Vocational and academic approaches to maritime education and training (MET): Trends, challenges and opportunities

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Abstract Traditional seafarer training has always focused on the acquisition and use of practical skills. The prevailing view is that, while this approach addresses a degree of cognitive skills, it focuses on and gives much more emphasis to the acquisition of hands-on practical skills for the performance of specific tasks. On the other hand, academic education has been seen to be much more focused on the development of in-depth analytical and critical thinking skills; cognitive skills that are less reliant on hands-on task-oriented training, but stress critical reading and discussion. The global trend in maritime education and training is increasingly to link an essentially vocational education that provides specific and restricted competence outcomes with more general or deeper academic components leading to an academic qualification. This trend has led to some dilemmas for curriculum development, for training legislation in a global industry, and for achieving desired learning outcomes in a professional setting (in the shipping industry). This paper discusses some of the challenges arising from this trend and the opportunities the trend offers.

Keywords Vocational · Academic · Maritime education and training · STCW · Trends · Challenges and opportunities

1 A historical perspective of global maritime education and training (MET)

In almost all countries and cultures of the world, operational education and training for transportation on water has origins in an on-the-job training paradigm. The first attempts at codifying international training of seafarers were undertaken under the auspices of the

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International Labor Organization (ILO) via the Officers' Competency Convention (ILO C53) of 1936. The convention, among other things, required that "no person shall be engaged to perform or shall perform on board any vessel to which this Convention applies the duties of master or skipper, navigating officer in charge of a watch, chief engineer, or engineer officer in charge of a watch, unless he holds a certificate of competency to perform such duties, issued or approved by the public authority of the territory where the vessel is registered."¹ No specific standards were stated in ILO C53. The first international convention to set out specific standards to be met by seafarers was the 1978 International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), which entered into force in 1984. Despite being such a seminal convention, its limitations were many, not least the bias towards a cognitive education paradigm whose outcomes were vague and not optimally addressing the on-the-job competence requirements of industry. This, together with other factors, led to calls for a revision, which resulted in substantial amendments to the regulatory annex to the convention in 1995. Among other things, the perceived deficiency of skill-based competence requirements was rectified. With the addition of many specific competence standards in a new Seafarers Training, Certification and Watchkeeping (STCW) Code—standards which were to be evaluated by observable competence criteria—the focus on task-based competence was brought back. This was an important development and created a framework for increased focus on competence as the bedrock of work at sea. The 2010 Manila Amendments to the Code in the main retains this paradigm, a vocational educational approach whose task-structured nature relies very much on criterion-referenced and outcomes-based assessments that are mainly in the skills domain. The Convention (in its accompanying Code) explicitly indicates expected standards of competence, the associated knowledge, understanding, and proficiency required, and importantly the methods for demonstrating competence and criteria for evaluating such demonstration of competence. This is definitive of the STCW Convention—a paradigm heavily influenced by competence-based training and requiring specific practical and performance—based outcomes.

However, the STCW Convention has been developed in a context that appears to be insulated from contemporary wider social and educational discourse and change. This is not necessarily a negative, for of necessity, the Convention had to address the specific needs of safe, secure, and environmentally sound ship operation, via competent seafarers. Despite this merit of the Convention, it is noteworthy that alongside this increased emphasis on competence in the international legislation but perhaps independent of it, has come to the increased shortage of seafarers due primarily to significant social change and societal perceptions about seafaring as a career. Similarly, and in parallel to these trends, there has also been the transformation of national MET systems to include education for and award of academic degrees with the inclusion of more university-style education which tends to go beyond the acquisition of specific vocational (task-based skills) to the development of enquiring minds and a more generalist approach. Academic qualifications (degrees) are here contrasted with the vocational competence-based qualifications based on the former's greater emphasis on theorizing, critical analysis and research. As defined in the Oxford dictionary "academic" in its adjectival form relates to "education and scholarship" and places "greater emphasis on reading and study than on technical or practical work".

¹ Article 3

The trend towards university-style education and the developments in lecturer profiles, curricula and resources have not been without challenges. Curriculum design, development, and delivery, as well as the standards required, may be very different for the two approaches (academic and vocational). Using the curriculum component of qualification of instructors as an example, recent research under the auspices of the International Association of Maritime Universities (IAMU) found that there is still a gap between the status quo and what could be considered the ideal where instructors in maritime education and training institutions (METI) bring to the curriculum optimum levels of both academic and certificate of competency related qualifications and experience (Manuel and Nakazawa 2008; Manuel, Nakazawa, and Kreta 2013).

