

Maritime education and training system require a change to make a competent seafarer for shipping industry. A case study from an International Maritime institute.

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ABSTRACT

The success of the world's shipping industry ultimately depends on one special group of people: seafarers. These men and women have led humankind in the discovery of the world and changed the global economy. Today, the role of seafarers on board ships has greater importance than ever before and will continue to be key in the coming years. Without motivated, qualified and trained seafarers, the international shipping industry will not thrive. Maritime education and training (MET) is therefore crucial for all parts of the world's maritime community, and particularly for the seafarers of today and tomorrow, as it is the basis of a secure, safe shipping industry. Effective MET for seafarers at various levels provides them with proof of their competence in the particular skills and duties they need to perform on board. However, the effectiveness of MET varies widely, such that having a certificate does not guarantee a seafarer's competency – as demonstrated by the many maritime accidents that continue to occur as a result of human error. Competency must therefore include knowledge and skills, and more importantly, their application in the workplace. This study explores the effectiveness of current MET in developing competency among seafarers. This is achieved by examining and comparing data gathered from interviews with participants with seagoing experience on a competency development course at an international maritime training institute in Australia. The findings of this research show that the participants need more practical studies in their STCW competence development course and different approaches in teaching them. The study concludes by providing a summary of changes to MET on competence developments suggested by the participant interviewees. The findings highlight the importance of teaching practical skills and applying relevant teaching methods to allow seafarers to become competent in the skills they will require in real-life situations. Furthermore, they may serve as an incentive for MET institutions to improve their course content and delivery, as well as for researchers to continue studying this subject further.

1 Introduction

Shipping is still the most important mode of transport for world trade, and seafarers and ships are therefore vital in terms of improving global trade and the global economy. The economy of maritime education and training (MET) is linked to the economy of the shipping industry, whose outlook remains bright. 'We must learn to walk before we can run' is an old saying that

is commonly used in relation to shipping, seafarers and MET. It is a well-known fact that MET has to serve several purposes. Undoubtedly, its main purpose is to produce qualified seafarers for the shipping industry. However, MET today is heavily concentrated on technology rather than on the seafarers themselves. The shipping industry has been developing with the goal of reducing accidents at sea. The aim is that everyone who works on board ships should have proper training and education, not for certification purposes, but for the safety of life and the safety of the environment.

Different countries have their own MET standards within the framework of the single overarching rules and regulations of the International Maritime Organization (IMO). As Koji Sekimizu, Secretary-General of the IMO, said,

“While compliance with standards is essential for those serving on board ships, the skills and competence of seafarers, and indeed, the human element ashore, can only be adequately underpinned, updated and maintained through effective maritime education and training.”

(Sekimizu, 2015)

MET today is guided by the universal Standards in Training, Certification and Watch keeping for Seafarers (STCW) rules. In the 1960s and 1970s, the shipping industry as an active element of global society came under intense pressure following several high-profile shipping accidents that resulted in huge environmental damage (e.g. the Torrey Canyon in 1967). As a result, in 1978 the IMO introduced its first STCW, called STCW78, to set the standards in training for all seafarers. However, this convention proved ineffective (McCarter, 1999), leading to its comprehensive revision on 7 July 1995. Significant amendments introduced in STCW95 include those relating to oversights in training, assessment and certification procedures. Specifically, STCW95 stated that training for seafarers should ensure that they are aware of the hazards of working on a vessel and can respond appropriately in an emergency. However, as noted by Emad and Roth (2008), “after almost two decades of implementation worldwide, the convention was not promoting the changes for which it was initially designed and had not reached its objectives”. In 2010, the IMO adopted new amendments to STCW95 in Manila, called the Manila Amendments. These amendments are necessary to keep training standards in line with new technological and operational requirements that require new on board competencies. IMO also introduced competency-based training as a new method for teaching seafarers.

