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Upgrading MET instructors : the skills and knowledge enhancement demanded by MET stakeholders

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UPGRADING MET INSTRUCTORS

The SKILLS AND KNOWLEDGE ENHANCEMENT DEMANDED BY MET STAKEHOLDERS

By

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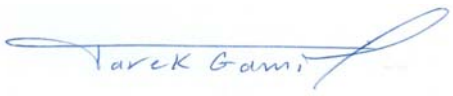
DECLARATION

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the University.

(Signature): 

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ABSTRACT

Title of dissertation: **Upgrading MET Instructors: The Skills and Knowledge Enhancement Demanded by MET Stakeholders**

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The shipping industry demands higher analytical skills, higher qualifications, abilities and competencies. Human resources are critical to the efficiency of this industry. They have heavy responsibilities to ensure the safety of life and property, and the protection of the environment with an aptitude for shipping and other activities associated with shipping. Therefore, MET is a very important part of the chain of the shipping industry and consequently, MET instructors are crucial in the progress of education and training. Attracting, upgrading and the retention of competent MET instructors will raise the skills of future human resources; this is a challenge in the present circumstances.

This research identifies and examines the current global MET situation and the stakeholders thinking with regard to MET instructors. The research was conducted using a review of the literature as well as an empirical study of 88 responses received from maritime administrations, shipping companies, seafarers and MET institutions.

The research outlines the different findings from MET stakeholders and identifies that the majority of respondents are unsatisfied with the current competency level of MET instructors since they held a negative opinion towards MET instructors' knowledge and skills.

This research also identified a diversity of issues that are considered to have a great influence on the improvement of the MET system as a whole and on the MET instructors in particular. It makes subsequent recommendations pertaining to further improve the capability of MET instructors and the future efficacy of global MET.

The research concludes by showing that there is a constant need to ensure that the knowledge and skills of the MET institutions' human resources are constantly enhanced.

KEYWORDS: MET instructors, Upgrading, MET system, Competence, Technology, Legislation, MET stakeholders.

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LIST OF ABBREVIATIONS

ARPA	Automatic Radar Plotting Aids
BSc	Bachelor of Science
CAL	Computer Added Learning
CBT	Computer Based Training
CoC	Certificate of Competency
COLREG	Convention on the International Regulations for Preventing Collisions at Sea
CPD	Continuing Professional Development
CSO	Company Security Officer
DCEs	Dangerous Cargo Endorsements
DGPS	Differential Global Positioning System
DL	Distance Learning
GLOBALMET	Global Maritime Education and Training Association
GPS	Global Positioning System
ICDL	International Computer Driving License
ICT	Information and Communication Technology
IMarEST	Institute of Marine Engineering, Science and Technology
IMO	International Maritime Organization
ISC	Integrated Simulation Centre
ISF	International Shipping Federation
ISM	International Safety Management Code
ISPS	International Ship and Port Facility Security Code
IT	Information Technology
ITV	Interview Television
LANs	Local Area Networks
LNG	Liquefied Natural Gas

LPG	Liquefied Petroleum Gas
MARPOL	International Convention for the Prevention of Pollution from Ships
MET	Maritime Education and Training
METHAR	Harmonization of European MET Schemes
METNET	Thematic Network on Maritime Education, Training and Mobility of Seafarers
MSc	Master of Science
MT	Maritime Training
PDC	Professional Development Course
PFSO	Port Facility Security Officer
QA	Quality Assurance
QAA	Quality Assurance Agency
QCA	Qualifications and Curriculum Authority
QSS	Quality Standards System
RADAR	Radio Detection and Ranging
SMCP	Standard Marine Communication Phrases
SMNV	Standard Marine Navigational Vocabulary
SMS	Safety Management System
SOLAS	International Convention for the Safety of Life at Sea
SSO	Ship Security Officer
STCW	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers
STCW 78/95	STCW 78 Convention as amended
STW	Standards of Training and Watchkeeping
TOFEL	Test of English as a Foreign Language
USCG	United States Coast Guard
USDLA	United States Distance Learning Association

WANs	Wide Area Networks
WMU	World Maritime University
www	World Wide Web

CHAPTER ONE

1. INTRODUCTION

Several maritime disasters analyses have drawn attention to human errors as the main cause of maritime accidents. These analyses have clarified that not only the Master and the crew were responsible, but also maritime education and training (MET) institutions and people ashore share the responsibility. According to Alop (2004, p. 5), “The problem is in the main link of chain and unfortunately in the same time in the weakest one – in people”. Apparently, MET institutions are directly responsible for the proper competence of Masters and duty officers and proper MET might constitute one of the most important risk reduction measures.

Given that ships and equipment are only as good as the persons operating them, attention has also been focused on the standards of education and training of the personnel. Since the 1980s the International Maritime Organization (IMO) has increasingly addressed the people involved in shipping in its work. According to Mitropoulos (2004):

> IMO's commitment to consideration of the human element in shipping runs deep and can be found today in almost all the work the Organization undertakes. Indeed, in defining its objectives for the current decade, IMO took the conscious decision to focus attention on shifting the emphasis onto people.

Shipping is an international industry; the word “industry” includes a broad spectrum of clients such as maritime administrations, shipping companies, MET institutions, and so forth. The industry needs capable people with an aptitude for shipping and other activities associated with shipping; therefore, MET is a very important link in the chain of the shipping industry. MET institutions need to have, in addition to at least the minimum teaching facilities and simulator installations, high quality instructors, supervisors and assessors.

A MET instructor is qualified to teach a number of shipboard-related subjects to students at competency courses. The basic prerequisite for the instructors is appropriate shipboard experience (Zade, 1997). They should appropriately qualify for the particular types and levels of training or assessment of competence of seafarers. Continuously improving the competency of the instructors will naturally raise the skills of future seafarers.

1.1. Maritime Industry Human Resources

According to Horck (2004, p.16), “The industry should be focusing more on the human element rather than spending lot of money on bridge layout and increased automation.” because the human contribution in the maritime industry plays vital role not only onboard ships but also in all shipping activities. Human resources are the crucial factor to ensure the satisfaction and success of final achievements. People having knowledge, skills and competency provide the cohesion between industry and the continuous developments in technology and the legislation. The maritime industry, which strongly depends on highly qualified human resources, is dynamic by nature, for which reason it depends on a global regulatory system.

Maritime industry stakeholders need uniformly highly qualified and competent personnel. As a result, the maritime industry needs to upgrade their human resources in order to properly implement international legislation and keep pace with advanced technologies on board vessels as well as in their design and operation.

1.2. Education and Training

Er, Bayulken, Yilmaz, and Oney (2001, p. 70) have defined MET as “ A set of independent processes such as teaching, learning, researching and resources including human, material and information that function harmoniously to achieve specified

educational objectives in the means of ensuring marine safety and the protection of environment."

It is important to distinguish education from training. Generally, education means the preparation for careers and for life in general, which involves the learning concepts, principles, and so forth. Education as a process involves teaching and learning. According to Cole (1997, p. 260) "Learning is a complex process of acquiring knowledge, understanding, skills and values in order to be able to adapt to the environment." The process depends mainly on the teaching skills of those attempting to assist our learning.

On the other hand, training means the preparation for a specific job or set of tasks. The content of a training course is consequently more specialized than an educational programme. The main areas in which training can operate are knowledge, skills, techniques, attitudes and experience. Basically, training involves learning designed to change the performance of people doing jobs (IMO, 1991).

IMO has given the highest priority to enhancing MET capabilities through the provisions or improvement of MET facilities at the national and regional levels. IMO has also established the World Maritime University (WMU) to provide postgraduate training for senior personnel in maritime training institutions. This is why the WMU MET course should have high priorities within the WMU programme. Obviously, the proper cooperation between IMO and maritime industry stakeholders can enhance the efficiency of this industry.

Generally, MET has a great influence on skills and competence of maritime human resources. Continuous appropriate efforts need to be made by all MET stakeholders, i.e. MET institutions, maritime research institutions, shipowners' associations, seafarers' unions, maritime education administrations, professional associations and governmental

administration of MET to reconcile any shipping industry needs. Therefore, the MET as one stakeholder should be at the core and linked with all the other stakeholders to achieve these needs.

1.3. Internal and External Elements

Alexandrdov (1999) has identified four internal elements considered to affect the quality of any national MET systems: Object (students and trainees), subject (academic staff) of the education, facilities (i.e. library, simulators and programmes) and appropriate institutional management. Generally, the academic staff is the main assets in any MET institution. A better quality of the academic staff can lead to the qualitative enhancement of the other three elements and particularly of graduate students.

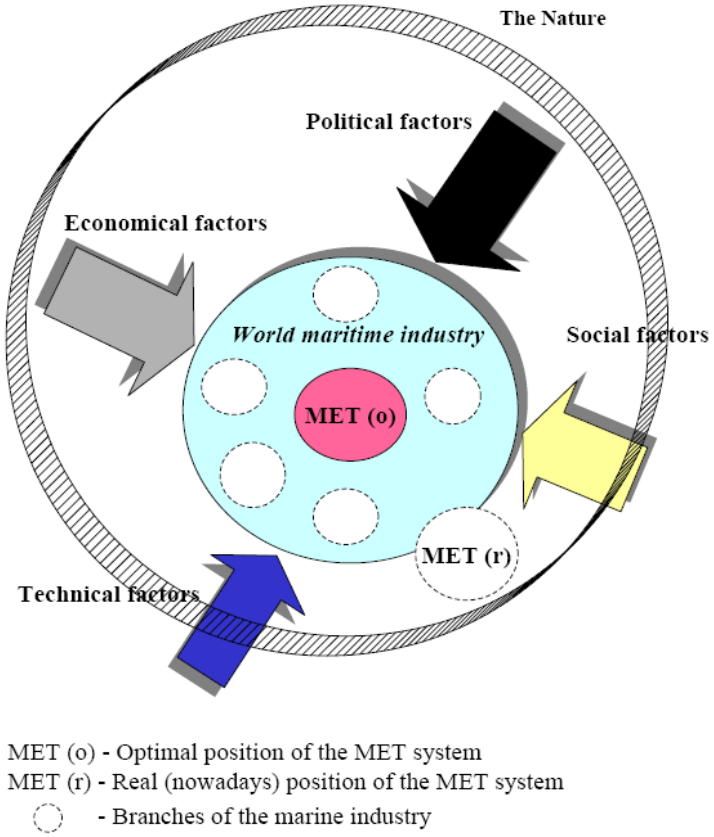


Figure 1: Factors influencing MET system
Source: Alexandrov, 1999

Furthermore, the external environments that have enormous influences on MET systems are economical (industry), political (regulations), social (individuals) and technical (Alexandrov, 1999). Figure 1 shows the external environment where any maritime industry and MET system operate.

Obviously, the core relationships between MET systems and the four external environmental elements depend on the programmes and the academic staff. The academic staff remains the "change agents" and programmes are their main tool to ensure the sustainable development of MET system. Sustainable development means the integration of development and environment, in a context of an education and training system (Borgese, 2002).

1.4. Quality Improvement of MET

The world fleet of high-value ships such as product oil, chemical, Liquefied Natural Gas (LNG) and Liquefied Petroleum Gas (LPG) tankers has grown and continues to grow significantly. Many new technologies will be applied on these ships. Such advancements and equipment innovations call for high-quality crew with specialized knowledge and skills, which in turn place a high requirement on the MET instructors. To ensure that seafarers are appropriately trained to operate highly technological ships in a safe and efficient manner, they must have access to satisfactory levels of updated training. Developing an internationally recognised system of training and certification for officers responsible for the sophisticated electronics equipment and systems onboard ships has become essential in order to improve effectiveness and efficiency onboard ships (Dickinson, 2008).

The need to upgrade global MET has arisen from the consequences of the imperfect match of objectives and realities between MET and the advanced development of the shipping industry. To illustrate, the development of computer pedagogic is not matched

by the increased use of computers and application software. Improving MET quality will help to increase the value of ship officers and ex-ship officers in the maritime labour market and increase the potential international mobility of them; moreover, it will make the shipping industry safer, more environment-friendly and more efficient (Zade & Pourzanjani, 2004). MET institutions need to constantly adapt themselves to face new technological and legislative challenges.

The rapid development of new ship types and the wide application of Information Technology (IT) in shipping operations have required the operators, both on board and at MET institutions, to be very well trained in computing techniques. In addition, the frequent amendments of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978 necessitate the continual improvement of MET.

The instructors at MET institutions need to keep themselves up-to-date regarding developments on board ships and in different shipping industry activities. MET instructors are required to properly respond to new legislation and to technological changes. In order to update all MET curricula, there still needs to be developed an appropriate response to the International Safety Management (ISM) Code, International Ship and Port Facility Security (ISPS) Code, STCW 78 Convention as amended (hereinafter referred to as STCW 78/95) and other national and international regulations.

In some countries the MET objective is higher than the requirements of international regulations. For example, the Thematic Network on Maritime Education, Training and Mobility of Seafarers (METNET) project developed and used the four Es concept (Dinu & Stanca, 2004) of MET for ship officers to facilitate international communication within MET systems, programmes and standards. This communication is necessary to provide a connection between national MET and the international labour market for maritime personnel.

The four Es concept stands for:

1. Essentials (programs satisfying minimum requirements of the STCW 78/95).
2. Extension (shipboard qualifications beyond those of STCW 78/95).
3. Enrichment (additional qualifications which prepare for a career in the shore-based maritime industry, Bachelor of Science [BSc] degree).
4. Elevation (improvement of previous three Es, Master of Science [MSc] degree for holders of BSc degrees and unlimited certificates of competency).