2 Changes in global social dynamics and associated educational norms

According to Malan (2000, 22):

Education is aimed at creating teaching and learning environments *and experiences* that would bring about desired changes in learners, whether to be more knowledgeable, better skilled or to influence their attitudes and values positively. The essence of teaching and learning is to plan teaching events (contents, strategies, etc.) and to ascertain to what extent learners have acquired the intended competences (italicized words added).

It must be noted that education may be a tool for social change or for maintaining the status quo. All education must be contextualized in society (a macro view) and yet examined for its effect on individuals—on their future, the restrictiveness of their choices, and the outcomes that are deemed relevant to their contemporary societies (a micro view). Along with the law and markets, education (as it relates to the establishment of social norms) is a key instrument of social change (Manuel 2011, 214). In seeking to optimize social policy and desired outcomes, legal norms alone are limited and must be augmented by appropriate social norms and market systems as shapers of social behavior (Schuck 2000). As Vago (citing Clinard and Meirer) notes, “there are two basic processes of social control—the internalization of group norms and control through external pressures (*e.g. the law*)” with the former being the consequence of “socialization, the process of learning the rules of behavior for a given social group” (Vago 2012, 194) (italicized words added). A key contribution to this socialization comes from formal education. The role of appropriate education and training in transferring knowledge, maintaining competence, driving necessary change, addressing emerging challenges, and mitigating the negative consequences of previous actions and decisions are imperative and undisputed. With respect to needed social change, whether in a global, industry, or national context, higher education is both the product and source of change (Coiffait 2012). Universities, by their nature, address this social change via “higher education.” While over the years, there have been shifting conceptions of the focus of higher education, one consistent thought has been that it cultivates intellectual prowess and deductive reasoning skills. In the words of one very early inquirer into the essence of the university, “it (the university) contemplates neither moral impression nor mechanical production; it professes to exercise the mind neither in art nor

in duty; its function is intellectual culture; here it may leave its scholars, and it has done its work when it has done as much as this. It educates the intellect to reason well in all matters, to reach out towards truth, and to grasp it" (Newman 1907, 126–127).

In its original religious form therefore, university education (at least in the Western context), as an agent for social change, addressed fundamental issues that could be said to encompass all of human interests and forms of inquiry, ranging from questions about the natural world to those of psyche, existentiality, and being. It was a "liberal education" that focused on the development of the intellect for its own sake. However, those who subscribe to a "philosophy of utility" have always challenged this idea of a university. In recognition of this side of the debate about the essence of a university and as early as 1907, Newman had this to say about those who clamored for evidence of the "utility" of the intellectual education as described above:

Now this is what some great men are very slow to allow; they insist that education should be confined to some particular and narrow end, and should issue in some definite work, which can be weighed and measured. They argue as if every thing, as well as every person, had its price; and that where there has been a great outlay, they have a right to expect a return in kind. This they call making education and instruction "useful," and "utility" becomes their watchword. With a fundamental principle of this nature, they very naturally go on to ask, what there is to show for the expense of a university; what is the real worth in the market of the article called "a liberal education," on the supposition that it does not teach us definitely how to advance our manufactures, or to improve our lands, or to better our civil economy; or again, if it does not at once make this man a lawyer, that an engineer, and that a surgeon; or at least if it does not lead to discoveries in chemistry, astronomy, geology, magnetism, and science of every kind (Newman 1907, 153).

Newman strongly opposes this line of thinking. He says:

This then is how I should solve the fallacy, for so I must call it, by which Locke (*a proponent of the "theory of the utility of education"*) and his disciples would frighten us from cultivating the intellect, under the notion that no education is useful which does not teach us some temporal calling, or some mechanical art, or some physical secret. I say that a cultivated intellect, because it is a good in itself, brings with it a power and a grace to every work and occupation which it undertakes, and enables us to be more useful, and to a greater number. There is a duty we owe to human society as such, to the state to which we belong, to the sphere in which we move, to the individuals towards whom we are variously related, and whom we successively encounter in life; and that philosophical or liberal education, as I have called it, which is the proper function of a university, if it refuses the foremost place to professional interests, does but postpone them to the formation of the citizen, and, while it subserves the larger interests of philanthropy, prepares also for the successful prosecution of those merely personal objects, which at first sight it seems to disparage (Newman 1907, 167) (*italicised words added*).