Despite the introduction of international STCW, many accidents and incidents in the shipping industry are still caused by human error. Modern ships these days are technically very well built and generally well maintained, and so incidents are not generally the result of mechanical malfunction or breakdown, but rather are mainly due to human error. MET therefore has the responsibility of researching the causes of accidents and incidents in shipping industry, thereby creating awareness among seafarers and addressing issues through proper training in their respective competencies. However, despite the introduction of this system, the industry still has problems with human error (Alop, 2004).

This study was designed to find out where there might be problems in MET in the area of competency developments of seafarers. It shows that there are a few contradictions within the system, whereby seafarers pass their competencies without actually being fully competent in terms of their knowledge and skills.

In this research paper I begin by providing a historical background to problems and changes in MET for competency development training. Following a description of the research method, I report on my case study into different components that affect seafarer competency developments in MET, and then proceed to articulate ways in which those components could be improved in order to raise the competency level of seafarers in the required skills. I conclude with suggestions for overall improvements in the competency development sector of MET.

Historical background

Seafarers are recognized as competent when they have enough on board experience at a particular competency level to reach the next level of competency. Competency of seafarers is achieved through thorough practice of skills and knowledge, and by attending competency development courses at MET institutions, where they can gain the skills and knowledge they require to perform on board ships. Although merchant shipping and MET are governed by the IMO, actual standards and practices vary widely between countries and between individual MET institutions (Alop, 2004). But the universal fact remains that MET practices needed to be harmonized under a single standard of certification (Emad & Roth, 2008).

Many investigations into accidents at sea have concluded that poor training and lack of competency were the main cause (Bergetal.2013). The lack of enough skills in demanding situations has been shown to be one major contributing factor in various near misses, delays, incidents and accidents (Kim and Nazir 2016). Reform efforts have therefore focused on MET levels. Additionally, accelerating changes in the shipping industry – both technological and regulatory – necessitate the evolution of MET, specifically by further fostering seafarers' practical skills and proficiency to ensure their better performance at sea. MET for competency development is the process that provides seafarers at both the operational and management levels of the shipping industry with the knowledge, attitude and skills they need to perform their various duties. The influence of the human element is paramount, as it is people who carry out almost all operations in shipping companies, both at sea and on shore. Seafarers must therefore be highly competent, well-motivated and stimulated, with qualifications and support in their areas of professional responsibility. It is in this area that organizations providing MET therefore clearly need to focus.

Standard of competence

Traditionally, competency among seafarers was achieved by gaining adequate experience and acquiring and demonstrating the skills needed for seagoing employment, simply through serving specified periods of time at sea. Knowledge and understanding of subjects relevant to the work involved could be tested adequately through written examinations. A popular theory suggests that a student passes through five distinct learning stages: novice, competence, proficiency, expertise and mastery (Dreyfus, 2004) these methods worked well over the years. Even today, criticism aimed at seafarers responsible for accidents in the shipping industry imply that their performance at the time of the incident was incompetent, not their overall performance.

Within the standards of the modern shipping industry, seafarers must have a clear indication as to the level of competence required. As the basis to this, the development of competency in seafarers must involve making the desired outcomes of the training explicit, in terms of the

standards of each competence level. In addition, the assessment must incorporate the ability to perform to the defined standards and to apply relevant skills and knowledge in practice. Finally, a range of learning opportunities should be open to candidates, which facilitate access to new qualifications and assist their career development and progression. Skills learnt should be tested by both a written examination and an oral exam after the completion of the competency development course in which the seafarer is trained for their next level of competency in preparation for their next role on board. Competence must demonstrate knowledge, skills and the application of these in the workplace. In addition, the decision that someone is competent should mean that a judgement has been made that the person has the ability to continue to perform competently in the future. The standard of competence should ultimately focus on the ability of the candidate to perform effectively. However, effective performance depends on the individual body of knowledge, theory, principles and cognitive skill on which the individual can draw. The ultimate focus on the competency of a seafarer must be effective MET at their particular competency level.