Moreover, in addition to a professional certificate of competency, the tendency to integrate maritime training into national schemes of further education at maritime universities will provide seafarers with an opportunity to obtain an academic degree. In most countries, MET institutions have two supervision parties with different obligations:

1. The education authority, which is responsible to ensure that the conditions for the award of an academic degree are fulfilled;
2. The maritime authority, which is responsible to ensure that MET programmes comply with the requirements of national and international regulations.

These requirements of education and maritime authorities will lead to a further need to develop MET instructors (Alexandrov, 1999).

1.5. The Need for Upgrading Skills and Knowledge of MET Instructors

The STCW 78/95 Convention emphasises the acquisition of skills, practical ability and capability; furthermore, it ensures or monitors the quality of MET. As stated in STCW 78/95 section A-1/6 paragraph 3, “Each Party shall ensure that instructors, supervisors and assessors are appropriately qualified for the particular types and levels of training or assessment of competence of seafarers either on board or ashore.” What is not defined is what it means to be “appropriately qualified.” It leaves to each party to determine the requirements of the qualification. As a result, these requirements could vary from country to country and also from institution to institution.

Furthermore, instructors, supervisors and assessors who are appropriately qualified need to keep upgrading and updating themselves to follow the development race in all aspects in the maritime field so as to be appropriately qualified tomorrow. The key to having better MET instructors lies in having individual efforts from MET instructors supported by a positive institutional attitude.

1.6. Purpose of the Research

To ensure improved capacity building for MET instructors, the main stakeholders concerned with the maritime education and training (IMO, maritime administrations, shipping companies, seafarers and MET institutions) must be involved. While they might not have identical views about what constitutes "appropriately qualified" instructors or how to build this capacity; this capacity must be constantly consulted and their views and recommendations analyzed in order to improve the efficiency and effectiveness of this industry. In order to address this gap, these views formed the data base for my research.

The following objectives have been established for this research:

1 To provide a literature background of the current situation of education and training with an indication to STCW 78/95.
2 To draw attention to the importance of human resources in MET.
3 To identify and examine stakeholders' thinking about MET instructors.
4 To develop recommendations and a conclusion to improve safety of shipping through the upgrading and standardisation of capabilities of MET instructors, supervisors and assessors.

Briefly stated, this research aimed to identify, assess and analyze the current quality of the MET system and in particular the quality of the MET instructors worldwide and to examine the needs of MET stakeholders for upgrading the knowledge and skills of MET instructors.

This dissertation is organised in the following way: Chapter Two presents the development of MET. Chapter Three discusses the impact of international legislation and new technologies on MET. Chapter Four presents the research methodology and process. Chapter Five presents research findings. Chapter Six contains the analysis and discussions of the data presented in Chapter Five. Chapter Seven presents limitations of the research, offers recommendations to enhance the skills and knowledge of MET instructors, suggests avenues for future research, and finally, draws conclusions.

CHAPTER TWO

2. MET DEVELOPMENT

Progress in technology has facilitated the building of highly specialized and sophisticated ships and changed its operation, while advanced shipboard navigation system and engine automation has led to the crucial demands of highly competent, qualified seafarers with specialized skills (Prasad, 1999). Officers need to be trained how to manage a ship equipped with the latest innovations of automation. Of course, new technologies change the perception of education and training, the way people think, how people communicate, and the students' demands.

In the era of information, with increased students' demands, the traditional way of learning is not sufficient. The changes of officers' education, training and duties are mostly connected with the application of new equipment and software on board ships. The training of seafarers has become more technical in content and must be based on a better general education in science (Cop, 2007).

Fifty years ago, MET used to be Maritime Training (MT). Further, it was training confined to shipboard work. MT, a "need to know", began to leave its fringe position of national professional education and training systems and move towards integration in the national higher education system in many countries. This change was mainly driven by MET institutions and shipping companies seeking better qualified personnel for more high-tech ships (Zade & Pourzanjani, 2004).

MET is normally focused on providing technical experts by offering subjects which deal with techniques to make maximum use of knowledge and competence; as well as, high quality seafarers, capable of working on board modern ships and also able to take up onshore occupations after a reasonable number of years at sea. Nevertheless, there is an absence in syllabi for subjects such as presentation skills, administrative skills,

performance evaluation of personnel, negotiation techniques, team work and other methodologies which help to make a ship officer into a good team leader on board as well as ashore (Zade, 2003).

2.1. MET Institutions

In order to adapt to the new industry's requirements, the development of merchant marine officers' education and training has to comply with the new legislation and keep pace with technological changes. Changes are necessary in:

1. Teaching programmes, new equipment, updated and upgraded instructors.
2. The uses of different types of simulators which can enhance the practical skills.
3. Implementation of new methods and tools for education and training, such as: Distance Learning (DL), Computer Added Learning (CAL) and Computer Based Training (CBT) and the use of different types of multi-media equipment.

The main advantages of these changes are improvement in the quality of learning, the increased access to education and training and the cost-effectiveness of education. A MET institution has to ensure that its graduates have maximum market value in the maritime sector, are enabled for, and committed to, life-long learning and should, consequently, have minimal difficulties to find employment (Zade, 2003).

A MET institution's internal and external environment may possibly influence the design and delivery of courses. Moreover, the nature of the learning environment in and outside MET institutions, such as the students' previous knowledge and skills, has a great impact on the national MET system as a whole.

2.1.1. Human Resources

Expertise and high quality manpower are two of the main assets of any MET institution. MET institutions need to ensure that their instructors, supervisors and assessors are appropriately qualified in accordance with the provisions of section A-I/6 of STCW.

The main concern of MET institutions is the instructor's background, qualifications, experiences and any special strengths or weaknesses when recruiting and assigning them to teach, and to help in implementing their designed courses. One of the main weaknesses in implementing effectively the new competency standards in compliance with STCW 78/95 globally on MET institutions has resulted from a lack of teaching personnel trained in instructional techniques (Fisher & Muirhead, 2005). The development of MET instructors will be discussed later.

2.1.2. Syllabi

Normally, the management of MET institutions, supported by appropriate instructors, take an interest in adapting syllabi. MET syllabi validation and integration with technological and legislative changes make it necessary to review the existing syllabi and adjust the time allocation to subjects. Consequently, possible gains in time from subjects which have become less important, or even obsolete, can be allocated to subjects that need more attention or even new. As an example, the assigned time for celestial navigation could be decreased and the time allocated for instructions in the handling of navigation aids could be increased.

During the last decade, considerable syllabi contents changes have taken place. Today the syllabi of merchant marine officer contain more technical subjects which are supported by science subjects and Maritime English, with the extension of syllabi for merchant marine officer training. This training has to be based on a better general education in science. In addition to that, subjects relevant to efficient management, such as maritime economics, law and logistics. Such changes will enhance an officer's knowledge, will help to broaden the general view of students, and will facilitate a job transfer from ship to shore (Prasad, 2004). Consequently, MET institutions need to have instructors capable of teaching the required subjects at the level of STCW 78/95 standards.

2.1.3. Quality Standards System

According to Dinu & Stanca (2004, p. 92), “The quality standards represent a part of educational globalization. Maritime education and training, with its pronounced global character, have made an important step in this direction. Maritime Universities have to continue to improve their quality management systems.”

The self-monitoring of quality assurance systems should mean that MET institutions will continue to evolve (Fisher & Muirhead, 2005). Similarly, for Er et al.(2001, p.69), “Quality assurance of a MET institutions becomes much more complicated when safety, environment and quality management criteria need to be integrated into the existing dynamic processes of a training institution while defining the knowledge, understanding, skills and competence.”

In this context, the recent attention of the international maritime community has been directed towards establishing regulatory regimes, namely the STCW 78/95 Convention, and the ISM Code which is the legal instrument that is most closely connected to STCW 78/95. The purpose of both is to achieve safety of operations through emphasis on the quality of shipboard operations.

The STCW 78/95 Convention made mandatory a quality standards system to cover all MET activities. Regulation I/8 of the STCW 78/95 requires from each party to ensure that all training, assessment of competence, certification activities, and so forth, are continuously monitored within the framework of a quality standard system to ensure the achievement of defined objectives. Regulation I/6 requires all training and assessments to be structured in accordance with the documented programmes and procedures necessary to achieve the prescribed standard of competence and conducted and supervised by persons qualified in accordance with the Convention (IMO, 2001[a]).

MET institutions are required to carry out their programmes through quality standards located within the framework of the national quality standards system. The quality assurance of the education process and the assessment of students are the key factor to satisfy the shipping companies and other parties in today's world. The success of the students is an indicator of the quality assurance of the curriculum of the maritime studies programme. In general, they are the deciding factors in forming an opinion of an educational institution (Cop, 2007).

Establishing a quality culture has a great importance for MET institutions when carrying out constant improvement. The quality culture requires the existence of an environment for a quality management system. The improvement of both the instructors and students can be achieved by a proper implementation of a quality assurance. The management of a MET institution must have a system where the work of the quality management system could be reviewed to take suitable measures for improving MET. Consequently, MET instructors will be willing to keep themselves up-to-date and to attain additional professional and pedagogical education (Peiting, 2006).

Although maritime education, training and certification systems are not directly covered under the purview of the ISM Code, ship operators must be trained and developed in training institutions having a consistency of standards and a reliability of product. The ISM Code in itself is a quality management system applicable to companies and their ships (Prasad, 2004).

2.1.4. Institutions' Teaching Technologies

Generally, technologies are just tools, or means to come closer to sustainable development in education and training. Yet more than skills are required to enhance the current and future requirements of human capacity building (Borgese, 2002). MET institutions need to become effective agents for the proper handling of advanced technologies.

Fisher & Muirhead (2005, p.188) call attention to the effects on personnel: “Careful consideration needs to be given to the impact on human resources when expanding education and training activities into the field of simulator training, creating computer based networks and developing outreach through distance learning.” The optimum utilization of modern technology for teaching and assessment, such as the effective use of simulators, plays a crucial role in enhancing education and training. MET institutions need to encourage their instructors to familiarize themselves with and properly gain the new opportunities offered by CAL and CBT, the use of multi-media and the World Wide Web (www), and prepare themselves for future use of the interactive cyberspace medium. Updated and upgraded instructors being able to use modern Information and Communication Technology (ICT), particularly distance learning materials, will help to graduate better qualified students.

2.1.5. Syllabus Integration with Safety Culture and Environmental Protection Awareness

It is crucial to include safety culture and environmental protection awareness in all education and training at MET institutions. Integrating them into all syllabi offered and developed by MET institutions will give strength and development of commitment to safety and environment. Consequently, MET instructors need to extend their treatment of these topics. Manuel (2005, p. 261) emphasizes just how vital this is: “Beyond knowledge, skill acquisition and ‘simple’ compliance with the regulatory requirements…, education and training needs to ‘grow’ the kind of officer who is suitable for a diverse, dynamic and challenging industry. Knowledge and skills alone can never guarantee performance.”

Proper cooperation between MET institutions as well as other maritime industry stakeholders to survey, review, develop and continuously promote safety culture and environmental protection awareness needs to become an integral and ingrained part of

maritime operations. Hopefully, appropriate safety culture and environmental awareness training philosophies and programmes can build a safety culture and environmental awareness as the main basis to create a positive attitude towards the maritime industry (Zade & Pourzanjani, 2004).

2.2. MET Instructors

The MET system is characterized by four elements: Students, academic staff, programmes and facilities. Obviously, a better quality of MET graduate students is a consequence of a quality enhancement of the other three elements. Education is a process whereby information is exchanged between the student and academic staff. The MET system provides specialists who can work in shipping operations, the shipbuilding industry and other maritime industry activities. The development of the industry as a whole depends on the MET system and precisely, on the MET instructor's development (Alexandrov, 1999).

The MET institutions' future performance can be predictable by knowing the ability and the experience of the individuals in that institution. To be able to achieve a continuous progress in MET; human resource development is one of the most important contributors. Generally, people are inherently flexible and adaptable, but at the same time, they can be very sensitive to change (Taleb, 1999). MET institutional management needs to motivate instructors to improve themselves not only because they have to, but also because they have to really feel committed and believe in it.

Continued Professional Development (CPD) is defined by the Institute of Marine Engineering, Science and Technology (IMarEST) in 2008 as "the systematic maintenance improvement and broadening of knowledge and skill and the development of personal qualities necessary for the execution of professional duties throughout working life." CPD includes updating the particular area of competence, development of

management skills, increase of experience and improvement of personal proficiencies (Parker, 1997). Instructors and assessors, when they accept CPD, will be a major key of success to themselves and for their institutions. It is essential for MET instructors to maintain high levels of professional competence by continually upgrading their skills and knowledge.

Implementation of IMO standards on a global basis need to be supported by a core of well-qualified and trained professionals. The major objective of the STCW is to improve both the quality of training and the assessment. This will not be achieved without highly skilled instructors and assessors. Parties to the STCW Convention should ensure that all those involved in the training and assessment of seafarers are in compliance with the provisions of section A-I/6 of the STCW Code.

To understand how the requirements of the STCW have to be implemented, MET instructors and others involved in maritime education and training activities need to be aware of fundamental pedagogical knowledge, practical teaching skills and advanced technology. They need to enhance their knowledge and skills which include training awareness, substantive technical knowledge, training skills, managerial skills and attitudes to cope with the demands for new training and assessment methodologies.

2.2.1. IMO Model Courses

IMO has developed a series of model courses to help MET institutions and their instructors towards improve the quality of their courses and enhance their effectiveness in meeting international and national requirements. These courses will improve the quality of MET, harmonize the curricula, facilitate access to the knowledge and skills and extend the applicability of MET. They are also to serve as examples and an impetus for a critical review of existing programmes at MET institutions and their updating.

