

Instructor criteria for the “New Maritime Community”

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Abstract

Quality assurance in Maritime Education and Training (MET) may be said to rest on three principal elements: 1) the curriculum to be delivered, 2) the methodologies of delivery/assessment and 3) the resources required to achieve desired educational and training objectives. Of paramount interest in the third element is the human resource – in this context, the MET instructor.

The global emphasis on quality in MET has increased significantly in recent times. However, global uniformity regarding desired generic qualifications of the MET Instructor (as an index of quality) is not that obvious. Section A-I/6 of STCW95 requires each party to the convention to “ensure that instructors, supervisors and assessors are appropriately qualified for the particular types and levels of training or assessment of competence”. The notion of “appropriateness” with respect to the technical training required by STCW 95 is arguably easy to arrive at. However “appropriateness”, with respect to the delivery of curricula beyond STCW 95 (a real trend in the maritime community), is much more elusive. In pursuit of what Mr. Yohei Sasakawa calls “the new maritime community”, it is pertinent to raise the issue as to what kind of MET instructor qualifications are “appropriate”.

This paper discusses one tool for institutional self-evaluation, benchmarking and strategic decision-making regarding aggregate MET instructor qualifications and institutional orientation, vision and aims. It further reports findings of an exploratory study (at the World Maritime University) about how a lack of standards of MET instructor criteria detracts from or supports notions of quality in MET.

Introduction

Requirements for mandatory quality standards systems in MET in the STCW 95 Convention and Code (International Maritime Organization [IMO] 2001) have led to a perceptible permeation of a quality culture into maritime education and training institutions globally. This trend is shown quite clearly by the increased institutional subscription to quality assurance/management

systems such as ISO 9001:2000, although this may not have been exactly what was intended by the STCW 95 (IMO 2005). Quality is increasingly acknowledged to be an essential mindset for organizational success in today's world of globalisation and not just an extension of a legislative requirement.

Despite this state of affairs in MET, there are still many appeals for increased quality and the development of systems, procedures, cultures etc. that will create officers for a "new maritime community" (Ho 2004; Sasakawa 2006).

Quality in MET encompasses the concepts of excellence in output, resources, sustainability of product/service and industrial competitiveness, as well as (increasing and important) social and environmental responsibility. According to the ISO 9000:2000 series, quality is "the degree to which a set of inherent characteristics fulfils requirements" (Peach 2003). In this paper we define quality in global MET (limited to the IMO goals of cleaner oceans, safer and secure seas) as the consistent and continual improvement of global standards in all aspects of education and training that equip seafarers in cognitive, behavioural and affective domains to achieve/exceed global requirements/goals regarding safety and security of shipping, protection of the environment and long-term sustainability of efficient maritime transport. This is a step further than the requirements of the STCW 95 requirement for quality standards systems, which it defines as systems that are "able to manage and control all necessary activities and information through a set of documented procedures"(IMO 2005).

In consonance with the given definition, there is a clear need to clarify what global MET seeks to achieve in cognitive, skill and affective terms and in three essential domains:-

The curriculum to be delivered

Methodologies of delivery and assessment, and

The resources (including most importantly, the human resource) required for achieving desired educational and training objectives.

1.1 The prima facie purpose of MET

On the face of it, MET is supposed to produce competent people to operate ships at sea.

Reflecting on the three domains mentioned above, it is noteworthy that there has been significant work done (especially in the context of the IMO) to enable Maritime Education and Training institutions (METI) to meet this goal of producing competent people to operate ships. STCW 95, for example, defines the requirements of competence for being a qualified license holder, which should be clearly reflected in the teaching objectives of related curricula. Further to this, IMO Model Courses provide managers, instructors, assessors and students of maritime education and training institutions with valuable guidelines for course frameworks, teaching syllabi, and teaching/assessment

methodologies. It can be said, therefore, that there have been attempts to significantly address the first two elements, at least at the technical competence level.