2 Method

The project utilized qualitative semi-structured interviews as the method of data collection, whereby the questions asked during the interviews emerged and developed through the advancement of the process. The oral interviews were recorded digitally and then transcribed by the researcher. As an integral part of the research process. We aimed to protect both researchers and participants by gaining an ethics approval from the Social Sciences Human Research Ethics Committee.

Project title: The effectiveness of Maritime Education system on competency developments of seafarers.

2.1 Research objectives

This study was designed to reveal any problems in competency-based training within the maritime education system and any contradictions in this system that fail to give seafarers the skills they need. The report initially describes previous systems of learning in the maritime industry and the new requirements that were brought into force by the IMO. The research examines considerable features inside a system designed to improve the education and training of mariners. It does not claim that current MET practices are failing, but highlights potential improvements to the system by better education within the maritime industry. The study reveals the potential for poor competency levels among seafarers, which is the main cause of accidents in the industry. As MET is a vast and continuing development process, the maritime industry itself needs to develop continually in order for the industry to grow.

In this project, mariners who are in the process of attempting to meet their competency levels are asked for their suggestions for improvements to MET. These suggestions and other data gathered, along with the final analysis, are provided in the next two chapters of this research paper. The concept of education in general, and of maritime education in particular, has dramatically and comprehensively changed during the era of globalization. This era is controlled by technological revolution and the potency of the education pod, or 'herd', where education is no longer provided solely by education institutions during formal study phases, but rather is seen as a continuous process of learning. Education has become the main drive

behind the development matrix in general, and the development of maritime transport in particular. It is the effective means to equip humans with experiences and capacities in order to hunt employment opportunities, which is the pillar of development.

This research aims to investigate maritime educational perspectives on seafarer competency development. The study also aims to evaluate the effectiveness of MET for the seafarers of today and tomorrow, as competency development is the basis of a safe and secure shipping industry. Moreover, seafarers' perceptions of their role on board ships, along with their maritime educational background and success criteria, are key in the measurement of effectiveness of maritime education. The research will contribute greatly to the benefit of maritime educational providers internationally. The greater demand of skilled mariners with high levels of knowledge and competency justifies the need for more effective system approaches. Thus, results derived from this study will help these institutions maintain the competency required by mariners working on board ships and in the industry generally. For researchers, the study will help to uncover critical areas in the educational process that they may not have been able to explore.

Specifically, this research is guided by the following questions:

- What is the effectiveness of maritime education and training on the competency development of seafarers?
- How does the competency developed in maritime educational institutions relate to real practices on board?
- What improvements could be made to the maritime education system globally?

2.2 The research sample

The researcher interviewed students aged between 27-39 years at International Maritime Domain in Australia with both sea experience on engine side and on deck side. The academic and professional backgrounds of the interviewees varied extensively. Often, the students who appear at international maritime domain for their upgrade of competency are current seafarers in the shipping industry. In contrast, the teaching staff (who also constituted part of this study) have long experience at international maritime domain and have various academic backgrounds. In general, the students (seafarers) showed a great interest in participating in the study.

The analysis of the data originated from transcripts of the interviews, which took place between 1 May to 15 May 2017.

2.3 Procedures

The collection of data for the proposed research occurred via face-to-face interviews with individual students. A semi structured formal interview process was utilized to ensure that the research questions were addressed, while also allowing for emerging and unexpected themes to occur. This interview process was implemented so that the interviewer had the freedom to explore areas beyond those covered in the research questions. Potential participants were given letter of recruitment in their classroom inviting them to take part in the study, along with an information sheet about the project. Interested participants were then asked to respond to the researcher via email. An interview schedule containing open-ended questions was utilized to

ensure some consistency in data collection so that comparative data analysis could be carried out. The interview schedule was sent to all 75 participants one week prior to interview and 21 students got interviewed. As the data started repeating from the previous data from the participants, we stopped interviewing participants. The interviews were conducted at the first-choice public place of the participant or, if the participant agreed, in a silent study room. The interview was conducted for approximately 30-45 minutes for each participant depending upon the length and breadth of the topics covered.

