Towards standardization of seafarers education and training

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Abstract: The shipping industry is the first and largest globalised industry. International seaborne trade is conducted by ships which in most part are manned by international crew. In addition ships offer services around the globe and thus many seafarers operate in waters other than the countries where they were educated, trained and certified. In addition, the crew is required to be trained following the STCW stipulations but application of the curriculum, training period and structure differs among the countries. Thus an interesting situation arises where the crew being certified and trained in one county serves and performs operation and application of his training in another.

The above situation is not in itself problematic. However, the need to assess compliance with the requirements of the STCW Convention (Standards of Training, Certification and Watchkeeping) is increasing. Thus, there is a need for greater standardization in the training processes and education of seafarers. And within this line a methodology should be created for comparing educational and training curricula and duration in order to move to greater standardization that will ultimately allow the quality improvement of the training and education of seafarers.

This paper examines the seafaring training systems in some of the leading maritime countries and in particular Greece, UK, China and Australia. The primary aim of the examination is to set up the basis for a methodology that will allow comparison of delivery of curriculum and training duration thus providing a basis for greater standardisation.

Keywords: Maritime education, Seafaring, STCW convention, training evaluation, standardization

1. Introduction

The shipping industry is the first and largest globalised industry [1]. It has been a globalised industry from the very early years when sea transportation was used for trade among civilisations. In these early years the training of seafarers started from a very early age through on-the-job training schemes and ultimately competence of seafarers was evaluated on the spot by the captain-shipowner.

With the advent of steam propulsion and internal combustion engines, responsibility of seafarers’ training slowly moved from the captain – shipowner to onshore management companies. The new administrative structure no longer had the possibility for on the job training and direct assessment of seafaring skills and competence. The training of seafarers is now being done before boarding the ship to ensure a minimum of skill, competence and certification.

In addition, in the last quarter of the twentieth century international trade grew with unprecedented pace and with it the possible damage and cost of an accident grew substantially. With these two parameters in mind the international community aiming to “promote safety of life and property at sea and the protection of the marine environment” [2] established STCW which came into force in 1984. The Convention was amended in 2010 with the Manila amendments that brought about changes to each chapter of the convention.

The STCW, together with MLC, SOLAS and MARPOL are the 4 pillars of global maritime regulation [3]. However an interesting difference exists. In the case of MLC, SOLAS and MARPOL application conformity of the agreed standards is examined on an ex-ante and ex-post approach. The application
conformity is, or at least should be, monitored ex ante by the flag state and ex post by the Port State Control (PSC). International Registers also apply an ex post and ex ante monitor and examination. The case is different with STCW training courses where curricula offered by Maritime Education & Training (MET) institutions are approved and assessed by the Maritime Administrations of the countries that solely retain the privilege. It remains the ex-ante responsibility of the Maritime Regulator of the country of issue of certificates and of the flag state. This applies even in cases where refreshment of certificates is necessary.

As it is noted by the IMO [4] “The initial approval of a maritime training programme by a Maritime Administration might include assessment of items … in order to ensure that the training institute or training programme meet the appropriate STCW Convention standards:…”

It should be obvious with the above wording that there is considerable scope for diversification among METs and maritime training courses. This diversity is identified by the EU and a relevant policy application is adopted for a thorough enforcement of STCW requirements by all granting nations and thus METs [5]. This led to a list of recognised countries as regards the systems for training and certification of seafarers [6]. The recognition applies as criteria “…the inspection of facilities and procedures to evaluate whether the requirements concerning the standard of competence, the issue and endorsement of certificates and record keeping are fully complied with, and that a quality standards system has been established…” [7]. Therefore the primary focus of evaluation and recognition is on facilities, processes and systems and there is also a provision for assessment of MET. There is not relevant quality evaluation of training courses or providers or of training outcomes.

Indeed, despite the fact that STCW was entered into force almost 40 years now, there is agreement in the industry that considerable differentiation among training providers from different countries exists [8]. This potentially leads to a significant spectrum of differentiation of the training standards and therefore a methodology for assessing the quality of training in various METs is of significant importance.

2. Evaluation Methodology

According to Moss [9] “Programme evaluation is the process of attributing differences between actual and comparative outcomes to program characteristics under different conditions of student characteristics and other intervening influences, and making judgement about the value of the program characteristics”.