However, such attempts are not so evident regarding the third element and particularly the human resource for delivering the curriculum. Though it is acknowledged that there is a clear statement in STCW sections A-I/6 and A-I/8 requiring parties to ensure that “instructors, supervisors and assessors are appropriately qualified”, it is evident that the term “appropriately qualified” is context and time dependent and detracts from gaining a universal standard regarding quality. In contrast to the progress in the development and organisation of technical curricula and the establishment of assessment procedures, issues relating to the qualifications of instructors and assessors at METI (as a global index of quality) seem to have been left behind.

1.2 A more latent purpose of MET

Quality in higher education has been defined, among many other definitions, as “fitness for purpose” (Council for Higher Education Accreditation [CHEA] 2001; Harvey 1995; Harvey and Green 1993). The purpose and quality of MET may be said to go beyond the direct meeting of industry need related to the provision of technically competent ship crew. In light of current trends, one significant purpose of MET should be the holistic development of the human resource employed on ships to facilitate the emergence of clear career paths and options for the trained ship’s officer. Ironically, this shift of focus to the needs of the seafarer rather than the primary competency needs of the shipping industry will in the long term better serve the interest of the industry. Among other benefits, the institutionalization of this shift of focus from purely technical matters will make the industry more attractive to younger people (who will recognise that the education and training they receive gives them options later in life and that they will not necessarily have to be consigned to a life at sea by virtue of a restricted technical education (see e.g. the suggestion of the European Commission 2006)).

There appears to be a real and probably unstoppable trend toward METI offering more than fundamental STCW-based curricula. However it also appears that these “extra-IMO curricula” have been left largely to individual MET institutions. These seem to have no real structured way (as per a globally accepted benchmark) to make the determination as to what is required by global stakeholders as a whole. As a result there are significant variations in what each MET institution considers “appropriate” with such variations evident even among faculty of individual institutions.

When looking at the technical training required by STCW 95, what is “appropriate” regarding instructor/assessor qualifications is arguably easy to arrive at. On the other hand, when other curricula intended to create more rounded maritime officers for a new maritime community are considered,

“appropriateness” becomes a much more elusive concept. This elusiveness is further exacerbated by the fact that the static/reactionary nature of regulation (in this case STCW 95) juxtaposed against the dynamism of context with time (changes of socio-technical, legal, industry practice and curricula needs), creates a tension that is not easily resolved – at least on a global level and that seems to require institutional dynamism not presently in place.

As a result of all this, we consider it appropriate to raise the issue of MET instructor qualifications while maintaining an acknowledgement of the greater importance of developing curricula that comprehensively addresses the needs of a new maritime community.

2 Qualifications and experience of instructors in MET institutions

2.1 Academic and professional careers as experience of instructors

Conceivably, the content/delivery of a subject provided by various instructors will not be exactly the same even if they have the same syllabus, textbooks and teaching facilities. This is because the style of teaching depends not only on the subject area, but importantly also on the processes that the instructor has undergone when obtaining his/her knowledge and skills. Taking, for example, the subject area of diesel engines, one instructor who has mainly gained theoretical knowledge of diesel engines from a designers’ point of view will usually emphasize fundamental performance and the structure of diesel engines in his/her classroom, whereas another who has a long career as a marine engineer may attach greater importance to the know-how of the operation of the marine diesel engine. While it is debatable which of the above backgrounds and styles would be more “appropriate”, it is evident that the instructor, together with his/her background and delivery, does significantly influence the delivery of the formal curriculum as well as the hidden curriculum and by extension the quality of the end product of MET. The hidden curriculum (Jackson 1968), which “includes all of the unrecognized and sometimes unintended knowledge, values, and beliefs that are part of the learning process in schools and classrooms” (Horn 2003) and is influenced by the instructor’s background, may well be fundamentally more important for generating “professionalism” in the mariner than the explicit curriculum.