The oral interviews were recorded digitally and field notes were taken by the researcher describing the events and his impressions. Thus, the data more likely to be qualitative were used for analysis. The data obtained from the recorded interviews were transcribed by a pseudonymous method.

2.4 Data analysis

Coding is an appropriate method to use for analyzing the data collected through this research. It uses a content analysis of written materials from personal expressions by the participants and aims to provide an in-depth understanding of a situation.

Content analysis may be used to analyze data gathered from studies of participants and from interviews, including transcripts of interviews. Content analysis measures the semantic content of a message. Its breadth makes it a flexible and wide-ranging tool that may be used as a stand-alone methodology. It is a research technique for the objective systematic description of the manifest content of the interview. It is the message that conveys a multitude of contents even to a single receiver. Content analysis follows a systematic process for coding and drawing inferences from texts. Each unit type is the basis for coding texts into mutually exclusive categories in a search of the meaning. In this research, referential units of the content analysis are words, phrases and sentences, and may refer to or represent objects, events, persons and so forth.

3 Results and Analysis

This research study aims to reveal any potential problems in competency-based training within the maritime education system and any contradictions in this system that fail to give seafarers the skills they need. The study reveals that there are two major problems in current the MET system:

- Lack of sufficient attention to the practical training in competency developments of seafarers.
- The shortcomings of the MET system in terms of professional maritime educators and their teaching.

In Section 3.1, based on the data gathered from the participants of the study, I show that there are contradictions in the practical training in competency developments of seafarers at MET institutes in relation to their role on board ships. This chapter reveals that competent seafarers need more practical training that reflects their purpose on board ships. I do not claim that there is no practical training in MET, but that there should be more practical training for a seafarer's competency. Practical training is restricted to short courses for seafarers, resulting in human error. To eradicate this problem and to maintain safe shipping internationally, more practical training should be incorporated by governments in MET for seafarers at each of their

competency levels. The seafarers who participated in this study felt they were not fully competent at their level because of the missing practical aspect in their competency development course. As a way of addressing what is required to make MET more relevant to their competency, study participants were asked for their suggestions and improvements. Some suggested that the certification authorities and government should focus on preparation of new course structures that have a practical component rather than simply continuing with the old theoretical structure. Students should be able to apply the theories they learn in MET practically to reflect their work on board ships. This new change in practical standards will reflect work standards on board. To achieve this, the IMO and the individual country administrators for MET should change the current competency developments course standards to practical challenging competency development.

In Section 3.2, I analyzed two important issues based on data gathered from the participants: that MET should be student centered, not teacher-centered; and that professional MET teachers must be motivated, dedicated and enthusiastic in order to be effective. This study does not claim that existing methods of MET teaching and the quality of professional maritime educators in the sector cause poor levels of competency. Seafarers obtaining competency in MET believe that professional maritime educators are the main resource of MET institutions. As supported by data gathered in this study and by the research of other authors, student centered classrooms are more effective in teaching practical subjects, by which the teacher does less and the students do more. Furthermore, maritime educators need to change their focus to what the students are doing and how they learn, rather than simply delivering lectures as a stream of PowerPoint slides. Practical skills cannot be taught effectively through lectures; they are learnt through experiences, and thus the job of a maritime educator is to create relevant experiences.

3.1 The importance of practical training in competency developments

To achieve competency, seafarers must acquire knowledge and develop skills, both theoretically and practically, at an MET institution. To be awarded with competence, seafarers should be able to have their skills assessed through oral and theoretical examinations by the recognized national administrator of the IMO. In this section, I look at the division of practical knowledge into skills and competency, and the implication for MET institutions in teaching this.