This above definition points to two important elements. The first is that evaluation must be comparative. The evaluation process aims at reaching a judgement of the training programme. This requires comparing outcomes with some other set of expected or actual outcomes. In the case of STCW related courses the expected outcome is “competence”. On a country level this training outcome is evaluated and affirmed through the provision of Certificate of Competency by the respective regulatory authority. With this in mind one might adopt a view that evaluation is already in place and from a certain perspective it would be true. Such an approach however would overlook the globalized nature of shipping. And as the shipping industry operates in a global competitive environment the training programs should be evaluated at transnational level aiming to standardization and homogeneous competence of seafarers. It is therefore suggested in our case that a comparative evaluation of STCW courses should be undertaken by evaluating the comparative outcomes of programmes of different countries. However, we also believe that a definition of the concept of “competency” needs to be operationalised. This may prove to be the largest challenge in this undertaking.

The second element of the definition is that any differences in programme outcomes must be attributable to programme characteristics. This task is quite tedious. The final programme outcomes are affected by student characteristics as well as other socio-economic influences rather than only the programme characteristics. Still however tedious the evaluation exercise needs to include the specification of evaluation parameters.
With the above in mind there are two tasks in hand. Identify the program outcomes that will serve as the evaluation criteria. Adopt a measure process for comparative assessment based on the identified criteria.

2.1 Evaluation parameters

The criteria by which instructional programs are to be evaluated must be the outcomes and the products of instruction. Program characteristics cannot be used as evaluative criteria, for, by so doing, we assume, rather than prove, that those characteristics are good. In the case of STCW related training courses the programme content and to some extend characteristics are directly or indirectly determined by the Convention itself and thus some degree of standardisation in curriculum exists. If only for this reason, programme characteristics and content cannot be the basis of comparison but rather programme outcomes must be the focus. By focusing on outcomes rather than processes or delivery methods, METs are able to apply innovative methods [10].

With the above in mind some of the most common criteria for evaluating educational and training results focus on learning outcomes, certification level and employment of graduates.

As far back as 1980 [11] a connection between time spent learning and increased outcome has been shown. Empirical studies indicate correlation between time spent and student’s learning outcome [12]. Most of these studies [13] focus on the increase of learning outcome per increased time per class hour. The principle though is clear. There is a correlation between learning time and cognitive outcomes. Returning to the need for a definition of competence, from this follows that we also need to establish a connection between cognitive outcomes and competence. With that in mind, courses and of course STCW courses that provide ample time to students to absorb the educative content will provide for best learning outcome and will improve seafaring competence. Following this approach it is suggested that the length of academic studies is utilised as an evaluative parameter as increasing the MET learning outcomes is subject to the ample learning time provided by the MET institution.

Furthermore, research [14] shows that returns of individuals increase with higher degree qualification. In fact the higher the educational level the higher the returns and for the UK at least, returns on average of 27% for those completing some sort of Higher Education (HE) than anything else. The findings are consistent. The higher the degree compared to 16 year old school leavers the higher the returns. Educational attainment is rewarded with better employment conditions, higher employability and low unemployment [15], than individuals with lower levels of education. With this point in mind it is suggested that the degree level offered at the end of the training period to seafaring students should be the second evaluative parameter.

The quality and prestige of the degree is a key factor explaining the success to work transition. It has been suggested [16] that quality in higher education is based on three dimensions and specifically academic quality, administrative quality and relationship quality with “customers”. These dimensions are important to measure academic quality but also very difficult to approach. However as suggested above quality of degree will be reflected in the employability and working conditions of graduates. In fact employability will increase or decrease based on perceived degree quality from companies that will evaluate the degree against expected productivity in order to make the hiring decision [17]. Although the literature suggests increased employability with higher degree, the crew market in shipping is globalised [18] and thus country specific employment records could be deceptive. On the other hand expected productivity which as was noted is linked with the degree quality is usually connected with salary rate. Therefore salary differences of equally ranked seafarers based on degree origin should be the third evaluative parameter.

2.2 Measuring Outcomes

The identification of evaluation criteria is one step of the assessment exercise. The adoption of a relevant measurement mechanism is also required and this task is not simple and can sometimes be as
controversial as the choice of evaluation criteria. Nevertheless a proposed measurement mechanism is obviously necessary. The measurement mechanism should be appropriate to aim and the evaluation parameters.