In general, the complete educational/training package delivered at a maritime institution consists of diverse curricula items provided by instructors with different qualifications. Some curricula items are knowledge-based and others are skill-based. In other words, institutional MET is supported by a team of many specialist instructors with sometimes significantly varying expertise and backgrounds. The number of such specialist instructors can be very high, especially where the education is supposed to lead additionally to the award of an academic degree. The students are consequently exposed to and gain various

forms of knowledge, skills, attitudes and motivation from each of the faculty members with diverse backgrounds. It is reasonable to hypothesize that – allowing for individual personalities and other extraneous factors - the graduating student is a product of the whole course curriculum and its delivery as influenced by the total “summary/aggregate” of the backgrounds of the teaching staff involved in the delivery of the curriculum. This “output” can furthermore be said to be characteristic of the general output and potential of the maritime institution.

2.2 Instructor qualifications/experiences and quality standards and management

As indicated in STCW 95 (e.g. in paragraph 2 of section A-I/8 and paragraph 4 of section B-I/8 of the Code), the qualifications and experience of instructors and assessors are relevant to the attainment of globally accepted quality standards. Various quality assurance systems e.g. ISO 9001:2000 - though not specifically named or required by STCW 95 (IMO 2005) – are in agreement with the STCW 95, with quality-focused human resource management being regarded as an essential requirement (see for example International Organization for Standardization [ISO] 2007). Quality assurance - whether intended to help meet the requirements of STCW 95 or to serve as an inherent institutional value system to meet customer demands - require that all activities be verifiably planned and implemented based on their place vis-à-vis the attainment of stated aims and objectives in a continuous cycle of improvement (Deming 2000). Effective decision-making appropriately based on the implementation of the “plan-do-check/study-act” cycle inherent in all quality management systems requires drawing on valid conclusions derived from real and measurable data and not guess work.

3 Preliminary study

In an earlier paper, an evaluation model/tool aimed at acquiring measurable human-resource related data for evaluation and decision-making was proposed (Nakazawa 2002). In the development of the tool, academic education (AE) and practical training (PT) were selected as two main domains/categories based on a synthesis of the requirements of education and training. These two broad scopes were also chosen because of current trends towards an academic emphasis in course delivery in some institutions; while others retain a practical certificate of competency orientation exclusive to all else. With reference to academic education, academic degree and teaching experience were used as measurable variables. Similarly, certificate of competency and seafaring experience are used for the practical training domain. In all, the variables for evaluation in the tool were:

Academic Degree (AD)

Teaching Experience in MET (TE)
 Certificate of Competency (CC)
 Seagoing Experience (SE).

Using a self-developed quantitative ranking system and formulae derived from calculations for the centre of gravity of plane areas, the tool could be used to evaluate an institution from diagrams such as shown in figure 1.

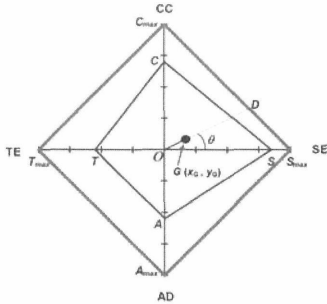


Figure 18: Geometric analysis for institution orientation/disposition

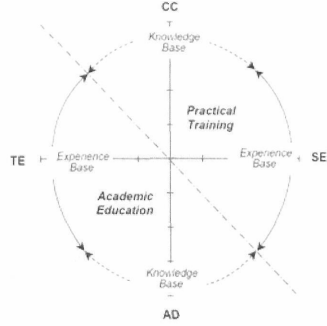


Figure 19: Institutional orientation/disposition

Relevant indices, positions and lengths are obtained from figure 1:

Index P - defined as the ratio of the area enclosed by the blue lines (A), to that enclosed by the red lines (A_{max}) – gives an indication of an institution’s overall potential compared to a theoretical maximum in both academic and practical domains.

The location of the centre of gravity, $G(x_G, y_G)$, of the quadrilateral *CSAT* is the balance point of the aggregate of instructor qualifications. The coordinates at G are x_G and y_G .

The length between the origin O and the centre of gravity G indicates the deviation from the even point where the four variables are completely balanced.

Index D is the ratio of the length between the centre of gravity and the origin, OG , to the maximum length, OD , at the angle θ ,

Finding these details for any institution gives an assessment of institutional orientation based on figure 2 (see Nakazawa 2002 for complete details of the use of this tool).