Despite these strong (and arguably valid) arguments put forward by early scholars like Newman, university education has evolved in a direction that has placed other

goals on an equal footing with the original primary goal of critical intellectualism. Indeed, the continued relevance of the institution of university education may be attributed to its ability to adapt “to succeeding socio-economic orders, to radical shifts in science and intellectual culture”; its continued existence and relevance not only in the West but also globally, is a tribute “not so much to its transcendent virtue but its ceaseless adaptation” (Scott 1993, 4). Similarly, Houston et al. suggest that:

A university is seen from educational, social, political and economic perspectives; from within by academics, students and other internal participants; from outside by employers, citizens, politicians, potential students and a wide diversity of others. The idea of the university seems to be one that is characterised by diversity and variety. Significant tensions can arise from the interplay of different ideas of the university, which draw on contrasting interpretations of its purpose (Houston, Robertson, and Prebble 2008, 209-210).

Today, in an evolving expression of that “diversity and variety,” some of the relatively new defining goals of university education have superseded the original ones and the notion of the “pragmatic utility” of university education arising from stakeholder priorities, is alive and well. This pragmatic utility is evidenced in increasingly, vocationally biased education where universities may work to expand the breadth of knowledge e.g., as it relates to professional knowledge, without questioning contemporary practices via intellectualism.² Universities have come to be not only the centers of higher learning where the status quo is questioned, but also repositories of societal state-of-the-art knowledge whether such knowledge relates to purely “ivory tower” subjects or more industry-related or professional domains. This dual approach is expressed via the existence of many types of universities giving opportunities for further and higher education: traditional universities, colleges, specialist academies, degree awarding polytechnics, etc.

It appears then that the notion of nineteenth and early twentieth century vocational education as distinct from some “ivory tower” intellectualism, is becoming anachronistic. It belonged to a time of distinct class divisions where the existence of a “working class” (the non-intelligentsia) was separate from an elite class of supposed intelligent thinkers (see Bol and van de Werfhorst 2013). A significant percentage of all university degrees today—whether in engineering, medicine, pharmacy, architecture, management, law, human resource management, finance, and maritime affairs—may be said to be “vocationally oriented” in nature, in the sense of addressing the standards, requirements, and goals of specific professions and “industries.” While not arguing that the more purely academic degrees in the arts, humanities, and pure sciences are redundant, in the utilitarian reality of the twenty-first century, vocational and academic approaches in the university context are becoming perhaps only an issue of semantics. Indeed, many universities offer vocation-like courses even for the pure academics and one may venture to say that seafaring has come rather “late to the party” (of the transition of universities from “ivory towers” to “utilitarian academies”). The presence of seafaring as an educational endeavor in a university setting, nevertheless, is as valid as that of medicine, pharmacy, engineering, and any other professional-type endeavor that is

² The utilitarian kind of education does question the status quo but mainly via utilitarian relevance and improvement.

studied in universities today. This acceptance of the importance of utility-focused education is reflected in the literature, with Malan (2000) for example, calling the related approach of outcomes-based education a “new paradigm.”

3 The place of academic education in MET

The basic paradigm underpinning optimum academic education today is the development of a mindset of inquiry whether for professional ends or for pure “ivory tower ends.” In this new university paradigm of merging inquiry and task-focused, outcomes-based educational approaches, learners should be optimally challenged to question the status quo, to develop critical skills that in the main are cognitive while at the same time meeting the demands of specific competences related to specific professional standards. When the former approach of inquiry and of challenging the status quo is in view, academic freedom and research are indispensable. Vocational education, on the other hand, has traditionally focused on the acquisition of practical skills and is more restricted in how it encourages thinking that may be considered as being “out of the box.” Relatively speaking, there is no real academic freedom in dropping an anchor on a very large crude carrier (VLCC) or safely navigating the traffic separation scheme in the English Channel. Successfully carrying out these types of practical activities is dependent on the successful acquisition of a specific set of “toolbox skills” and competencies which, though being quite complex, are not the same as those required for a research-based academic mindset.

Because the maritime industry is part and parcel of a global society that has been marked by remarkable change, it has had to adapt and offer to its trainees this mixed approach to higher education in its specific context. The need to offer this approach is also influenced by the changing perceptions of individual trainees/students (and their sponsors) as to what they want and/or can make out of their lives. It is increasingly uncommon (in many jurisdictions) to find a young person who considers a life at sea as a life-long career. Furthermore, increasing sophistication of technology on ships, greater emphasis on the safety of ships and their crew, and stricter requirements for sustainable environmental practice, all contribute to the need to consider this mixed approach.

It would then appear that the rigid distinction between academic and vocational education is a false dichotomy, at least as it relates to professional maritime work in the twenty-first century that requires life-long learning. To paraphrase Cowling (1998) at length, the perceived differences between vocational and academic education have been exaggerated. If a comparison is made between these educational approaches using Bloom’s taxonomy (whether original or revised), it would be recognized that the fundamental difference between vocational and academic approaches lies in the degree of specificity. Academic inquiry is a generalist approach to critical thinking skills, while vocational education ideally focuses such thinking on more specific professional ends. The basis of critical thinking need not be absent from either one. Any differences in interrogating these approaches should therefore be in respect of the levels (of breadth and depth) at which knowledge and skills are interrogated in both approaches, rather than the isolating of skills for vocational, and knowledge for academics.