In recent years there is a shift towards multidimensional indicators for measuring effectiveness [19] and composite indicators [20]. This methodology is increasingly applied in Higher Education institutions [21] and thus application to vocational training should be adapted rather than adopted. In any case it has been suggested that application in higher education should made coupled with sensitivity analysis [22].

3. Maritime Education & Training in various countries

With the above notes in mind and in order to obtain differences in processes in MET in various countries a choice of countries and METs was undertaken.

The countries chosen were, China [23], Greece [24], Australia [25] and the UK [26]. The first two were chosen as these countries hold two of the largest fleets [27] and the latter due to being significant destinations of students for seafaring training from other countries. The UK and Australia were also chosen aiming to evaluate whether educational systems with the same origin would produce similar training processes.

From the evaluation of the data researched it turns out that the four chosen METS differ in most of the elements of the training characteristics. Indeed the training processes differ in duration, certification result, sea time and class time, as can be seen in figure 1.

As can be seen in Table 1 the training period until CoC ranges from 144 weeks in Australia to 178 in China. Australia seems to follow the most balanced approach between sea time and lecture based training.

<table>
<thead>
<tr>
<th>Country</th>
<th>GREECE</th>
<th>UK</th>
<th>AUSTRALIA</th>
<th>CHINA</th>
</tr>
</thead>
<tbody>
<tr>
<td>DURATION TO CoC</td>
<td>187</td>
<td>160</td>
<td>144</td>
<td>178</td>
</tr>
<tr>
<td>TOTAL SEA TIME TO CoC</td>
<td>97</td>
<td>82</td>
<td>72</td>
<td>88</td>
</tr>
<tr>
<td>TOTAL LECTURE TIME TO CoC</td>
<td>90</td>
<td>78</td>
<td>72</td>
<td>90</td>
</tr>
<tr>
<td>ACADEMIC QUALIFICATION</td>
<td>Certificate</td>
<td>BSc</td>
<td>BSc</td>
<td>Diploma</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>OPTIONAL ACADEMIC QUALIFICATION</td>
<td>BSc(Hons)</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors’ elaboration with data derived from [9], [10], [11], [12]
Figure 1 Illustration of seafaring training stages at chosen countries. Authors’ elaboration with data derived from [23,24,25,26]
It is interesting to note from the above data that the countries with the largest fleets from the sample support a longer sea training period compared both with the time at class as well as in comparison with the other countries with smaller fleets. This could be the result of the effort of the national training system to provide cadets to the national controlled fleets. It could also be explained from the fact that seafaring students in countries with considerable fleets can actually secure sea time in contrast with the other countries where limited fleets provide limited possibilities of sea time training.

On the other hand, both the UK and Australia provide a Higher Education degree at the end of the process, with the UK granting the higher level degree but also encompassing the longer training period. It should be noted though that the UK delivers a considerable period of blended learning where academic work is integrated with work based training at the last and final year.

With the above notes in mind it may not be difficult to reach the conclusion that maritime training in each country is adapted to the needs of the shipping or training policy of the country. The two countries with significant fleets tend to favour on the job training whereas MET in countries focusing on third party provision focus on degree outcome, see figure 2.

![Figure 2 Duration to CoC for different METs](image)

Source: Authors’ elaboration from Table 1.

4. Conclusion & Discussion

The examination of the Maritime Education and Training institutions’ programmes from four countries revealed that there are differences in duration, certification result, sea time and class time. Indeed it would be rather optimistic to aim for a proposed MET system that would be considered as one size fits all tool. This has not to date been achieved in any educational or training system. It is probably not an aim worth exploring as each training and educational system is adapted to each country’s characteristics. Particularly, it seems that training systems operating in countries with large fleets tend to favour sea training time.

Despite the fact that training systems and programmes are not or should not be aimed to be identical, that shipping is a globalised industry and competence of crew trained and originated in one country might create a risk in another, which requires a higher standardisation of training schemes. With that in
mind it is strongly contented that the evaluation of a maritime training scheme should be comparative and that outcome evaluation should focus on results such as employment of graduates, salaries or degree prestige that tend to be connected with market oriented results. Nevertheless, the evaluation should also be based on a multi-dimensional approach as well and to that end the use of composite indicators is proposed as a methodology for evaluation.

Reference list