4 Follow-up study: Global benchmarking

In a follow up to the primary study (and as an exploratory study) we use the principles on which the model is based to suggest a way of finding out the global aggregation of **opinions** regarding the importance of the different variables at any specific time in the maritime industry.

4.1 Methodology

A brief survey was conducted with a limited sample of instructors and management personnel of MET institutions around the world to generate representative results as a reflection of what opinions might exist in a global context. The sample was limited because of the exploratory nature of this study. Invitations were sent out to individuals in various institutions to answer a web-based questionnaire. The institutions were chosen from the IAMU membership as well as from a comprehensive list of Maritime Education and Training Institutions reporting to the IMO and who offer STCW-compliant certificate of competency courses.

In all 68 responses (9 female and 59 male) were received from 37 institutions in 28 countries.

The survey obtained data regarding type of institution the respondent works in, perceived stakeholders, institutional dependence on external policy/legislation/funding and demographics of respondent. Among other questions, the survey asked respondents to rank the variables academic degree (AD), certificate of competency (CC), teaching experience in MET (TE), and seafaring experience (SE) on a scale of 1 to 10 (10 being the most important criteria an instructor should have in meeting the needs of the respondent's institution). Based on the respondents' ranking, quantitative measures were given to the variables.

4.2 Findings

Descriptive statistics for this particular question in the survey are as indicated in table 1.

Table 1: Descriptive statistics for 4 variables

	N	Minimum	Maximum	Mean	Std. Deviation
CC	68	3	10	8.43	1.887
SE	68	1	10	8.22	2.058
AD	68	1	10	8.03	2.233
TE	68	1	10	6.38	2.052
Valid N (listwise)	68				

Respondents to the survey belonged to 4 main types of METI:
 Training institution/college/academy (only for Cert. of Competency)
 University/college/academy (degree awarding to Bachelor's and Cert. of Competency)
 University/college/academy (degree awarding to Master's and Cert. of Competency)
 University/college/academy (degree awarding to PhD and Cert. of Competency)

Of primary interest was the determination of whether the respondents' ranking of the stated variables (treated as a continuous variable) was influenced by the kind of institution to which they belong (treated as a categorical variable). To assess this, a non-parametric statistical test was performed, since the assumptions of normality for the data were not met. The Kruskal-Wallis Test (using SPSS version 16) showed a statistically non-significant difference in all the measured variables across these types of MET institutions (see table 2).

Table 2: Kruskal-Wallis Test results

Test Statistics ^{a, b}				
	AD	CC	TE	SE
Chi-Square	2.265	3.809	0.957	0.019
Df	3	3	3	3
Asymptotic Sig.	0.519	0.283	0.812	0.999

^a *Kruskal Wallis Test*

^b *Grouping Variable: METI type*

This implies that the ranking of importance given to the four different variables by respondents in this sample was not related to the type of METI they belonged to; suggesting that there is currently significant ambiguity across METI types in what is felt to be the most important variable for MET.

To generate calculations based on the tool in the earlier study (Nakazawa 2002), the means in table 1 were multiplied by a factor of 0.4 thus obtaining mean values for the variables from this sample as follows:

CC = 3.4, **SE** = 3.3, **AD** = 3.2 and **TE** = 2.6

These mean values generate a radar diagram as shown in figure 3 which can then be analysed using the formula introduced in the evaluation tool from the preliminary study.

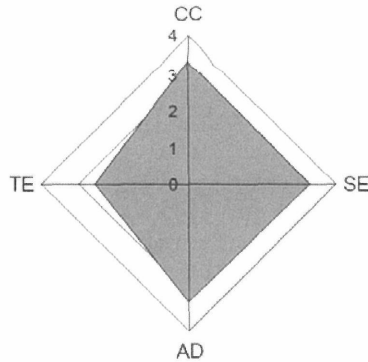


Figure 20: Ranking for variables

We obtain the following results:

$P = 0.608$ (i.e. 60.8 %), $x_G = 0.25$, $y_G = 0.05$, $\theta = 11.0^\circ$, and $D = 0.074$ (i.e. 7.4%). The conclusion drawn is that despite the perceived increase in academic orientation in METI, with regards to qualifications of instructors, the global MET community (as represented by this sample) retains a greater orientation (in opinion) towards practical training than it does towards academic education with about 7% deviation from a perfect balance between the two.