Practical knowledge and theoretical knowledge for seafarers are interwoven. Usually, seafarers add to their knowledge base by learning skills and refine these as they develop related concepts through practical approaches. This is a common type of study in courses that use simulators. There is a lot of memorizing by rote for the examinations, which does not improve competency levels in seafarers. As mentioned previously, many shipping accidents are caused by poor competency levels of seafarers. STCW has been revised to stipulate that adequate and appropriate training should be provided to seafarers in order to eradicate human error as a cause of shipping accidents. Despite efforts from the bodies governing MET, however, STCW has still not reached its objectives (Chawla, 2006; Wilson, 2007). This study reveals that there is a lack of practical training in STCW competency development courses at MET institutions, and that the study participants were not convinced that the MET they received was of much benefit of them. A typical response to the study question “How do you

measure the competency developments in terms of the seafarer's practical application?"

given by the participant, was that:

"The competency development courses are pretty bad. They are not useful because there are no practical's and they are full of unwanted theory which is not used in ships anymore."

Another study participant, a certified marine engineer aiming to become a second level engineer, expressed his experience of not being fully competent:

"I am not fully competent because there is no practical training for my competency development course."

These comments from experienced mariners attending a prerequisite course for the upgrade of their competency level are not common.

According to Sekimizu (International Maritime Organization, 2015), "Effective standards of training remain the bedrock of a safe and secure shipping industry, which needs to preserve the quality, practical skills and competence of qualified human resources". Of course, it is vitally important to be clear about MET for the competency development of seafarers, for example like concepts as 'unstable' and 'untrustworthy'. The concept 'unstable' can be learned from definitions and theory, which most MET institutions provide for competency development courses. But the concept 'untrustworthy' must be refined by trial and error, with no certainty at the borderline, and with some sort of ideal type with which to compare each case. A competent is one who has the required skills, developed through adequate practice. Learning a skill by theory alone does not provide practical competency.

At sea, competency is more likely to be defined as a capacity to do a job efficiently in any circumstance that is likely to arise. If we focus on competency in terms of practical training, there would surely be a large measure of agreement about collection of skills and underpinning of technical knowledge at a competent level. The need of a ship to work as an operating unit could be agreed on in a large number of respects, especially relating to safe navigation (from a deck point of view). The two concepts of practical and theoretical knowledge will diverge at some point. The captain of a ship will tend to make some allowance for experience, expecting more or less competence from the seafarers under his command according to their age and background, while the administration simply sets a minimum standard for all. Candidates achieve this minimum standard by gaining the relevant certificate, not by demonstrating their knowledge in a practical way. For example, the administration may set a 50% pass mark. This implies that a certificate of competency can be awarded to someone who gets just 50% of exam questions correct simply by memorizing answers by rote. If a seafarer fails at their first attempt, they can then re-sit for the examinations until they get a pass mark. A captain would take this as evidence, if displayed at sea, that they are not competent. This difference reflects the varied competency levels among seafarers. A certified mariner who participated in this study commented on this issue:

"Can you imagine the knowledge levels of fully competent (first attempt pass) and less competent (second or third attempt pass)... working together on a ship resulting so many mishaps?"

A second concept in competence is the practical aspect, which administrator's state is key to competency development. Competency development courses should therefore assess students equally in both theoretical examinations and practical tests. According to the standards of the competency level, each seafarer needs to demonstrate the competencies prescribed in order to

achieve certification. These competencies should be achieved through a combination of education and training, plus practical experience on board ship (International Maritime Organization, 1996). To achieve this, MET generally consists of training of skills through practical short courses, and education of knowledge through theoretical courses. These different types of education and training methods are the most popular in the maritime industry. As discussed previously, maritime administrators set standards of competency at each level, and issue certificates of competency based on the short courses and the theory classes all seafarers must attend and pass exams in. In the following section, I discuss the functions of these short courses and how they affect competency levels.