> The purpose of the IMO model courses is to assist maritime training institutes and their teaching staff in organizing and introducing new training courses, or in enhancing, updating or supplementing existing training material where the quality and effectiveness of the training courses may thereby be improved (IMO, 1991, p. 1).

Moreover, IMO model courses help to increase attention to both the industry's and the individual's expectations and needs. They assist maritime training institutions and their instructors in organizing and introducing new training courses or enhancing, updating and supplementing existing training material. Each model course package contains references and guidelines to the instructors, which will assist them to conduct the course (IMO, 2001[b]). Further, IMO has produced a booklet entitled *Guidance on the Implementation of IMO Model Courses*, which deals with the key to successful implementation of the courses.

IMO provides guidance on fundamental instructional techniques, course management and an opportunity to experience various training techniques in the model course, *Training Course for Instructors*, No. 6.09. This model course, however, does not teach trainee instructors about the conduct of official assessments of seafarers' competence. A separate IMO model course, *Assessment, Examination and Certification of Seafarers*, No. 3.12, addresses this issue.

2.2.1.1. IMO Model Course 6.09

Training Course for Instructors deals with the techniques of training and the particular responsibility of trainers. It includes many teaching methods together with their applications in training, using various cognitive styles of teaching and training. It consists of the planning, organizing and preparation of an effective teaching, and the selection of appropriate methods of instruction and teaching materials. Additionally, the

course covers the assessment of participants, monitoring progress during courses, and evaluating the teaching and learning process. Obviously, the main objective of the course is directed at promoting the knowledge, skills and aptitudes which the trainer should have to gain a great benefit for efficient implementation, planning and conduct of other IMO model courses. The trainers will be fully aware of the range, types, content and opportunities offered by other model courses (IMO, 2001[b]).

2.2.2. Instructional Techniques

MET institutions need to offer fundamental skills courses to develop pedagogical skills for their instructors, especially those with limited teaching experience. In many MET institutions new MET instructors, in particular, are given no formal teaching training. The WMU MET specialisation is designed to help graduates train other trainers. Many of them have actively assisted their institutions; this effort, however, has been very limited (Muirhead, 2004). The WMU MET course comprises a combination of professional, pedagogical, management, maritime sector and how-it-id-done-somewhere subjects. The training of MET instructors at any institution should comprise the previous subjects (Zade, 1997).

According to Zade (2000, p. 94), "There is an obvious lack of pedagogic training for lecturers at MET institutions in METHAR (Harmonization of European MET Schemes) countries. Learning by doing is the approach used most often." According to the METNET project, new instructors are often not given the opportunity to attend appropriate training courses and are often unwilling to introduce and accept pedagogic changes. Moreover, MET institutions have to encourage all instructors to update their knowledge by publication of their lecture notes and enhance their awareness about learning psychology, development of courses for students, teaching techniques, the use of standard instructional media, assessment of students, course evaluation, and so forth. (Zade, 2003).

The training and assessment of seafarers must be structured in accordance with written programs in compliance with the provisions of section A-I/6 of the STCW Code. MET instructors should develop their skills to identify learning aims and objectives. The development of learning objectives is a major challenge for many instructors.

STCW 78/95 states varieties of requirements on the MET instructors and assessors in training and assessment methodologies, such as, simulator instructors need to obtain guidance in instructional techniques and acquiring practical simulator operational experience. Appropriately qualified and experienced MET instructors can make the necessary changes in order to comply fully with the convention. Perhaps the biggest challenge MET institutions face is having sufficient qualified and experienced MET instructors to fully comply with these requirements.

2.2.3. Prevalent Knowledge Culture

Generally, widespread knowledge awareness will ensure that personnel keep on learning. The significant basis for the continuity of the education infrastructure is the general awareness about updated maritime knowledge which is vital for progress and competitiveness in the maritime industry. Putting education in the broader perspective of the maritime knowledge infrastructure, which contains four elements: Collection, storage, transfer and application of knowledge, offers a way to select concrete policy measures that help achieve the aim of the continuity of maritime education. The transfer of knowledge (i.e. teaching) is related to and is dependent on the other three activities (Veenstra, 2002).

MET instructors and assessors should be motivated to upgrade their level of education not only for their personal benefit but also to be able to work as a team with their colleagues for the benefit of their institution’s reputation. A continual learning and a training culture will necessitate all instructors and assessors to keep their knowledge and

skills up-to-date. It is crucial to reach higher standards, higher qualifications and higher performances.

2.2.4. Maritime Research

Research is becoming increasingly important in maritime education. According to Pourzanjani (2001, p. 25):

> There has been a dramatic change in the attitude and approach of maritime institutions towards 'Research'…research and other scholarly activities are seen to firstly underpin and support the teaching programmes which take place. Secondly, to provide expertise to support the relevant industries, and finally to push forward the scientific barriers in different disciplines.

Maritime research can be seen as a development activity to gain benefit for individual MET instructors. Maritime research offers the latest development to the instructors in their subject area and involves them in the latest scientific and industrial developments. Developing a research culture and offering a suitable research environment at any MET institution can enhance the knowledge and skills of the instructors.

2.2.5. Technology Awareness

In recent years, the use of computers and information technology in the field of education and vocational training has grown significantly. MET instructors have to be empowered with knowledge, skills, and abilities that technologies offer and provided by administrative and technical support to deliver and develop courses. MET instructors' skills are required to cover such aspects as course design, selection of suitable learning activities, preparation and usage of instructional media, assessment of students, usage of technologies and simulators for training and assessment, course evaluation and quality standards. The conjunction between these teaching skills will help MET instructors to

meet the STCW standards. MET instructors need to increase their awareness of technological changes and the potential advantages to be gained from its use.

MET instructors should develop their teaching skills to grasp the challenge of integrating simulator training into the overall course curriculum. A qualified simulator instructor plays a very crucial role in simulator training. The numbers of highly qualified simulator instructors are still very limited. The properly qualified instructors who are the cornerstone of the simulator training exist by a good training strategy which every institution should adopt, and by cooperation between global MET institutions (Cross, 2008).

2.2.6. Maritime English Teaching

The English language has become a major medium for communication globally. Integration of communication skills development with curricula of MET institutions will enhance students' English language and communication skills; and furthermore, it will aid in the globalization of MET (Luo & Tong, 2005).

Maritime English teaching has two aspects, Maritime English (language course) and maritime subjects taught in English (subject course). Maritime English is English used in maritime contexts to consolidate the learner's understanding of the maritime knowledge. However, teaching maritime subjects in English benefits the learners in their language acquisition and improves their linguistic skills (Biao, 1999).

> Internationally much brainwork will continue to be spent on the development of communication technology to a very high level, while insufficient effort will be spent on improving the language communication proficiency of the people expected to handle such sophisticated equipment…the development of

> technology and of the respective faculties of the ships' officers should be paid equal attention (Cole & Trenkner, 2004, p.74).

As a result of realizing the crucial role of Maritime English teaching and training, more attention is being given to it by MET institutions, the competent authorities concerned and the entirety of shipping activities. The proper command of the English language is basic in developing MET instructors' professionalism (Biao, 1999).

The maritime industry is becoming increasingly aware of the critical role the communication plays in safety. Obviously, Maritime English can make a positive contribution towards the safe and efficient operation of ships in an international maritime industry. A good command of the English language and of maritime terminology and phrases is a prerequisite for the ability of ship officers to work with multi-lingual crews. The importance of effective communication between shipmasters, crew and coastal authorities, especially during an emergency, has been recognized by IMO. Therefore, IMO adopted the Standard Marine Navigational Vocabulary (SMNV) in 1978 which has now been replaced by the Standard Marine Communication Phrases (SMCP) in 2002. Maritime English was made a requirement within STCW 78/95 at Table A- III/I & II, with the use of SMCP and the vital aspects of accurate communication by ship's watchkeepers. Additionally, the ISM Code stresses that ship's personnel are able to communicate effectively. Therefore, seafarers must demonstrate knowledge of English for the purposes of professionalism and safety.

The SMCP, which is designed to be more comprehensive than the SMNV, has been distributed to Governments, maritime training institutions and others who are involved in maritime communications. Moreover, IMO has published a model course, *Teaching Maritime English*, No.3.17. The aim of all these efforts is to overcome the problem of communication barriers at sea and avoid misunderstandings which can cause accidents.

The teaching of Maritime English is a critical activity and one in which substantial improvement is needed (Valerie, 2006).

“Each higher MET institutions and Maritime English instructor should strive for the optimum or most promising qualification method while bearing in mind that MET institutions and Maritime English teaching staff alike are subject to the obligations of STCW 78/95” (Cole, Pritchard & Trenkner, 2006, p. 40). Teaching standards vary internationally in teaching professional subjects at MET institutions around the world, and despite some excellent examples, many remain in need of improvement. All MET instructors, whatever the specialist subjects they teach, should have a good command of English and be familiar with Maritime English terminology; they should use the appropriate words and phrases as in the SMCP (Yongxing, 2002).

CHAPTER THREE

3. IMPACT OF INTERNATIONAL LEGISLATION AND NEW TECHNOLOGIES ON MET

The requirement of new international legislation and technological changes which is taking place in the maritime industry has driven MET institutions to adjust themselves to meet the industry's demands for competent seafarers. As a result, MET institutions introduced updated materials into their syllabuses to improve the education and training system with respect to the new developments. This chapter traces the impact of international legislation and technological innovation on MET.

3.1. International Legislation

For any MET institution, it is crucial to continually respond to the international and national legislation. For example, The IMO Conventions and Codes (Loadlines 1966, Tonnage 1969, COLREG 1972, MARPOL 1973/78, SOLAS 1974/78, ISM, ISPS, STCW 1978/95, and so forth) must be taken into account in the design of a MET system. Any new legislation will influence further training needs. Consequently, the development of MET instructors has to fulfil any requirements of the new legislation. An appropriate response to national and international legislation, and particularly the ISM Code, the ISPS Code and STCW 78/95, is essential to further develop and update MET curricula.

3.1.1. International Safety Management (ISM) Code

The ISM Code is widely considered as one of the most important measures adopted by IMO during the last few years because it is designed to ensure that shipowners make safety a first priority. The Code establishes the safety management objectives of a company, which continuously improves the safety management skills of personnel ashore and aboard ships. The Code intended the maritime community to raise the quality

level of its production, to improve the safety of international shipping and to reduce pollution from ships (IMO, 2002). The MET system, where seafarers were qualified, is consequently important because it is impossible to expect optimistic results in quantitative and qualitative aspects without a high level of maritime education, training and research system. Therefore, the Code is an important aspect that should be considered for the design of MET schemes. Special attention is required from MET institutions to train those concerned with the Code and to facilitate and promote its implementation.

The Code requires a safety management system (SMS) to be established by the company; it aims to upgrade the organization system to an international level and to improve documentation to achieve a competitive advantage in the market with full customer satisfaction. ISM certified ships' teams can be highly variable in quality, training, attitude, culture and management; therefore, intensive education and training is critical to the success of any maritime SMS. The ISM Code is effectively seen as a means of ensuring that those responsible for the ship and its crew and passengers comply with all the requirements established by IMO. Consequently, quality must be clearly understood as a central point in order to survive. MET institutions should continuously improve their Quality Standards System (QSS) and examination requirements for maritime education, training and assessment (Thai & Grewal, 2006).

3.1.2. International Ship and Port Facility Security (ISPS) Code

In recent years, the issue of maritime security has become a major concern on the international maritime agenda. The ISPS Code establishes a number of requirements regarding contacting governments, ships, port facilities and relevant maritime industries. Regulation XI-2/6 confirms the obligations of the company and the authority of the Master in exercising his professional judgment over decisions necessary to maintain the security of the ship. The Code specifies training requirements for the Ship Security

Officer (SSO), Company Security Officer (CSO), Port Facility Security Officer (PFSO) and others with and without security duties. Regulation XI-2/13 and 18 emphasizes the importance of training, drills and exercises on ship security and port facility security (IMO, 2003).

The proper implementation of the Code to achieve its objectives, as stated in Regulation XI-2/1.2, requires well educated and trained people. Therefore, the MET institutions where they were qualified are crucial in maintaining the security of ships and ports.

> Emphasis should be placed on the important role played by those provide this training and we must ensure that they are highly qualified, well motivated and provided with a work environment that helps improve their skills and encourages them in carrying out their professional responsibilities (El Ashmawy, 2005, p. 150).

MET instructors may possibly require additional security training in security organization because they are not specialized in maritime security matters, so as to be able to deliver valid, reliable and practical ship security training.

Recognizing the importance of education and training, the IMO Integrated Technical Co-operation Program provides assistance to developing countries for continued education and training. Moreover, IMO has published three model courses; which aim to provide knowledge to those who may be designated to perform the duties and responsibilities of the following:

1. SSO as defined in section A/2.1.6 (and section A/12) of the ISPS Code and in particular the duties and responsibilities with respect to the security of a ship, IMO model course No.3.19.

2. CSO as defined in section 2.1.7 (and section A/11) of the ISPS Code, Part A, and in particular the duties and responsibilities with respect to the security of a ship, IMO model course No.3.20.
3. PFSO as defined in section A/2.1.8 (and section A/17) of the ISPS Code and in particular the duties and responsibilities with respect to the security of a port facility, IMO model course No.3.21.

Appropriate security-related provisions in STCW 78/95 were expected to greatly enhance maritime security by developing model training courses and guidance on training for ship, company and port facility security officers in accordance with the ISPS Code. It is expected that further contributions from the present comprehensive review will include appropriate security-related provisions to improve maritime security.

3.1.3. International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 78/95

The STCW 78 Convention is the principal international treaty regulating seafarers' training, certification and watchkeeping. The STCW 78 Convention was the first attempt to establish global minimum professional standards for shipboard personnel. The sustainable amendments of STCW 78 attempt to reduce the education/training-job-gap by greater use of advanced technologies. The competent use of modern teaching equipment such as ship handling, engine room operation and cargo handling simulators has helped to further enhance education and training.