This merged approach, which incorporates the possibility of gaining the relevant Certificates of Competency along with academic qualifications, addresses the evolving social and career goals of contemporary seafarers and assures them of the possibility of a long-term career development while addressing industry-level needs.

4 MET challenges and opportunities

The need to “compete” with other potential professions and make a career in the maritime industry attractive to young people has also made it necessary to align maritime education and training to the dominant social trend of degree acquisition. The new paradigm offers to global MET a chance to make it relevant to those who are at the early stage of choosing a career. It allows for an easier migration of seafarer experience and talent to other parts of the maritime industry. At the national level, it has significantly enhanced the exposure and reputation of MET and seafaring as a career option as it aligns more with the main expression of higher education in many jurisdictions. Furthermore, with the enhanced role of technology in the world, such education allows for the industry as a whole to have more versatile professionals in place for future changes in ship operation.

On the other hand, it may be argued that this kind of education may contribute to an increase in seafarer attrition from the operational side of the industry. This argument cannot be sustained as a rationale and basis for restricting the educational options of individuals, consigning them via education to specific stations in life. Such a hegemonic position has a sad global reputation and the discourse about how education has been used to frame class division and advance marginalization cannot be said to be laudable (Ma 2016, Freire 2014). In similar vein, the criticism that this educational approach (that combines vocational and academic work) compromises the quality of seafarers’ competence is one that is best addressed to the specific curricula³ of specific maritime education and training systems and not to the approach in its essence. It is important to recognize these realities i.e., the possibility that the more seafarers are academically educated (and thereby have more options ashore) the more there will be a tendency to leave a sea career, leading to growing numbers of junior officers and fewer and fewer experienced senior officers. However, the global community must seek to solve such problems, not by seeking to have systems that deny potential seafarers an academic education, but by making a career at sea more attractive long-term.

The existence of noticeable merits in the “new” academic paradigm, therefore, does not negate the challenges that it presents. There are challenges related to facets of curriculum design and implementation (including qualifications of instructors, content and the time available, relevant learning activities/teaching methods, availability of capital resources, assessment approaches, and synergies between quality standards systems). As has been previously mentioned, recent research has shown that at least in the area of instructor qualifications, there is a significant gap between the status quo

³ “Curricula” here is taken to refer broadly to the planned response to the issues of “what to teach,” “who to teach,” “how to teach,” “when to teach,” “with what resources to teach,” and “the impact/outcomes of teaching.” It may be said to include all the planned learning opportunities offered to learners by the educational system and institutions and the experiences learners encounter when the curriculum is implemented (Print 1993).

and what could be considered optimal in global MET (Manuel, Nakazawa, and Kreta 2013). One key challenge relates to content vis-à-vis available time. How wide or deep should the content of a curriculum be to make it appropriately academic and at the same time appropriately responsive to the STCW Convention? Who decides this and to the satisfaction of whom? It has been noted that:

Curriculum is a source of influence: it firmly establishes the agenda for students, teachers, parents, employers and other stakeholders who are interested in educational outcomes, providing them with a framework to process its content and the significance of the ideas presented. Stakeholders assume that if students are exposed to a uniform curriculum then they will develop similar perspectives on what knowledge is valuable, adopt a particular hierarchy of the knowledge areas and develop specific conceptions and beliefs about them. Curriculum development is a social debate process that involves different stakeholders in the community at the local, regional and national levels. As curriculum reflects ideological, religious, professional, economic, corporate and academic interests, among others, it can provoke ideological disputes and political strife ... Curriculum decisions define the use of resources: This is best illustrated by the stress placed on the curriculum with the addition of new content, the skills and knowledge areas promoted by different stakeholders, pushing for more classroom time, materials and human resources, and ultimately, searching for social recognition and economic rewards. However, time and space constraints exist, and the financial challenges in many countries are increasingly limiting the possibility of greater education expenditures (United Nations Educational Scientific and Cultural Organization and International Bureau of Education 2013, 24-25)

Given the many possible stakeholders in MET curriculum determination, design, implementation, and evaluation, the global scene has been characterized by quite diverse opinions of what should now constitute optimal seafarer education. There are at present differences (some substantial) between the degree programme syllabi of different METI (see Manuel, Nakazawa, and Kreta 2013 for a listing of some of these within the context of the International Association of Maritime Universities). It does, however, appear that there is some consensus emerging based on comparing, benchmarking, and sharing in contexts such as the IAMU.