STCW short courses and STCW competence development courses (practical vs theoretical)

Most of the countries that are party to the IMO's STCW are successfully reaching the organization's objectives in STWC short courses. For every level of certificate of competency there are certain short courses that seafarers must take. These courses, which focus on emergency situations, are mainly hands on and their content is taught by various theoretical and practical methods. Seafarers are generally satisfied with the approach of STCW short courses, where they are assessed by proving their skills. The practical aspect of these courses makes seafarers feel more enthusiastic about their relevancy to practice on board ships. These skills are covered in part by practical training in various types of situations that are encountered on board – for example, firefighting, advanced firefighting, first aid and oil tanker specialization. The IMO stipulates that it is mandatory for all seafarers internationally to be passed as competent in STCW short courses following theoretical and oral examinations.

Although STCW short courses are mandatory for competency assessments, this research study reveals an important aspect of STCW short course structure that needs to be applied to STCW competency development courses for all seafarers. Specifically, STCW competency course examinations and certification criteria are based on the theoretical subject, which students learn during their course and memorize by rote in order to pass their exams: A navigational officer who participated in the study expressed his view about the current situation:

“STCW short courses are really good for seafarers, but the STCW competency development courses for competent seafarers are not up to the mark because of a lack in practical training for competent subjects.”

Seafarers are clearly more motivated by the structure of STCW short courses, and so maritime administrators need to revise STCW competency course structures so that they also contain a practical component, thereby allowing seafarers to become truly competent. STCW competency courses are also long compared with STCW short courses as a certified mariner who took part in the study commented:

“STCW competency development course is a lengthy process where the subject is just 50% used on board ships nowadays.”

Among mariners, STCW short courses are viewed as the best part because of the practical way the courses are taught. Although working on board a ship is a prerequisite under STCW regulations for anyone looking to gain a certificate of competency, the competency levels change as their job on board changes. For example, a third marine engineer who is mainly responsible for generators on board ship would focus on second engineer responsibilities when he attends a competency development course.

Seafarers who participated in this study were very concerned with the need for a practical component in their STCW competency development courses. Practical teaching of subjects at MET institutes should also be regularly revised in line with technical developments in shipping, so that seafarers can benefit from learning new techniques before going back on board. I conclude this section by quoting from a ship's master who participated in this study, and who felt that:

“More simulators have to be developed, especially due to the upcoming ‘Polar Code’. These new adoptions can be handled only by updating and introducing simulator training methods and practical training for STCW competency development courses.”

3.2 Role of professional maritime educator in competency development of a seafarer

In the previous section I discussed the need for practical training in competency development courses. This section looks at the importance of the role of maritime professional educators in seafarer competency development.

Because shipping is a transport industry, it takes a special kind of person with certain qualities to be a professional maritime educator (Lloyd, 2012). Seafarers are increasingly being asked to pay for their own shore-based training, and so want efficient tuition that is directed at helping them pass examinations. This will enable them to earn qualifications and associated higher salaries. A certificate from an institute with an established reputation will also enhance their career prospects. The STCW code requires that all seafarers should be properly qualified for each competency they attain at MET institutions. To enable them to achieve these standards, professional maritime educators should teach the required subjects to the level of the standards. Unfortunately, however, data gathered from participants in this research study indicates that not all MET institutions have educators who are necessarily qualified for this task. A chief navigating officer who took part in the study stated:

“Standards of teachers (maritime educators) are not very good. (Ungratified expression).”

There are few countries in which maritime teaching is considered an attractive profession, both in terms salary and image. It is therefore necessary to improve the qualifications of maritime educators. The main qualifications needed by maritime educators are enthusiasm and motivation, which are discussed further below. Even well-qualified maritime educators are not always fully aware of the context in which they operate and what their contribution to safer shipping and cleaner oceans could be. This report aims to give maritime educators a few ideas on how they could improve their performance by updating and upgrading their qualifications. The seafarers who participated in this research study felt that their own competency was based directly on the competency of the maritime educators who teach them. Indeed, one mariner who took part in the study stated:

“People don't come on board qualified because of the poor standards of teachers (maritime educators) who taught them”.

