also the public sector. Accordingly, the strategy by IMO to target youth through the appointment of Maritime Ambassadors in member states, should be augmented by also targeting policy makers and stakeholders to increase their awareness.

The findings further suggest that youth becoming engaged in the industry is not automatic, as national jurisdictions need national strategies for creating awareness to attract youth to the industry.

Additionally, there are implications for educators. For MET at the secondary level to become a reality there must be qualified instructors to impart knowledge. Therefore, there is a need to have workshops and seminars to educate secondary level teachers. In addition to targeting the youth (or perhaps for some time, in lieu of that) secondary teachers should be a target group for the IMO Maritime Ambassadors.

There is also an implication for entities that write and publish magazine and journals about the maritime industry. The target audience needs to be re-assessed. There is the need for literature aimed at lower levels for the youth, for example, incorporating cartoons, comics, videos, social media, advertisement in the media. These literatures may be used to augment existing teaching resources at the secondary level of education.

Finally, the relationship between the level of education and the category of the worker showed no statistical significance in terms of maritime awareness. Also, the level of education or rank of authority was shown not to have a bearing on how much is known of the industry. This could suggest that all levels and categories of workers need an awareness of the wider maritime industry, even for organizations purportedly working in specific areas of the industry. There is a need for governments to collaborate and coordinate with the industry on how they can bring awareness and implement MET at the secondary level in an economical way. Additionally, educating the public about the manifestations of the maritime industry within the particular local context, as well as identifying stakeholders and clarifying their roles in that context, is necessary.

## 12 CONCLUSION

Respondents in the study suggested to a degree that there is relevance for MET at the secondary level. Its implementation is influenced by economic and geographical factors as well as national interest. It was found that one strategy to address the challenges of a sustainable supply of seafarers in particular, and human resource for the wider industry in general, is to increase awareness and via that, the entrance of the youth to the industry. However, there is need for relevant national policy frameworks, political will and collaboration of the relevant stakeholders to influence secondary curriculum reform and development. MET at the secondary level is a paradigm shift that is befitting a global industry. It is important to educate global citizens of a global industry for a sustained supply of high-calibre professionals. The result of such implementation may create solutions to help mitigate current and future trends and challenges experienced by the industry.

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