5 Discussion and conclusion

5.1 Purpose and use of the model

Though many international conventions, guidelines and quality standards systems support activities related to quality maritime education and training, the teaching staff, as the most directly involved human resource, exert the most influence on the real quality of a MET institution. The tool introduced here is aimed at better assessing institutional position with respect to this important resource.

It is not the intent of the authors to suggest a tool for ranking maritime institutions. The tool/model is put forward as a suitable means of verifiable self-evaluation regarding the aggregate potential of specific institutions based on the qualifications and experience of the teaching staff. This is beneficial for management, stakeholders and customers alike. The principles on which the model is based also bring the global community one step closer to global benchmarking regarding suitable MET instructor qualifications.

It should be noted that the introduction of the model/tool in the primary study is not intended to be a wholesale endorsement of Quality Management Systems as they are applied today. The merits of the way in which such systems

are applied and their overall effectiveness are debatable (see for example Seddon 2000) and such debate is not the focus of this paper. We only recognize that irrespective of what model of quality management is subscribed to by an institution, decision-making and self-evaluation based on real, measurable data are critical to the progress of an institution. It is to these ends that the tool is introduced.

As mentioned earlier, the index P shows the aggregate potential for MET based on instructor qualifications. Ideally this would be 100%, but achieving this would appear to be utopian. The index number D shows the deviation from the potential even point (perfectly balanced point) of a maritime institution. It is optimum when this is close to zero. However deviations into the first quadrant could be an institutional goal, for example where there is great demand for marine officers and students who do not mind a restricted field of career options (as pertains in some developing countries). Even where there are deviations from the centre, it would seem preferable, optimally, that the angle θ is close to 45 degrees to indicate a perfect balance between a knowledge-based education and an experience-based one.

With respect to human resource management, this model gives indicators for assessing the status quo as well as for strategic recruitment planning to meet needs at all levels (institutional, departmental or even at training course level). If, for a specific institution, department or course, it is intended to emphasize one domain over the other, recruitment policies can be rationally made and defended based on the current location of G . Take the case for example, of an institution which intends to offer more practically oriented training. If the status quo has G located in the third quadrant, the tool will allow for a determination of this and subsequently policy decisions can be made to move G into the first quadrant by attracting and recruiting new instructors with COC, hopefully at the management level, and with significant seafaring experience.

While it is possible for assessments, decision-making and subsequent action to be based on intuition/gut feeling, this evaluation method is considered a better alternative because it comprehensively meets the key elements of a quick, systematic and verifiable approach to strategic planning in human resource management. To quote Deming (1982):

One of the main aims of improvement in quality is to reduce variation of product. The only safe guide to the cause of variation, to detect the existence of a special cause, is use of statistical signals. The naked eye looking at figures is not a safe guide: it is a hazard.

5.2 Bridging international gaps in standards

Arguably no industry is more international in the scope of application of what is learned on the global stage than the maritime industry. What has been referred to as the internationalisation of higher education; “the process of

systematic integration of an international dimension into the teaching, research and public service function of a higher education institution” (Wächter 1999 as cited by Van Damme 2001) is even more pertinent to the maritime industry than to most. In our opinion, significant effort should begin to be placed on the merging of different criteria to determine what it is MET is trying to produce at an international level and the kind of instructor who will facilitate this. In the words of Paine-Clemes (2005): “we must agree on what we are trying to achieve: technical proficiency, cognitive growth, character development, intellectual breadth and depth, or a particular combination thereof”. The WMU exploratory research indicates significant differences in respondent’s opinions about instructor criteria (irrespective of gender, institution, institutional rank, seafaring experience or academic qualifications). We acknowledge that no matter what is agreed to internationally, there is substantial institutional diversity to warrant individual institutions fine -tuning any global parameters. Unequal training does exist in an unequal world (Sampson 2003). The prioritisation of stakeholder needs varies depending on factors such as national policy, the economic state of a country, degree of maritime dependence of the state etc. It can be appreciated that in such a variety of contexts, it is no small task to find a consensus for the criteria of the qualifications and experience required for instructors and assessors at maritime institutions. However it is essential that more detailed global parameters exist beyond the level articulated by such terms as “appropriately qualified” with respect to instructor qualifications.