The basic prerequisites for a prospective maritime educator are shipboard experience and the highest certificate of competency in the deck or engine departments or as a dual-purpose officer, provided he/she is not expected to teach mathematics, electronics, English or other subjects, which do not necessarily require certificates of competency or shipboard experience. In the majority of MET institutions maritime educators have additional academic qualifications such as Master of Science degrees or Master of Business Administration degrees in maritime law,

maritime economics, and naval architecture and so on. IMO model course 6.10 clearly states that the instructor should have a background or experience in teaching or instructional techniques (IMO 2012, p. 54). Nevertheless, many maritime educators lack training and experience in effective teaching methods, even though they may have vast experience on board ships. As a participant in this research put it:

“More trained maritime educators in teaching are needed in MET for competent seafarers. They have an experience on ships like master or chief engineer but the ability to impart their knowledge to students is missing. It is very difficult to understand them.”

Present maritime educators often do not develop their teaching skills or have a positive attitude to lifelong learning. This is a very important point, as marine educators are key to training seafarers in competency in order to reduce the incidence of accidents at sea. Thus maritime educators should possess a special teaching qualification in order to teach their students effectively.

Maritime educator qualifications – enthusiasm and motivation

Bettencourt et al. (1983) carried out research into the effects of teacher enthusiasm on student engagement. The results showed that students in lectures taken by enthusiastic teachers were more engaged and more focused than those in comparison control classes. The positive effects also seemed to go beyond the classroom. Perry and Penner (1990) found similar results, and it has been suggested that teacher enthusiasm leads to increased student motivation both inside and outside the classroom, improving engagement and learner outcomes. With the requirements of STCW on seafarer competency, maritime educators should take a special interest in cultivating competent seafarers. It takes a special teacher to motivate a student by focusing on their skills and abilities. The problem is actually implicit in the MET system. It starts with the IMO, which prescribes the functions and standards of competence that should be attained. Competency development courses are then constrained by boundaries, beyond which it is not cost effective to provide training. The maritime administration infrastructure is therefore against innovation at the teaching level; yet paradoxically the whole maritime industry is alive in new design ideas and innovations. Unless there is a change in the teaching system, seafarers will always lack competency. The outcome, in the maritime education and training that interests seafarers, is usually seen as the willingness of a maritime educator by showing his/her personal qualifications rather than showing their experiences.

Feedback and assessments

It is not just education and training that rely on the idea of memory. A maritime educator is a source of knowledge, a demonstrator of skill and a judge of standards. It is useful here to recall what we understand about assessment. Rowntree (1985) defined it in the following way

“Assessment is an attempt to get to know about the student and find out the nature and quality of his learning – his strengths and weaknesses, or his interests and aversions, or his style of learning.”

From the above definition it can be concluded that assessment is all about knowledge – specifically knowledge about the student. How can that knowledge be interpreted and used? The main purpose of assessment is to provide feedback for students and teachers. However, this is always given a low priority by maritime educators in MET. Seafarers’ perception of assessments has shaped their approach to learning. “The way that the conventional assessment system in use today is not even achieving its claimed objective: assessing the knowledge an

officer needs in board ship to act successfully” (Emad & Roth, 2008). One of the participants in this study stated that:

“Redundant stuff should be omitted and present industry study should be asked in examinations and made to study in course.”

After further discussion with this seafarer about assessments and feedback in the MET system, he said:

“The feedback of delivery and response from students is missing. Teachers should focus more on students. Of course they get feedback from assignments and exams, but there is one more important assessment of students which is missing in MET, i.e. general assessment of students by their skills and ability to focus on subject.”

In some countries, the standards are fully defined and all educators need a special qualification in assessing seafarers before carrying out an oral exam to assess him/her. This process needs to be harmonized across all MET institutes so that all educators give personal feedback to seafarers before they attempt competency examinations. As the seafarer above noted, feedback and general assessment of individual seafarers gives them confidence in their abilities to face the real examination at the first attempt, thereby avoiding a reliance on memorizing information by rote.