STCW 78/95 introduced competence requirements in addition to knowledge requirements; and prescribes that it is not enough for shipboard personnel to know how something is done (knowledge), but also to be able to do it (competence).

The stress of the STCW Convention and STCW Code now is rather on fulfilling of formal so-called minimum requirements by obtaining of certain capacity of

theoretical knowledge and practical skills than on complex qualitative development of high educated and capable of original thinking decision-makers (Alop, 2004, p.7).

3.1.3.1. Development of the STCW Convention

The STCW 78 Convention was a basic start towards the establishment of an international standard of competency that could be globally agreed. As Okore (1999, p. 16) states: "It was also unique in the sense that for the first time, codified global technical standards was targeted at seafarers instead of the ships." Frequent reviews of the STCW 78 Convention are essential for the shipping industry to ensure that the principle factors determining standards of seafarers' competence are sufficient, updated, modernised while also fulfilling the industry's needs.

After more than 10 years subsequent to the STCW 78 Convention had entered into force; a requisite for the 1995 amendment resulted due to extensive changes in shipboard technologies, lack of mechanism for enforcement and lack of precision of the phrase "to the satisfaction of the administration." The loss of credibility of the STCW 78 Convention generated growing criticism of the Convention. The Convention became ineffective and unresponsive to the safety and environment protection needs. The 1995 amendment constitutes a comprehensive package of measures designed to improve standards of competence globally. In the process it creates new responsibilities for governments, the maritime industry, maritime education and training systems, ship operators and seafarers (Prasad, 1999).

STCW 78/95 contains a wide range of provisions covered mainly in three major areas:

1. Explicit responsibilities for shipping companies towards their seafarer's competency.
2. Uniform standards for the accomplishment of competence in particular maritime skills.

3. Measures to ensure proper implementation by those governments that are Parties to the Convention. Parties will be required to provide IMO with detailed information relevant to implementation, such as administrative measures taken to ensure compliance with the Convention, certification procedures and education and training courses (IMO, 2001[b]).

The 1995 amendment was intended to address particular concerns about precise standards of qualification and competence relating to the abilities needed to perform shipboard functions safely and effectively. In addition, they accommodated modern developments in training and shipboard organisation (International Shipping Federation [ISF], 2007).

The 1995 amendment establishes uniform standards for the attainment of competence, in particular maritime skills. It contains specific criteria detailing the standards of knowledge, understanding and proficiency to be achieved in each element of competence by candidates for certification, and the criteria for evaluating them. The amendment extends elementary standards of competence to categories of shipboard personnel and place much more emphasis on the outcome of training and the ability of seafarers to perform their duties competently. The competency tables in the STCW Code places greater emphasis on proficiency and the actual ability of seafarers to perform their tasks satisfactorily and contains specific criteria for evaluating competence accordingly.

STCW 78/95 encourages the better use of advanced technologies, in particular marine simulation, to assess and improve the competency levels of seafarers to perform their functions. STCW 78/95 recognizes the importance of simulators in MET by using Radio Detection and Ranging System (RADAR) and Automatic Radar Plotting Aids (ARPA) simulators in training and as a method of demonstrating competence as a mandatory requirement for watchkeepers in the deck department. Furthermore, simulation training

is included as an alternative method to the use of full-scale training on board a vessel (Barsan, Hanzu-Pazara & Arsenie, 2007).

STCW 78/95 contains new provisions regarding the qualifications of instructors and assessors, including a requirement that they are qualified for the specific task for which the training or assessment is being conducted. The quality of education and training provided at maritime training institutions depends mainly upon the quality of the academic staff that the institution can attract and retain and the adequacy of facilities and training equipment and aids provided. The shortage of properly experienced and highly qualified instructors and assessors still presents problems for many countries.

3.1.3.2. The Need for a Comprehensive Review of STCW 78/95

Given the growing interest in the human element as one of the most important factors influencing the international shipping industry and, consequently, the world economy, it gradually became clear, after nearly thirteen years had passed since introducing the 1995 amendment, that further amendment was needed to STCW 78/95 to counter its shortcomings and weaknesses in the regulatory and technical provisions. The current comprehensive review of the STCW 78/95 is to ensure that it will be able to meet the new challenges facing the shipping industry today and in the future.

The competency presented by STCW 78/95 is a basic requirement for quality seafarers. Further understanding of high quality can be achieved along with the sustainable development of the maritime industry and maritime profession (Barsan et al., 2007). In addition to basic seafaring skills, contemporary seafarers must have excellent computer abilities and a good command of English. Moreover, they will have high ability and quality in seamanship, shipping management, interpersonal communication and leadership. IMO model courses need to be developed to provide acceptable training and important information and knowledge in compliance with training standards in international maritime legislation (Fuazudeen, 2008).

The safe operation of highly automated and specialized ships can be achieved by IMO and MET institutions with the development of model courses to train officers and engineers. The operation of steam propulsion plants and new concepts like dual-fuel-electric machinery need to be addressed in STCW to enhance seafarers' competency levels. These kinds of ships need specialized model training courses and review the requirements leading to dangerous Cargo Endorsements (DCEs) for their seafarers.

The current comprehensive revision of the STCW 78/95 Convention will expose many new concepts and procedures for administrations, shipping companies, training institutions and seafarers. For proper implementation, this amendment will take time and a great deal of effort from all STCW stakeholders. IMO needs to make considerable efforts to support the implementation of the new amendment and to explain and draw awareness of the implications of the new amendment by holding regional seminars and workshops. There are various impacts of predictable amendment on MET institutions.

3.1.3.3. The Impact of Predictable Amendment on MET Institutions

Many new approaches and changes in training and assessment methodologies will likely result from the current comprehensive review of STCW 78/95. Such changes will place new demands on training institutions and on their instructors and assessors. Furthermore, the new requirements will require a substantial cost, funding for which may be not available in many MET institutions. In order to ensure the proper implementation of new regulations, there is a critical need to invest in infrastructure, including simulators and teaching facilities.

IMO will revise the model courses which will be affected by the new amendment and it will create new model courses according to that amendment. Moreover, the new IMO model courses will cover important functional areas included in the STCW to be amended (Fuazudeen, 2008). Maritime institutions will need to review all existing courses and training resources, construct new courses and establish the teaching syllabus

and the curriculum for each course under the new requirements to ensure the acceptability of the training outcomes under the new amendment.

3.2. New Teaching Technologies

Nowadays, the world is becoming an information society; with advanced technologies and network capabilities supporting communication, sharing information and learning. Education and training depends intensively on information, communication, and information technologies (Hathaway, Muse, & Althoff, 2007). According to Muirhead (2004), the integration of technologies into education will continue to increase with technological advances, and MET institutions will need to consider adding new technology to the range of the facilities they offer.

Unfortunately, many institutions suffer from the lack of trained and experienced instructors and assessors who can handle various kinds of simulators and CBT. MET institutions need to ensure that teaching personnel have the appropriate qualifications and experience in these technological matters. Moreover, the instructors must have a clear understanding of the use of advanced technologies in their education, training, supervision and assessment. MET institutions have to consider the capabilities of a simulator facility and CBT to meet course training objectives, and the instructors also need to know the suitability to use simulators for assessment. In order to do this, the MET institutions have to have properly trained, qualified and experienced simulator instructors and assessors (Fisher & Muirhead, 2005). Without such personnel, these institutions will be incapable of fulfilling their mandate.

3.2.1. Computing

The growing impact of the developed electronic assisted learning, such as the use of advanced CBT and simulators in MET, will raise the standards of competency from one based on knowledge to one based on the practical demonstration of skills to perform

the functions properly. The CBT and simulators are powerful tools which can be applied in support of maritime training objectives. Introducing new technologies onboard ships will force the MET institutions to initiate special courses to help the seafarers properly handle these new technologies. The proper usage of advanced technologies and facilities will help instructors and seafarers to improve their capacity.

3.2.1.1. Simulators

STCW 78/95 lays strong emphasis on the competency based training at all levels of a seafarers' career. STCW discusses the simulator under two regulations:

1. STCW Regulation-I/6, Section A-I/6 and Section B-I/6 which raises the possibility of using simulators as a tool to measure seafarer's competencies during the discussion on training and assessment of seafarers.
2. STCW Regulation-I/12, Section A-I/12 and Section B-I/12 which highlights the use of simulators.

According to Part A of the STCW Code, the instructor conducting simulator training and assessment must receive appropriate guidance in instructional techniques, as well as in assessment methods and practice. Moreover, he/she needs to gain practical simulator operational experience and assessment experience on the particular type of simulator. According to Muirhead (2004), this is not an easy task; it can, however, be accomplished by following the IMO simulator model courses, manufacturer provided courses and under studying with an experienced simulator instructor. Inexperienced simulator instructors can easily introduce extraneous variables that can influence the task or performance beyond that conceived by the original training objective.

Many functions can be performed by using simulators. STCW 78/95 emphasizes the training conducted at a simulator in parallel with the experience of in-service training. Simulator training is steadily replacing the in-service training of seafarers. Undoubtedly, the simulator instructor should ensure that the simulator-based training is designed and

conducted in such a manner that it gives, as much as possible, real time experiences. The simulator instructor should know how to observe the capabilities and limitations of his/her simulator to provide an acceptable operating environment for the chosen objectives and skills (Fisher & Muirhead, 2005).

According to the STCW Code, Part A, Section I/12, "Each Party shall ensure that instructors and assessors are appropriately qualified and experienced for the particular types and levels of training and corresponding assessment of competence." STCW does not set specific qualifications for marine simulator instructors. MET institutions set different standards of marine simulator instructors according to the circumstances. Standards have to be satisfactory and approved by the maritime administration ratifying the STCW Convention. The minimum basic requirements for simulator instructors, which is widely agreed, are: he/she should have an operational experience relative to the type of simulator being used for his or her task in the training conducted, have conducted pedagogic training in the use of simulators in training and have conducted technical training involving the use of the particular type of simulator being used (Cross, 2002).

Simulators have been accepted as a major source to provide and prove competency (Ali, 2006). Arms (2004, p.13) has also noted their expanding use: "In recent years there has been significant progress made in the use of simulators as tools for the evaluation and assessment of students and professional mariners." According to the STCW Code, Part A, Section I/6 "Any person conducting in-service assessment of competence…if conducting assessment involving the use of simulators, have gained practical assessment on the particular type of simulator under the supervision and to the satisfaction of an experienced assessor." The assessors should have the same background as the instructors. They should be conversant with various assessment techniques, be aware of the criteria used for assessment and be capable of creating and developing evaluation scenarios and

exercises. They can build up their skills by experience to ensure the proper use and the most valid and reliable methods of assessment.

A simulator instructor is crucial in conducting quality training on simulators to achieve the desired results. Major efforts in the maritime industry to improve the qualification of simulator instructors are as follows:

1. IMO model course 6.09 which is concerned with the MET instructor's knowledge, skills and aptitudes.
2. The WMU created a *Professional Development Course* (PDC) in 2004 with the aim of teaching instructional skills to maritime simulator operators.
3. A *Train the Trainer* course which has been conducted at the Integrated Simulation Centre (ISC) in Singapore. This course was intended to improve the expertise of the simulator instructors in conducting the simulator based training. A similar course was also conducted at the Regional Maritime Academy, Ghana, with the assistance of the IMO (Ali, 2006).

There are differences in the competencies required of a maritime instructor employed in class room instruction and of an instructor of simulator-based training. As Syms (1997, p. 88) points out:

> Not only must today's simulator instructor be familiar with the simulator he or she is operating but must also be fully familiar with the front end equipment – the radars, GPS (Global Positioning System), DGPS (Differential Global Positioning System) receivers, and integrated navigation systems that are part of the seafarer's world today.

IMO and MET institutions need to place greater emphasis on the specialties of simulator-based training to improve the competency of the simulator instructors and the effectiveness of the simulator training to achieve the objectives of the STCW 78/95.

3.2.2. Communication

Telecommunication technologies have increased in reliability, flexibility and affordability; and in addition support national and international distance learning. The current technological and educational climate of CAL, CBT, satellite communication, mobile telephones, high broadband networks, www, E-mail, multi-media tools, hand-held digital equipment and virtual reality and other technologies have had a tremendous impact on current and future distance learning. “The enhanced ability of wireless communication and ‘movable’ connections with the Internet will just meet the needs of seafarers’ on job training and lifelong learning on their ‘floating territories’” (Ailing, Changwei & Muirhead, 2002, p.181).

3.2.2.1. Distance Learning

The United States Distance Learning Association (USDLA) defines distance learning as: “The acquisition of knowledge and skills through mediated information and instruction, encompassing all technologies and other forms of learning at a distance” (Flores, 2006).

Technologies offer a mix of instructional media: Voice, video, data and print to meet the needs of the distance learner to achieve a high level of quality. Many MET institutions worldwide have a wide range of technological options available to the distance educator (Attar & Fouda, 2004). Conversely, many institutions do not have the expertise to design and produce electronic online study materials suitable for delivery through cyberspace (Fisher & Muirhead, 2005).

Distance learning environments continue to evolve with advancing technologies, moving towards virtual classrooms, using a combination of live, two-way interactive audio, video, or both synchronous/asynchronous computer-based interactions that take advantage of local area networks (LANs), wide area networks (WANs) and the Internet. The Internet has become an essential communications platform and has new capabilities that can be utilized for distance learning.