This is a goal that the global maritime community must attempt to reach considering the global nature of the delivery of shipping services and the key role human resources play in quality achievement in MET. The following quote from Van Damme (2001) is insightful:

From the wandering scholars of late-medieval times...to the emergence of a mass higher education system and the making of a global virtual culture, universities have been related to social and cultural movements which have the ambition in common not to confine themselves to particular spatial boundaries....However...universities are also a product of the modern nation-state”.

This duplicity in the role of and influences on tertiary educational institutions is particularly onerous where maritime education and training is concerned. MET institutions aim at preparing individuals for a very international industry with the highest requirements of multinational and multicultural cooperation at a personal level and further to equip these individuals with the skills, knowledge and behavioural education required for diverse careers beyond a life at sea. The need for better internationalisation is best articulated by Sasakawa (2006): “... in order to solve emerging issues

related to the sea, we need to reform the traditional system of the maritime community, in which each government basically acts as an individual”.

Is this an achievable goal? With respect to global MET instructor criteria, it does seem so. It should be possible to develop at least generic standards that MET institutions can meet with respect to their instructors as a whole and not infer an evaluation of individual instructor competence.

6 Limitations of this study

A pertinent consideration is that evaluating an institution’s human resource is both difficult and sensitive. However, an objective evaluation of any educational institution cannot be achieved without a consideration of academic curricula and teaching staff. In trying to maintain objectivity, the authors recognize that other data should be considered when looking at performance of teaching staff as a whole. We have been careful to indicate that this study is limited to the variables that are deemed relevant to academic and practical training qualifications/experience. We acknowledge other variables that influence performance such as motivation, remuneration, availability of other resources/infrastructure, institutional ability to attract and retain instructors etc. This study does not include these variables.

Similarly the study uses teaching experience and seafaring experience as (*ceteris paribus*) being indicators of proficiency in performance, while acknowledging that teaching experience in years may not be directly proportional to capability in teaching, nor number of years at sea directly proportional to relevant sea experience.

It is also worth noting that the relationship between academic degree and teaching experience is not as strong as that between the possession of a certificate of competency and seagoing experience.

Regarding the exploratory study, even though the sample size of 68 was statistically adequate taken as a whole, the number of responses per institution/country could not be said to be representative enough of the institutions/countries. Accordingly we refrained from drawing conclusions with respect to specific institutions or countries.

7 Further research

The follow-up study was by no means exhaustive being in nature a preliminary, exploratory study to determine the need for a further exhaustive (in scope and depth) study into instructor criteria and quality in MET. It is envisaged that the next stage of this work would consider a much wider sample - covering as much of global MET as possible – and rely on official data retrieved from specific institutions instead of the use of questionnaires directed at individuals, thus shifting the focus from opinions to actual instructor

qualifications. This shift will also remove the element of marked subjectivity evident from ambiguity even among individuals from the same institution when opinions are considered.

The main aim of any such research would be to check for the presence/absence of any relationships between institutional focus of MET and instructor criteria, controlling for factors such as economic positioning and maritime dependence of an institution's host country as well as perceived stakeholders in the institution and their needs. We further anticipate that the substantive study when completed in the future will contribute to the acquisition of an empirical basis for non-legislative global benchmarking with respect to MET instructor qualifications for a new maritime community.

Lastly we note that the grading numbers used for different academic and practical qualifications in the original tool were subjectively generated to achieve an ordinal ranking. Further research will be needed to generate an objective ranking based on empirical data.

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