5 Proactive and resilient MET for the future

So, what will MET look like in the future with reference to the balance between the academic and vocational approaches and these associated challenges? It is perhaps prudent not to be too predictive or dogmatic in this respect. If there is one area where history should teach us clearly, it is to be hesitant in making predictions, particularly with respect to subject areas that are impacted by technology! It does not take much effort to note contemporary things, processes and developments that perhaps were unimaginable only a couple of decades ago. One would be on much safer grounds if what is put forward are one's own opinions about how MET should look in the future in this specific context. Firstly, it is important that the perceived—and perhaps

imaginary—dichotomy between the academic and vocational approaches to MET be deemphasized. As Robinson puts it, we are no longer in a world of “the intellectual model of the mind” which created a perception of academic (smart) people versus not-too-smart non-academic people (Robinson 2010, October). Global maritime education and training should move beyond that and in some cases has done so.

Secondly, seafarers and their paths to fulfilled life-long learning and the associated evolution of careers within the wider industry and beyond, should not be limited by the interests of any specific stakeholder, which interest, while being perfectly understandable, may be too restrictive and myopic in respect of the individual growth of the seafarer. As the seminal work of Maslow (1943) suggests, all individuals will welcome the achievement of their hierarchical needs and should ideally not be frustrated in doing so, neither by rigid educational systems, nor the restrictive ends of external stakeholders. In similar vein, the unrestricted potential individual contribution of a seafarer to his/her society must be considered important and necessitating the enhancement of his/her education where possible. Again, history has shown that whole groups of people have been controlled, marginalized, manipulated, and exploited because of the systems of education they have been subjected to and the legal norms that supported such education. In the twenty-first century, seafarers must not be one such exploited, marginalized, manipulated, and controlled group.

History, furthermore, suggests that it is not always a good idea to bet against technology; a quick internet search of the most famous predictions that did not come true will confirm this. Even Albert Einstein was reported to have said in 1932 that “there is not the slightest indication that nuclear energy will ever be obtainable. It would mean that the atom would have to be shattered at will” (United States History n.d.). The evolving role of technology may further marginalize the sharp-end (the actual shipboard operational end) need for on-the-job competence. Seafarers being trained today will have to live in a professional world where the skills required may not be as onboard task-oriented as they are today. Expansion of their educational options can be argued to be a good way to ensure that these seafarers are better positioned for a “technological future.”

The question remains as to whether it is desirable, indeed possible, to have global uniformity in curricula that encapsulates both the STCW objectives of a narrow competence-based MET curriculum and the academic inclusions leading to the award of degrees. Despite the factual basis for the trend and the many possible merits, one does not envisage an international body such as the IMO addressing degree-type subjects in the context of the STCW. That could even be an unwelcome development. The discourse on an optimal blend of the competence-based education to specific standards as employed in STCW, and the wider and/or deeper discursive kind of education in standard degree programmes, should be done at the level of nations and regions and in relation to their educational institutions, through interaction between MET institutions and their own national administrations as well as sister institutions, and within that context the sharing of best practices. The International Association of Maritime Universities creates an excellent forum for these kinds of deliberations and exchanges and is well underway with considering such across-board benchmark curricula.

The world, of course, is a very diverse place and there are still many seafarer-supplying contexts that will attract individuals who are not in the least attracted to the evolving academic aspects of MET. The Republic of Croatia seems to recognize this and after decades of offering University degrees in an MET context, now offers an “alternative maritime education system” which allows those who are not inclined to study for academic degrees, the opportunity to work at sea, thus contributing to the mitigation of crew shortage (Frančić, Zec, and Rudan 2011). The two systems, one academic and the other purely vocational run in parallel.

Despite the existence of such systems as is evident in Croatia, one notes, that the global trend towards a more highly academic education and the award of academic degrees is nevertheless real and needs the attention and interrogation of all who have a stake in global MET for the future.

In conclusion, it must be emphasized that the reference to education in this paper is not just to the status quo of education but to a paradigm of education that recognizes the inherent worth of individuals and enables them to develop in a way that gives full expression to their potential. Furthermore, it is recognized that there will be different levels of education and training for the support, operational, and management levels of competency (per the requirements of the STCW Convention). Incorporating academic requirements for the different levels will certainly require different approaches. The specific kind of maritime education and the related curricula elements that will foster a sustainable paradigm of highly competent seafarers, who are optimally equipped with academic qualifications, is the subject of further research.

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