The technology delivery method features, such items as the eight-way synchronous interactions, individual control screen viewing options, group control over content delivery speed, E-mail and electronic support features along with group facilitators who can support the instructor in handling several tasks during office hours. Using distance learning for MET institutions will provide increased face-to-face contact with other staff and students and take advantage of more resources and laboratories. Thus distance learning is an economical way of expanding MET institutions' activities and making effective use of the new technologies. Consequently, distance learning has increased the pedagogical effectiveness of course content (Pourzanjani & Nakazawa, 2004).

Instructors and developers need to be aware of the weaknesses and strengths of distance learning and must become more aware of their student' needs. The instructor and student relationship has been changed from instructor-oriented to student-oriented. They have to pay attention to different communication styles and cultural backgrounds. The instructor should be able to psychologically reduce the distance gap by using effective teaching practices, different strategies, and appropriate technologies. For instance, during Interview Television (ITV) sessions, care should be taken to the voice tone, body language, movements and eye contact with the camera in order to enhance verbal communication. It is a challenge for instructors to keep the students'attention for a long time on the television screen. The instructor should be able to modify instructional design and content through transmission, transaction, transformation, feedback and evaluation (Ghanem & Hamad, 2004).

CHAPTER FOUR

4. RESEARCH METHODOLOGY AND PROCESS

The Shipping industry needs incessantly highly qualified and competent personnel having heavy responsibilities to ensure the safety of life and property, and the protection of the environment with an aptitude for shipping and other associated activities. Therefore, MET is a very important part of the shipping industry chain. MET instructors are crucial in the progress of education and training. Continually improving MET instructors' competency will raise the skills of future seafarers and benefit the industry as a whole. What was needed, however, was a realistic and reliable picture of MET instructors from the perspective of main MET stakeholders.

The 5 research questions that emerged from the literature review of the previous chapters were as follows:

1. Are there any identifiable deficiencies in the current situation regarding MET instructors' competency?
2. What is the current thinking (problems, proposals and recommendations) of stakeholders concerning the issue of instructors' qualifications and experiences?
3. Is the global MET community willing to help their instructors to keep up with changes in technology, legislation and industry practice?
4. Is there a possibility for worldwide consensus regarding criteria for qualifications and experiences required for MET instructors?
5. Is there a possibility for worldwide consensus regarding the minimum requirements of the infrastructure and technologies at MET institutions?

Different questionnaires were prepared for different respondents, depending on their domains. Anonymity of the respondents was guaranteed. The gathered information was

then analyzed to provide answers to the five questions and in order to develop recommendations as well as suggestions for future research.

4.1. Scope and Coverage of Research

Three hundred structured questionnaires were globally distributed to MET stakeholders in different countries. The informants included the following:

1. Maritime administrations (responsible persons and directors).
2. Shipping companies (managers at different departments).
3. Seafarers (the majority at management level).
4. MET institutions (academic dean and department heads).

The questionnaires were sent to more than one person in the same organization to gather a diversified and reliable response. A number of those persons were Member State delegates to IMO.

The questionnaires were randomly distributed by using different channels:

1. Through WMU graduates to the heads of MET institutions, maritime administrations, shipping companies and Member State delegates to IMO participating in the Standards of Training and Watchkeeping (STW) 39.
2. Through MET institutions, shipping companies and WMU students to seafarers.
3. Through WMU field studies to MET institutions, maritime administrations, shipping companies and seafarers.
4. Through WMU professors to MET institutions, maritime administrations and shipping companies.

4.2. Questionnaire Design

Different questionnaires were clearly designed for different MET stakeholders and contained a brief description of the aims of the survey. Moreover, confidentiality was assured. Some questions were repeated in different questionnaires to gather diversified

information about specific questions. The majority of the questions require of a YES or NO answer. Some questions required the respondents to give views, opinions and comments.

4.3. Stakeholders' Responses

The percentage of responses received from the total targeted stakeholders was about 29 percent, which given the field, was regarded as more than acceptable and in fact, encouraging. Such a high percentage may reflect the importance of the issue of education and training to the stakeholders. The percentages of responses received from the targeted stakeholders are indicated in the Figure 2. Perhaps understandable, MET institutions were the most interested in giving answers (about 37 percent); surpassing the averages seen from the other groups.

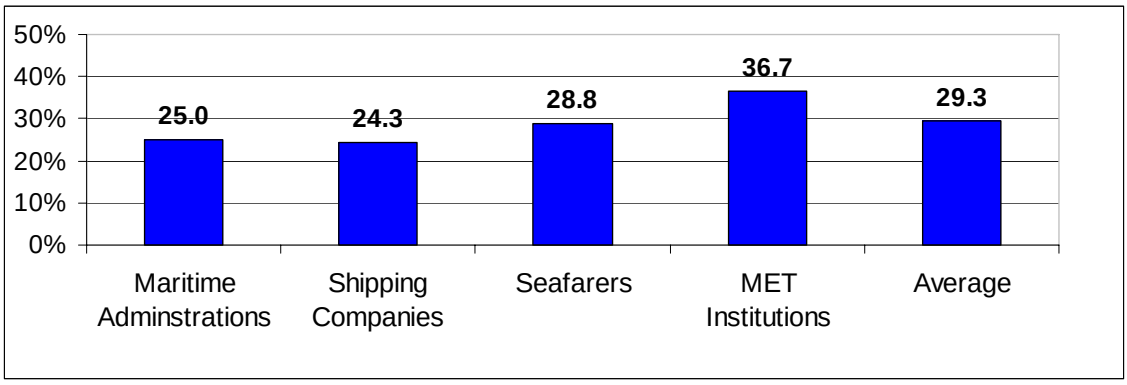


Figure 2: Percentage of responses to the questionnaires

Despite the lack of objective evidence, it is apparent that a reasonable number of the questionnaire's responses show missing transparency and a vague interest, probably, because they do not realize the importance of MET enhancements such as:

1. Some did not answer all questions.
2. Others did not give their opinions about some questions.
3. Apparently, some respondents were afraid to identify themselves by not replying to the E-mail and prefer sending the questionnaire by unidentified post.

The responses from the various groups of stakeholders are treated separately. It is to be expected that the analysis and interpretation of the responses has, to some extent, been influenced by the author's years of experience at sea and in maritime training institutions (24 years), as well as by previous research in the literature. Such influences have also contributed to the recommendations. Recommendations are provided and the conclusions are drawn to overcome any deficiencies or weaknesses evident in the current status.

CHAPTER FIVE

5. RESEARCH FINDINGS

This chapter presents the results of the questionnaires. The results are given separately for each of the four groups of respondents: Maritime administrations, shipping companies, seafarers, and MET institutions.

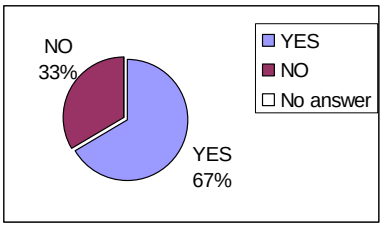
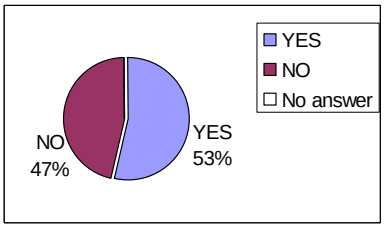
5.1. Data from Maritime Administrations

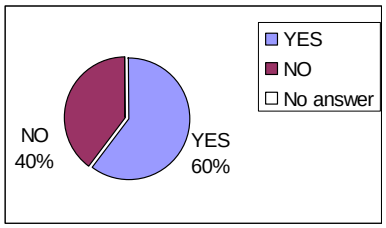
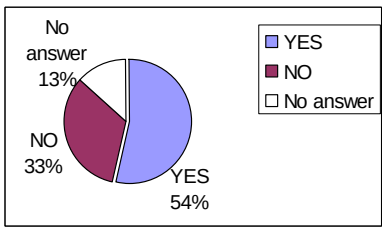
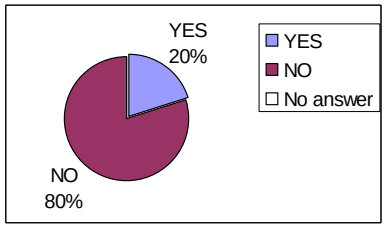
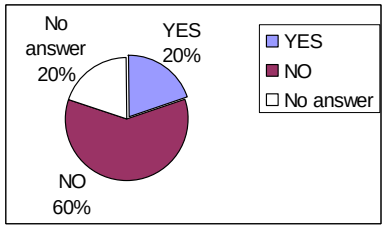
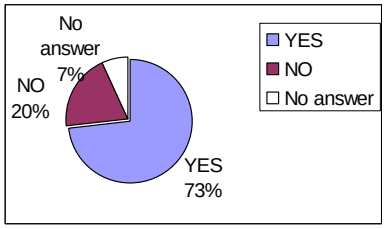
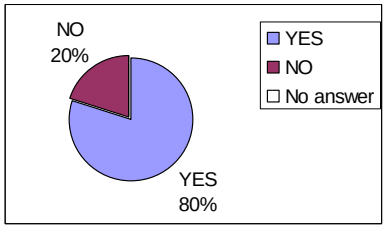
A questionnaire (Appendix A) was sent to sixty persons responsible at maritime administrations; fifteen responded (25 percent). They gave their opinions and comments in addition to Yes and No answers.

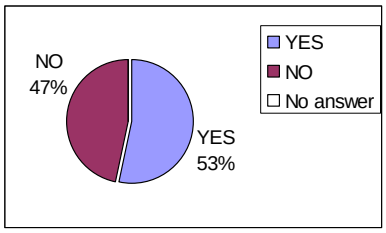
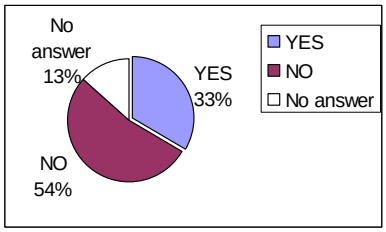
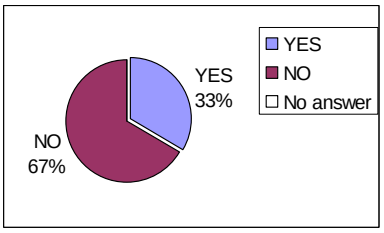
5.1.1. Data Distribution

Table 1 shows the data distribution of YES and NO answers from maritime administration respondents combined with the author's comments.

Table 1: Data distribution from maritime administrations

Q. no.	Data distribution	Author's comments
1		The results indicate that the majority of the administrations encourage feedback from the companies and seafarers about MET institutions while 33% do not believe they do.
2		The results indicate that 53% of the administrations share the feedback from the industry with MET institutions while 47% believe this is not happening.

3		The results indicate that 60% of the respondents believe there is an actual quality control in place to ensure standardization with regard to MET instructors while 40% believe it is not actually implemented.
4		The results indicate that 54% of the administrations have specific criteria for simulator and CBT instructors while 33% of the respondents believe there are no specific criteria and 13% did not answer.
5		The results indicate that the majority of the administrations do not offer training or updating courses for MET instructors while only 20% offer these courses.
6		The results indicate that 60% of the administrations are not satisfied with the current global competency level of MET instructors while 20% of the respondents believe that the competency level of the instructors is satisfactory and 20% did not answer.
7		The results indicate that the majority of the administrations believe there are many shortcomings regarding the competency level of MET instructors while 20% of the respondents believe there are no shortcomings and 7% did not answer.
8		The results indicate that most of the administrations think there is merit in the idea of having a global minimum standard of qualifications and experiences for MET instructors while only 20% do not share the same belief.

9		The results indicate that almost half of the administrations think there is merit in the idea of having global minimum requirements regarding the infrastructure and technology of MET institutions while 47% of the respondents do not believe this.
10		The results indicate that 54% of the administrations believe that they do not have criteria for MET instructors selection and competence while 33% of the respondents believe they have these criteria and 13% did not answer.
11		The results indicate that the majority of the administrations do not have criteria to measure the performance of the MET instructors while only 33% have these criteria.

5.1.2. Reasons behind Dissatisfaction (Q 6)

Respondents gave their opinions and comments in response to question number six in the maritime administration questionnaire (Appendix A). A majority of respondents held a negative opinion towards the current global competency level of MET instructors. The results indicate that there are various reasons behind this dissatisfaction. For instance, the administrations expressed dissatisfactory reasons using expressions like:

1. Most instructors embrace their careers not because they are doing something they like to do, but to secure a job. In some circumstances they become irresponsible.
2. Due to cultural differences and the different levels of implementation of STCW in different states.
3. There are no appropriate audit measures to guarantee that MET institutions have good instructors and they perform accordingly.
4. MET institutions do not have standards for the hiring and training of instructors.

5. Most instructors have only the relevant certificate of competency (CoC) as a qualification but without any teaching qualifications.
6. A lack of sea-going experience.
7. There is a huge difference between instructors worldwide; some are good and some are really bad. Too much variation in standards.

5.1.3. Reasons behind MET Instructors' Shortcomings (Q 7)

The results of question number seven in the maritime administration questionnaire (Appendix A) indicate that there are various reasons behind MET instructors' shortcomings. The administrations expressed these reasons using expressions like:

1. Mainly lack keeping abreast with technological advancements.
2. Lack of technical support in some developing countries from IMO and other international organizations for the MET instructors.
3. Lack of uniform global standards of qualifications.
4. No actual quality control is in place to ensure standardization with regard to MET instructors. The administration simply does not have any control of MET instructors, whether they are qualified or not.
5. The administration controls an establishment's quality control without specifying the minimum standard of MET instructors.
6. Maritime interest development is quicker than MET instructor reaction to the industry needs.
7. Instructors need to have dedication and delivery skills which are lacking among many instructors.
8. Lack of sea-going experience and teaching pedagogies.
9. They need more courses and certain standardization for them to follow.
10. A decline of availability of competent MET instructors.
11. Poor application of teaching and learning theories.
12. Lack of up to date experience.