Transformation from teacher-centered learning to student-centered learning in MET

According to Halperin (1994), higher education teaching continues to be in the traditional style, whereby “students sit quietly, passively receiving words of wisdom being professed by the lone instructor standing in front of the classes”. As discussed above, professional maritime teachers need to create experiences, which should be delivered in an enthusiastic and motivated way. Felder and Brent (1996) define student-centered learning as a cooperative approach whose pace is dictated by the student and whose content involves active experiences. They stress that students should be given responsibility for their own learning experience, and should be allowed to discuss topics with peers, write essays, and explore different attitudes, values and opinions. This is uncommon in MET, as a chief officer participating in this study noted: “People who teach seafarers are ex seafarers who are not in touch with the new changes in the industry. They may have been teaching for 10 to 20 years but they are not working on ships now. The lessons which they teach are completely different from what is being used currently on board ships.”

There is a need in MET for learning to change from a teacher-centered system to a student-centered one. Changes in the industry – which are updated on board regularly – will then be shared among all the students, as they are current seafarers who are in regular touch with the system. In order to enable maritime lecturers to make this switch from teacher-centered learning to student-centered learning, they should be given regular professional development in teaching and in up-to-date technical expertise. Professional maritime educators should themselves develop their understanding of how people learn, tools to reflect on their teaching practice, and skills to use current technology such as simulators to best effect. Grey’s (2009) comments are particularly relevant here: “it has become clear that at every level across the industry there is a growing dissatisfaction at education and training... devaluated to the lowest common denominators produced by the need for global qualification”. The modern shipping industry, in which crew sizes are being reduced and individual seafarers therefore have greater levels of responsibility, requires an effective MET system. In this critical situation, the

institutes providing MET often look to make money by advertising the industry as one that is highly adventurous. This practice contributes to the majority of low crew motivation towards the industry, as seafarers join it in the belief that they can earn good money with no proper skills. The institutes have to address this challenge in order to achieve a reasonable seafarer attention rate.

It has been long been realized that human performance is the overriding factor determining the safety of the shipping industry. Human error has been found to be the main cause of accidents and incidents at sea – indeed, 80% of accidents in shipping are caused by human error (Fotland, 2004). In order to reduce incidents and accidents in shipping, the best approach is proper and effective maritime education and training for all seafarers worldwide.

4 Discussion and Conclusions

This research paper reveals considerable contradictions inside the MET system in terms of the competency development of seafarers. The study does not claim that these contradictions cause poor competency levels among seafarers, but suggests that if these contradictions are resolved by maritime administrators internationally then there would be little or no human error caused by poor competency. The findings of this research paper contribute a broad view on the effectiveness of MET for the competency development of seafarers, highlighting the main drawbacks in the system. The findings, in combination with reference to relevant literature, indicate the meanings of these drawbacks, proving the inefficiency of the system. Improvements are suggested in parallel. Moreover, the study raises the importance of MET in competency development by considering the views of the participants.

The quality of MET differs significantly across nations. This study suggests that maritime administrators need to redesign competency development courses and programs, harmonizing worldwide so that seafarers are provided with adequate and proper practical training. As a result, mariners would be able to focus more on how to be truly competent rather than targeting competency certificates. Maritime administrators in all national maritime sectors should focus on the MET system by conducting regular audits with the students by testing their practical knowledge. Specific research into training maritime educators would also be beneficial for the system, to make them more effective in teaching competency development courses to seafarers. As a way to find a solution to the incompleteness of competency development courses, I asked the participants in this study for suggestions and improvements to the system. Almost all of them suggested that improvements should mainly come from the administrators of MET to impart more practical training by introducing more simulators and practical's for better understanding of real-life situations. I conclude this research paper by quoting an experienced mariner who participated in this study:

“Without proper training, the job on board ship cannot be done properly. New training requirements should come to have safe shipping... The competence development courses should be more standardized by new practical training and teaching methods instead of following the old practices.”

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