13. Very large variations in standard.
14. No specific requirements for simulator trainers.
15. Most instructors have only the relevant CoC as a qualification.

5.1.4. Appropriate Qualification and Experience for MET Instructors

The previous comments in section 5.1.2 and 5.1.3 show the critical need to enhance the competency level of MET instructors. The respondents believe that appropriate qualifications and experiences for MET instructors should be as follows:

1. Adequate background and knowledge of maritime practices.
2. Have some experience from work in the educational and training environment.
3. Competent in training development.
4. Capable of operating audio-visual equipment.
5. Relevant experience to back up a high standard education as well as communications and managerial skills.
6. Degree in teaching pedagogies combined with the experience at a high level (Captain or Ch. engineer's CoC) in respect of the relevant subject to be achieved.
7. Have the necessary technical knowledge and be qualified in the assigned task.
8. Practical professional experience.
9. Have the capacity of teaching and evaluating.
10. For non-maritime subjects, a BSc and trained to specific task.

5.1.5. Reasons behind Having Global MET Instructors Standards (Q 8)

Respondents gave their opinions and comments in response to question number eight in the maritime administration questionnaire (Appendix A). The results indicate that there are various reasons behind the idea of having a global minimum standard of qualifications and experiences for MET instructors. The administrations expressed these reasons using expressions like:

1. It would make the global market fairer and it helps to reduce incompetency.

2. Minimum standards for qualifications vary from country to country and are covered by an individual quality system.
3. No doubt, globalization and standardization is very important for maritime safety including seafarer's education.
4. To provide the administration with global standards to guide them in the approval process.
5. To ensure the implementation of the standards before the instructors are hired.
6. To overcome the shortcomings.
7. A common standard would ensure consistency.

5.1.6. Comments on Having Global Infrastructure and Technology Requirements (Q 9)

Respondents gave their opinions and comments in response to question number nine in the maritime administration questionnaire (Appendix A). The results indicate that there are various comments on the idea of having global minimum requirements regarding the infrastructure and technology of MET institutions. The administrations expressed these comments using expressions like:

1. No doubt, globalization and standardization is very important for maritime safety including seafarer's education.
2. It can not be compulsory yet. Some countries are not prepared to ask the private sector (MET institutions) to have expensive technology equipment in place.
3. We will not have minimum requirements regarding the infrastructure and technology of an administration. It makes no differences in trying to do that with an MET institution.
4. The uniform training can be imparted.
5. It does not depend only on each administration but also on the institution's economical situation.
6. To ensure that the institutions have the proper training aids.

7. To ensure the quality of the institutions.
8. There is a merit but the challenge will arise from differences in the funding that each institution receives.

5.1.7. Comments on MET Instructors Selection, Competence and Performance (Q 10 and 11)

Respondents gave their opinions and comments in response to questions number ten and eleven in the maritime administration questionnaire (Appendix A). The respondents who have the criteria for MET instructor selection and competence and to measure their performance gave comments such as the following:

1. It is covered by the Government's MET quality standard system and the MET institutions take the responsibility to describe and document the MET instructor selection, and so forth.
2. It is verified by the maritime administration auditing on a yearly basis.
3. Criteria as per STCW, IMO model course 6.09, MET institutions quality standard system, Flag State guidelines and national regulations are required and experienced.
4. Through the evaluation of response forms filled out by the students.
5. Through the Quality Assurance Agency (QAA), Qualifications and Curriculum Authority (QCA) and observation process.

5.1.8. Processes to Ensure MET Instructors are Updated (Q 12)

Respondents gave their opinions and comments in response to question number twelve in the maritime administration questionnaire (Appendix A). The results indicate that administrations can ensure MET instructors are updated with regard to contemporary regulations and technology by employing different processes. The administrations expressed these processes using expressions like:

1. Conducting regular refreshments courses, promoting workshops and providing incentives for continuing study.

2. It is covered by the State MET quality standard system and left to the MET institutions to describe and document the updating of the MET instructors.
3. This is verified by maritime administration auditing on a yearly basis.
4. Through internal audits at MET institutions.
5. Periodically seminars and workshops held by the administration and circulars distributed to the MET institutions and instructors.
6. Personal exchange among MET institutions, maritime administration and the maritime industry.
7. Institutions have to have staff development programmes in place.
8. The administration delivers IMO copies of the documents to all MET institutions.
9. The administration also invites the MET institutions to participate in the STW subcommittee meetings as advisers to encourage international collaboration and discussion during the annual IMO meetings, as well as to provide direct input into the negotiations being carried out there.

5.1.9. General Comments

The respondents from administrations gave many comments, such as the following:

1. There are some organizations, such as the Global Maritime Education and Training Association (GLOBALMET), which tries to update MET instructors and MET in general. It would be a good idea to encourage administrations to be part of this type of organization to improve in a proper pace and ensure the quality of MET instructors.
2. To have good, competent instructors, you need to pay them well; as much as superintendents / Master / Chief engineer, so that they last long and take up the profession seriously. Increased remuneration will make the profession attractive and a serious player will be eager to join the profession and advance with a cause. The implementation of the above will give rise to healthy competition amongst serious players.

3. The administration can enforce stringent and improved monitoring mechanisms for measuring the standard of the instructors.
4. It is essentially important for IMO to stipulate the international standards and criteria for the qualifications and performance evaluations for MET instructors.
5. Instructors should be updated with newer information as part of their duties.
6. MET needs to keep levels up-to-date on teaching techniques and new technology; without losing basic principles of teaching and roots of maritime education.
7. More regional centres are needed.
8. If institutions follow the IMO model courses, and those courses are taught by duly qualified (i.e. appropriate CoC and teaching qualification) persons, MET will definitely be enhanced.

One deputy director of a maritime administration commented by adding:

1. There is no internationally accepted standard. There should be one; there is so much talk about train-the-trainers, and so forth. The art and skill of teaching or training is a secondary matter. First of all, the person must have the professional knowledge, skills, qualifications and experience. Then s/he may be trained on the art and skill of teaching and training.
2. There are subjects that are not directly professional subjects but need to be taught for the better understanding of the professional subjects. These subjects include: English, mathematics, physics, electricity and IT. For these the instructors should have such qualifications as required for teaching at a college or university.
3. The professional subjects include: Navigation, seamanship, cargo work, stability, communications and signals, knowledge of boilers and steam power, internal combustion engines, principles of gas turbine, steering engine, windlass and other deck machineries, and so forth. These subjects must be taught by persons having the highest sea-going qualifications (Master or Chief engineer).

4. Persons under category three must have a knowledge of changes in the technology. For this they must sail for at least six months every five years (maintain a valid CoC).
5. The extensive use of CBT or simulators can be made but this must be complemented by the human factor. Equipment cannot replace good trainers.
6. Nothing can substitute practical experience i.e. the mandatory sea-time requirement.
7. The Flag State Audit Scheme will not cover STCW matters because there are requirements of I/8 and I/7. Actual interpretation is required. Training institutions and training courses are supposed to be under the control and supervision of the administration that should supervise, assess, approve and monitor. Then the administration is supposed to be audited independently under regulation I/8. That is a two-tier system to cover the whole issue of training and certification. The State (I would not call it Administration in this case because it is a report on their performance which should rather be forwarded by the Minister) should then send a report to the IMO.

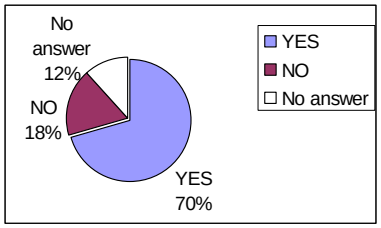
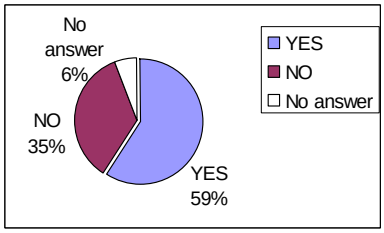
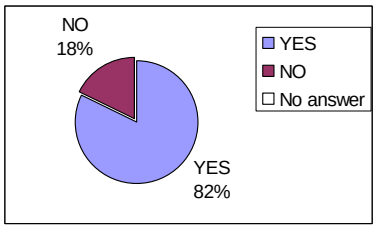
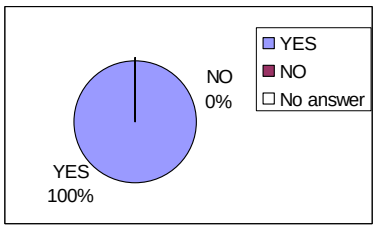
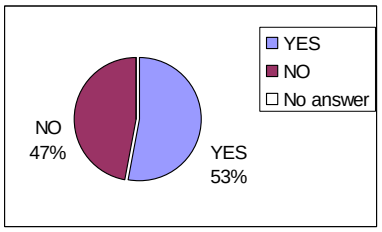
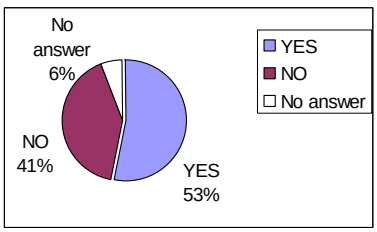
5.2. Data from Shipping Companies

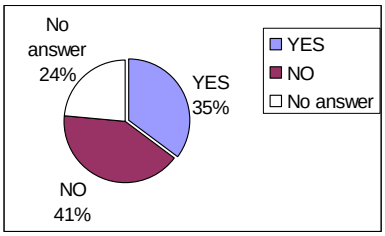
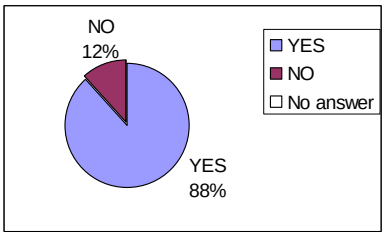
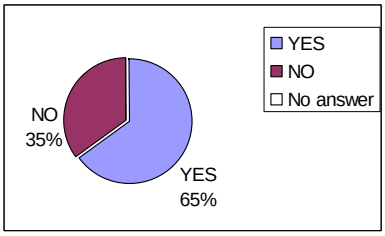
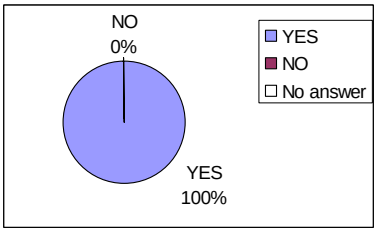
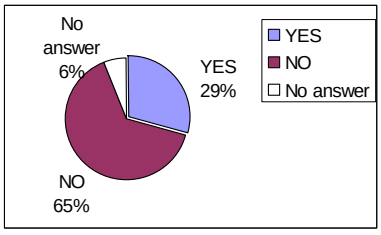
A questionnaire (Appendix B) was sent to seventy persons responsible at shipping companies; seventeen responded (about 24 percent). They gave their opinions and comments in addition to YES and NO answers.

5.2.1. Data Distribution

Table 2 shows the data distribution of YES and NO answers from shipping company respondents combined with the author's comments.

Table 2: Data distribution from shipping companies

Q. no.	Data distribution	Author's comments
1		The results indicate that the majority of shipping companies require feedback from seafarers that they have sent to MET institution while 18% of the respondents do not believe that and 12% did not give an opinion.
2		The results indicate that 59% of the shipping companies believe that onboard training is more effective than MET institution-based training while 35% of the respondents do not believe that and 6% did not give an opinion.
3		The results indicate that most of the shipping companies give importance to the qualification of MET instructors while 18% of the respondents do not give importance to that.
4		The results indicate that all shipping companies give importance to the experience of MET instructors.
5		The results indicate that more than half of the shipping companies believe they sponsor MET instructors for any value-added courses to raise their level of competence/performance while 47% do not sponsor.
6		The results indicate that more than half of the shipping companies satisfy with the current global competency levels of MET instructors while 41% of the respondents do not believe that and 6% did not give an opinion.

7		The results indicate that 35% of the shipping companies believe there are shortcomings regarding the competency level of MET instructors while 41% of the respondents believe there are no shortcomings and 24% did not answer.
8		The results indicate that most of the shipping companies think there is merit in the idea of having a global minimum standard of qualifications and experiences for MET instructors while only 12% do not share the same belief.
10		The results indicate that the majority of shipping companies believe that the current levels of competency for seafarers meet their requirements while 35% do not.
11		The results indicate that all shipping companies find a relation between a seafarer's competency and MET instructors' competency.
12		The results indicate that the majority of shipping companies consider there is no control over the continued suitability of MET instructors while 29% of the respondents believe there is control over that and 6% did not answer.

5.2.2. Reasons behind Dissatisfaction (Q 6)

Respondents gave their opinions and comments in response to question number six in the shipping company questionnaire (Appendix B). The results indicate that 41 percent of the respondents held a negative opinion towards the current global competency level of MET instructors. The results show various reasons behind this dissatisfaction. For

instance, the shipping companies expressed dissatisfactory reasons using expressions like:

1. There are still some more to be improved, especially in experience onboard vessels and systematic teaching methods.
2. Often we find that lack of commitment level, which is required of an instructor; it is the experience and commitment and not really the qualification that matter here.
3. Shortage of competent MET instructors.
4. The trainers are equipped with knowledge but not adequately in skills and attitude.
5. MET instructors are not updated regarding the new regulations and crew's training needs; they are not upgraded periodically.
6. They did not like to learn more from other academic fields using alternative and more innovative teaching aids.
7. MET instructors do not give attention to the feedback from seafarers.
8. MET instructors need to implement more practical than theoretical training.
9. Being away from the industry make instructors less familiar with what's new.
10. MET instructors did not have what is requires to be an instructor in the academy.

5.2.3. Reasons behind MET Instructors' Shortcomings (Q 7)

Respondents gave their opinions and comments in response to question number seven in the shipping company questionnaire (Appendix B). The results indicate that there are various reasons behind these shortcomings. The shipping companies expressed these reasons using expressions like:

1. Less experience of the current operation of vessels.
2. There is a lack of sea experience, in particular on modern ships.
3. They must refresh their information and upgrade their knowledge.
4. They need to increase the practical training.

5.2.4. Reasons behind Having Global MET Instructor Standards (Q 8)

Respondents gave their opinions and comments in question number eight in the shipping company questionnaire (Appendix B). The results indicate that there are various reasons behind the idea of having a global minimum standard of qualifications and experiences for MET instructors. The shipping companies expressed these reasons using expressions like:

1. Unify MET standards in order to fulfil the requirements of STCW across the world.
2. This will ensure some basic minimum control over the competency of the trainer.
3. There are so many regulations from many quarters (such as Tanker, LNG, and so forth) and it is such a big burden for shipping companies today.
4. STCW provides a minimum global standard for seafarers training but not for instructors.
5. To ensure the minimum quality of safety in shipping activities.
6. To maintain and raise competency levels among seafarers.
7. Maritime trade is an international activity and some countries might have lower standards.
8. To keep all MET instructors qualified.
9. There will be no room for substandard levels and unqualified instructors will be excluded.
10. That no institution will hire unqualified instructors to keep the budget low.
11. Companies will not have to fly their seafarers half way round the globe for good training.

5.2.5. Measures to Ensure Competency of Seafarers (Q 9)

Respondents gave their opinions and comments in response to question number nine in the shipping company questionnaire (Appendix B). The results indicate that there are various measures which shipping companies can make to ensure that the competency of

their seafarers keep pace with new regulations, technology and global social dynamics. The shipping companies expressed these measures using expressions like:

1. Continuous training of the mentioned courses both inland-based training centres and onboard ships by shipping companies or ship managers.
2. We send seafarers to our training centre periodically according to their grade and we have also set up a CBT system on our fleet vessels.
3. We inform vessels under our operation of the new regulations and other important particulars.
4. Providing short courses and encouraging regular feedback in writing.
5. Being in touch with MET institutions, visiting them to corroborate what trained seafarers gives us feedback, being updated in new IMO regulations, and so forth.
6. Conducting seminars for floating staff where the latest requirements and analysis of accidents are present to keep them abreast with various developments.
7. Test seafarers regularly to ensure that their competency keeps pace with new regulations, technologies and global social dynamics.
8. Send memorandums to ships to organize training workshops and encourage e-learning.
9. Tracking the new regulations and new courses.

5.2.6. Reasons behind Seafarers' Shortcomings (Q 10)

Respondents gave their opinions and comments in response to question number ten in the shipping company questionnaire (Appendix B). The results indicate that there are various reasons behind 35 percent of respondents believing that the current competency level for seafarers does not meet their requirements. The shipping companies expressed these reasons using expressions like:

1. The necessary experience is lacking due to the worldwide shortage of experienced seafarers prevailing at the moment, and then there is not much choice.
2. The lack of active seafarers.

3. The trainers are equipped with knowledge but not adequate in skills and attitude.
4. Weakness in the competence level of MET instructors.
5. The need to have more focused on training on what they should do onboard.

5.2.7. Processes to Exert Control over MET Instructors (Q 12)

Respondents gave their opinions and comments in response to question number twelve in the shipping company questionnaire (Appendix B). The results indicate that there are various processes to exert control over the continued suitability of MET instructors within specific institutions. The shipping companies expressed these processes using expressions like:

1. We have our own training centres in the world, and we confirm their performances by periodical inspections and cross training among the training centres.
2. The crewing agency that we are using has direct control over the merchant marine academy and school for training and upgrading seafarers.
3. The annual assessment by the head of institutions and the basis on the feedback received from participants.

5.2.8. General Comments

The respondents from shipping companies gave many comments, such as the following:

1. We have administered our own training centre in the world, and we have educated and trained our seafarers there. In addition, we want to improve and keep the level of them in close cooperation with each of our training centres.
2. The idea of global MET is really good and next to the STCW, it could be realised.
3. It is a milestone in the capacity building in the shipping industry if it materializes.
4. Encourage more experienced seafarers to join MET, by increasing the compensation package of MET trainers and giving them more dues for their work (maybe instituting an annual academic prize for them, or asking media organizations like Lloyd to also award MET trainers as they are part of the wider shipping community).

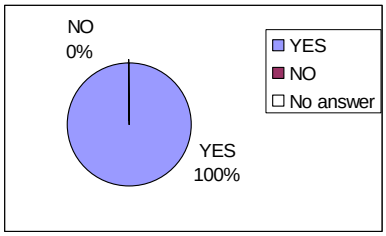
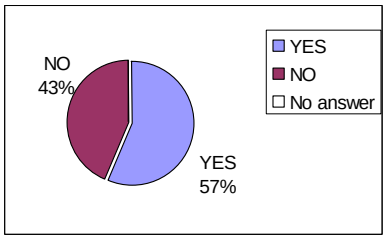
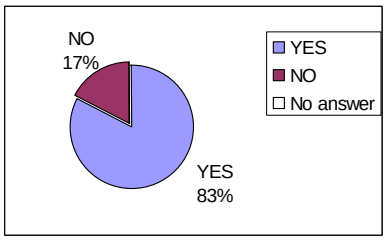
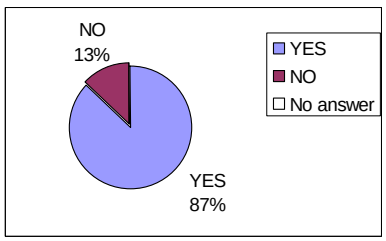
5.3. Data from Seafarers

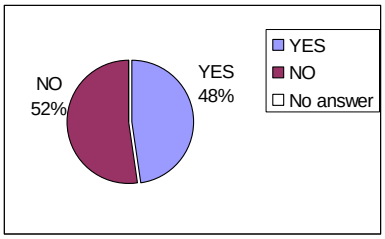
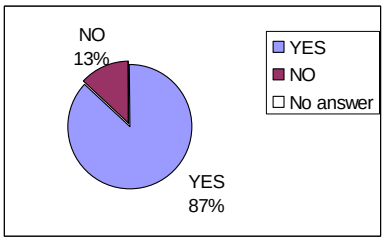
A questionnaire (Appendix C) was sent to eighty seafarers; twenty three responded (about 29 percent). They gave their opinions and comments in addition to YES and NO answers.

5.3.1. Data Distribution

Table 3 shows the data distribution of YES and NO answers from seafarer respondents combined with the author's comments.

Table 3: Data distribution from seafarers

Q. no.	Data distribution	Author's comments
1		The results indicate that all seafarers receive education and training relevant to the industry needs during their studies at MET institutions.
2		The results indicate that while more than half of the seafarers believe that training needs are properly identified by training providers, 43% of the respondents do not believe that.
3		The results indicate that while most seafarers believe that MET instructors are aware of culture-sensitivity issues, 17% of the respondents do not believe that.
4		The results indicate that while most seafarers believe that MET instructors make proper use of infrastructure and technology at MET institutions, 13% of the respondents do not believe that.

5		The results indicate that almost half of the seafarers prefer CBT as opposed to human instructors as a mode of training while 52% do not prefer that.
7		The results indicate that most seafarers receive encouragement to write feedback about their MET institution while 13% of the respondents do not receive any encouragement.

5.3.2. Proper Indicators of a Good MET Instructor (Q 6)

Respondents gave their opinions and comments in response to question number six in the seafarer questionnaire (Appendix C). The result indicates that there are various indicators of a good MET instructor. The seafarers expressed these indicators using expressions like:

1. Up-to-date experience and knowledge.
2. MET instructors who have double backgrounds, for example master mariner and a degree in economics, are more competent than just master mariners.
3. Competence, good knowledge, lecture preparation, communication skills, attitude, culture, self confident, discipline and practical experience.
4. They should be a man or a woman of great stature, have a rich store of knowledge and instruct with enthusiasm.
5. The good handling of available data.
6. The ability to answer the relevant questions.
7. Students' results.

5.3.3. General Comments

The responses from seafarers gave many comments, such as the following:

1. CBT training should be used in conjunction with instructor training, as a supplement.
2. We have some instructors, who have not been out to sea for a very long time, and they frequently give examples of issues which are outdated; so it is important that instructors should have relevant and up-to-date work experience. Perhaps going to sea every five years is not a bad idea.
3. Sometimes, the institution has a problem finding a balance between an academic and a pragmatic view.
4. It is very important that we do not only have ordinary instructors, but visiting instructors from all different aspects in maritime affairs, as insurance companies, shipping companies, oil companies, stevedores, shipbrokers, harbour, sea police, coast guard, and so forth.
5. MET institutions should get the latest information from international organizations, including WMU, to gain improvement day-by-day.
6. Increase practical training and safety culture for all crews.
7. Training session should not be so detailed; get to the point directly.

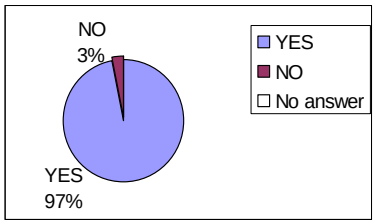
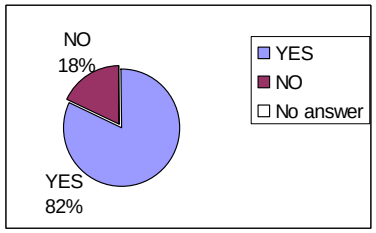
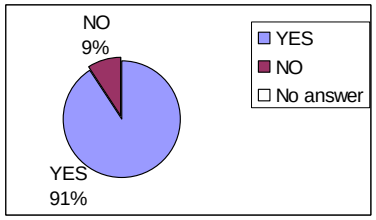
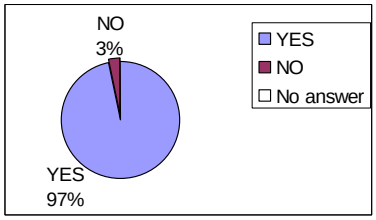
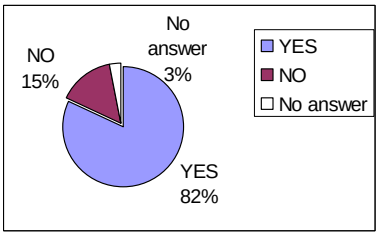
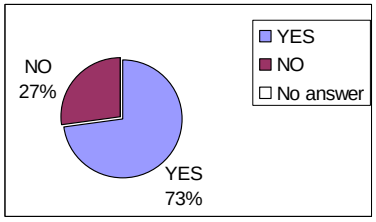
5.4. Data from MET Institutions

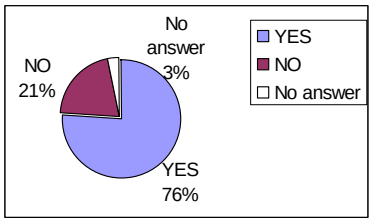
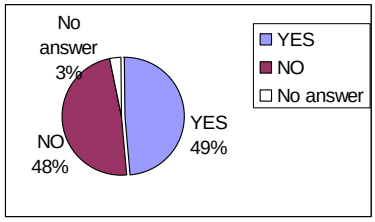
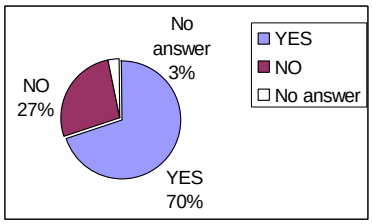
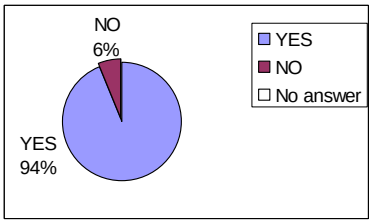
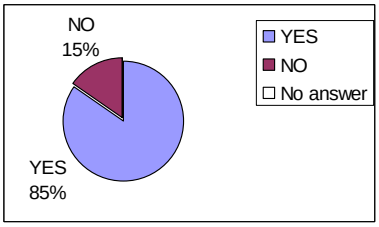
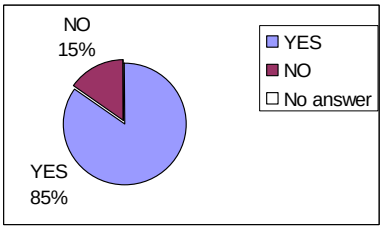
A questionnaire (Appendix D) was sent to ninety persons responsible at MET institutions; thirty three responded (about 37 percent). They gave their opinions and comments in addition to YES and NO answers.

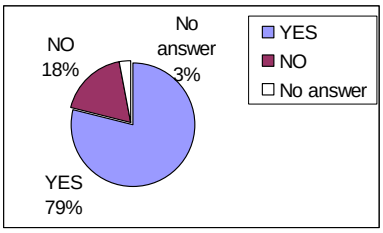
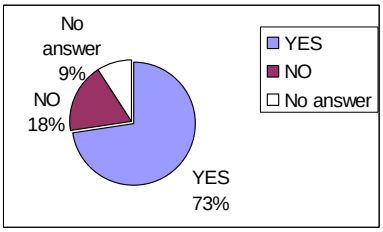
5.4.1. Data Distribution

Table 4 shows the data distribution of YES and NO answers from MET institution respondents combined with the author's comments.

Table 4: Data distribution from MET institutions

Q. no.	Data distribution	Author's comments
1		The results indicate that most the MET institutions have a quality assurance system in operation while only 3% do not.
1[a]		The results indicate that 82% of the MET institutions believe that their quality system addresses MET instructor selection, competence, upgrading and performance while 18% of the respondents do not.
2		The results indicate that most the MET institutions have a process for the development of courses and training materials while only 9% of the respondents do not.
3		The results indicate that most MET institutions have systems for evaluating and responding to student feedback while only 3% of the respondents do not.
3[a]		The results indicate that 82% of the MET institutions believe that student feedback realistically helps in improving future training while 15% of the respondents do not and 3% did not answer.
4		The results indicate that the majority of the MET institutions offer training or updating courses for MET instructors while 27% of the respondents do not.

5		The results indicate that the majority of the MET institutions have a policy to upgrade their instructors while 21% of the respondents do not and 3% did not answer.
6		The results indicate that almost half of the MET institutions are satisfied with the current competency level of their instructors while 48% of the respondents are not satisfied and 3% did not answer.
7		The results indicate that the majority of MET institutions believe that there are many shortcomings with regard to the competency level of MET instructors while 27% of the respondents do not and 3% did not answer.
8		The results indicate that 94% of the MET institutions think there is merit in the idea of having a global minimum standard of qualifications and experiences for MET instructors while only 6% do not.
9		The results indicate that 85% of MET institutions think there is merit in the idea of having global minimum requirements regarding the infrastructure and technology of MET institutions while 15% of the respondents do not.
10		The results indicate that 85% of MET institutions have criteria for MET instructor selection and competence while 15% of the respondents do not.

11		The results indicate that 79% of MET institutions have criteria to measure the performance of MET instructors while 18% of the respondents do not and 3% did not answer.
13		The results indicate that 73% of MET institutions believe that their instructors are aware of culture-sensitivity issues while 18% of the respondents do not and 9% did not answer.

5.4.2. Reasons behind Dissatisfaction (Q 6)

Respondents gave their opinions and comments in response to question number six in the MET institution questionnaire (Appendix D). Almost half of the respondents held a negative opinion towards the current global competency level of MET instructors. The results indicate that there are various reasons behind this dissatisfaction. For instance, MET institutions expressed dissatisfactory reasons using expressions like:

1. Lack of seagoing experience.
2. Less research activity.
3. All instructors are holding minimum requirements under the local administration guidelines; therefore, there is a need for improvement of MET instructors.
4. Most instructors come straight from shipboard duties and do not have any background or training in teaching.
5. Due to the global shortage of seafarers, it is difficult to attract highly qualified seafarers with the academic disposition and abilities required for MET.
6. We miss an instructor upgrading and updating program.
7. We miss decency.

5.4.3. Reasons behind MET Instructors Shortcomings (Q 7)

Respondents gave their opinions and comments in response to question number seven in the MET institution questionnaire (Appendix D). The results indicate that there are various reasons behind these shortcomings. The MET institutions expressed these reasons using expressions like:

1. Lack of visiting other training institutions to exchange experiences.
2. Using old technology; low level of English and practical application.
3. Very often little seagoing experience.
4. Little dedication and subject matter knowledge.
5. Lack of using e-learning technologies.
6. Lack of formal teaching pedagogical and didactical skills for new and existing staff.
7. Less research activity.
8. Low morale of the instructor in the long term his/her career.
9. Lack of understanding the educational environment.
10. Shortage of full time MET instructors, so we employ visiting lectures but dedication is there from them.
11. There is a lack of techniques among MET instructors, and the level of training varies depending on how they were brought up through the ranks.
12. In general, many of the trainers are elderly and hence unable to relate to the youth.
13. Some of the instructors have been a long time without being in touch with vessel operations.
14. Lack of training facilities especially simulators for practical training.
15. No system in place for upgrading and updating instructors to cope with modern trends, new techniques, new legislation and new technological advancements.

5.4.4. Reasons behind Having Global MET Instructor Standards (Q 8)

Respondents gave their opinions and comments in response to question number eight in the MET institution questionnaire (Appendix D). The results indicate that there are

various reasons behind the idea of having a global minimum standard of qualifications and experiences for MET instructors. The MET institutions expressed these reasons using expressions like:

1. Variation from area to area and from country to country.
2. To close the door on any substandard institution.
3. To improve overall MET quality such as attempted through STCW.
4. To improve MET instructors, this leads to upgrading students.
5. Shipping has global standards and seafaring itself is such a global industry, so should maritime education be.
6. We should always look for ways to check and improve.
7. It is not likely that everyone on earth complies with STCW.
8. This will streamline MET to a large extent.
9. Quality must be maintained at all times with experience and qualifications.
10. Seafarer training and qualifications should be standardized worldwide.
11. This actually is the root of the various standards that we still experience today; notwithstanding, the standards and requirements under the STCW Code.
12. To guarantee a minimum quality standard of MET training.
13. This helps to establish a universal standard which could possibly reduce the “error” of interpretation done by different institutions.
14. Shipping is a globalized activity and all member states should comply with IMO instruments such as Conventions, Code and Resolutions.
15. For the sake of shipping safety and uniform implementation of IMO requirements.
16. It will enhance the quality of education and improve safety matters.

5.4.5. Reasons behind Having Global Infrastructure and Technology Requirements (Q 9)

Respondents gave their opinions and comments in response to question number nine in the MET institution questionnaire (Appendix D). The results indicate that there are

various reasons behind the idea of having global minimum requirements regarding the infrastructure and technology of MET institutions. The MET institutions expressed these reasons using expressions like:

1. The need to use computer aids, audio, video, and so forth.
2. To close the door on any substandard institution.
3. Institutions should be capable of achieving their learning and teaching goals.
4. To complement the teaching standards, minimum equipment is even important.
5. Shipping has global standards, so should maritime education.
6. We can grade the MET institutions into different categories.
7. Technology is developing so fast and we have to update our standard accordingly. Every institute should be updated with the latest technology.
8. This would enable every seafarer to gain the necessary knowledge and skills to perform the tasks that are required from him/her without hesitation.
9. To guarantee a minimum quality standard of MET training and the achievement of STCW requirements.
10. Institutions should be structured and equipped in compliance with the STCW Convention.
11. This helps to clarify and implement those international standards.
12. To encourage MET institutions to cooperate and share all kinds of resources with each other.
13. Most maritime institutions lack training facilities.
14. There is a big gap between the training facilities and ship developments.

5.4.6. Criteria for MET Instructor Selection and Competence (Q 10)

Respondents gave their opinions and comments in response to question number ten in the MET institution questionnaire (Appendix D). The respondents from MET institutions who have the criteria for MET instructor selection and competence gave various criteria such as the following:

1. They should have a Master or Chief engineer CoC, International Computer Driving Licence (ICDL), Test of English as a Foreign Language (TOFEL), course on methods of teaching, a BSc and dedicated and subject matter training.
2. Our criteria include the United States Coast Guard (USCG) license and STCW certificates plus advanced degrees.
3. They should have a minimum academic qualification as per appointment (at least Master's degree related to nautical science) and minimum shore experience in the academic environment.
4. Comply with the local administration's minimum requirements.
5. Study at a maritime university and be experts in research and training.
6. At least two years at sea with his/her relevant certificate.
7. Trained by a senior instructor, proven with the *Training Course for Instructors* (6.09) certificate and record from the supervisor.
8. We have identified minimum qualifications for each course and topics in the file summary course.
9. Instructors' selection and competence as per the institution's quality management system.
10. Practical onboard experience and competence of lecture delivery.
11. Education and training background, professional experience, skills in lecturing and communication.
12. Experience in the quality system.

5.4.7. Criteria to Measure Performance of MET Instructors (Q 11)

Respondents gave their opinions and comments in response to question number eleven in the MET institution questionnaire (Appendix D). The respondents from MET institutions who have the criteria to measure the performance of MET instructors gave some criteria such as the following:

1. Students' feedback, attendance at their lectures and overview of their material.

2. Annual report, questionnaire and exam results (student learning outcomes).
3. Instructor evaluation by students, students' performance and academic papers.
4. Criteria in practical teaching assessments.
5. The annual classroom evaluation by supervisors (professor's follow-up in classroom).
6. Results achieved and quality of instructor imparted.
7. Recapitulation of performance records regarding his/her teaching activities.
8. As per the institution's quality management system.
9. Class-delivery monitoring, academic achievement, self evaluation and colleagues' assessment.

5.4.8. Process to Ensure that Curriculum and Instructors are Up-to-date (Q 12)

Respondents gave their opinions and comments in response to question number twelve in the MET institution questionnaire (Appendix D). The respondents from MET institutions believe there are different processes to ensure that both the curriculum and instructors are kept updated with respect to new regulations, technology and global social dynamics. They have declared different processes such as the following:

1. Availability of IMO publications, internet and other sources of information.
2. Circulate the most recent updates and regulations to the MET instructors.
3. Through periodical reviews and updating the course file summary and content.
4. Staying informed about new developments which are then incorporated.
5. Reviewing the training programs.
6. Provide external and internal academic activities (i.e. seminar, conference).
7. Keep a close contact with the regulation authorities.
8. Ensure that it is a part of the Quality Assurance (QA) system.
9. Through conducting staff meetings, and through participation by individuals in societies, clubs, workshops and so forth.
10. Periodical and surprise checks by the administration.
11. Corresponding with local administration.

12. Having a very close relationship and cooperation with the maritime industry.
13. The national maritime administration keeps the traces of the industry through research programmes and issues the mandatory requirements in the form of state decrees.
14. Issues that influence a course are brought to light and discussion is made among instructors relating to the relevance of the subjects covered.
15. The research and development unit has the task to ensure this matter.
16. We are members of many organizations and magazines and we circulate them to all instructors.
17. MET instructors take part in international fora that address contemporary changes in legislation and technology.
18. MET institutions try to solicit feedback from the industry; significant input comes from international legal requirements e.g. STCW 78/95 as well as national policy, regulations and the mission of the school.
19. By focusing on the issues that IMO is addressing and resolving and investigating the demands from the shipping industry.

5.4.9. General Comments

The respondents from MET institutions gave many comments, such as the following:

1. IMO shall indicate the matter as a mandatory requirement in the STCW Convention.
2. Seafarer shortage is a small problem compared to the shortage of qualified MET instructors.
3. Global MET needs more efforts for standardisation and symmetry worldwide; symmetry should be achieved while maintaining diversity.
4. New efforts are required to cater for the new demands of the industry.
5. Shipping companies should be more involved with the training of seafarers.
6. The local administration should be very cooperative with their local MET institutions and should be audited at regular intervals to adjust the standards.

7. More and more seafarers from different countries are working together onboard, so culture-sensitivity issues are more important in the MET field; training courses such as cross-cultural communication or intercultural communication skills should be established in MET institutions.
8. The qualifications of instructors at maritime training institutions have to be standardized globally so that curricula developed under the STCW Code could be truly standardized.
9. Although we have the STCW Code in effect, there is still that disparity between knowledge and skills passed on to students throughout the world mainly due to the qualifications of the instructors and the types and levels of training resources and infrastructures available at each training institution.
10. Working in a maritime institution is very hard and one needs to be fully conversant with the rules and regulations, and everybody must be updated with the technology available.
11. Theoretically, it would be feasible and welcome to have a universal standard to harmonize and regulate this global industry, but the problem may be that the implementation is largely up to the maritime administrations in different countries; the diversity of cultural, social and economic aspects might also have a significant impact on that. We should look for reasonable solutions.
12. To meet the growing market needs and more programs to be developed mean more instructors in the terms of quality and quantity needed.
13. Due to the global shortage of seafarers it is difficult to attract highly qualified seafarers with the academic disposition and abilities required for MET, which means that the current levels are not optimum.
14. The language in STCW is too vague to address this and therefore a further standard is needed.
15. The global nature of shipping and crewing requires global minimum requirements regarding the infrastructure and technology of MET institutions. It is too idealistic;

there are, however, significant reasons why achieving this may be very difficult if not impossible because different nations have different realities, financing and cultural differences.

16. It should be prescribed for each level of training, type of equipment and technology to be used for training at maritime institutions worldwide.

5.5. Member State Delegates to IMO Comments

The respondents from some Member State delegates to IMO who participants in the STW 39 gave many comments such as the following:

1. The current model courses are suitable for meeting the contemporary demands of MET but:
    a. Necessary upgrading needs to be taking into account in a fast technology-driven environment.
    b. Needs revision to take into consideration new things involved globally.
    c. They do not allow for a student centred teaching and learning style.
    d. It is only as a basis for further development.
    e. More model courses will be helpful.
    f. There is no process at IMO to develop and create model courses.
    g. It is not in line with the latest technology and ship operation functions.
    h. We have our own requirements on top of the STCW requirements.
2. The voluntary audit scheme for administrations does not properly cover MET institutions.
3. There are no global minimum requirements regarding the infrastructure, technology and manning of MET institutions.
4. The States are not transparent enough to share their shortcomings with the IMO.
5. IMO does not provide enough technical assistance and guidance to countries where MET institutions require support.
6. The MET institution standards do not considered when to put a States on white list.

7. The present IMO educational institutions (WMU in Sweden, IMO International Maritime Academy [IMO/IMA] in Italy and the International Maritime Law Institute [IMLI] in Malta) are not sufficient in capacity to support MET.

CHAPTER SIX

6. ANALYSIS AND DISCUSSION

A total of 88 worldwide responses, which consisted of 15 maritime administrations, 17 shipping companies, 23 seafarers and 33 MET institutions, were collected. These responses represented 35 countries (Appendix E). The responses together with earlier research and literature review are analyzed below to present the current global status of MET with regard to MET instructors. The objective of this analysis is to understand the demands of MET stakeholders regarding their needs for upgrading the knowledge and skills of MET instructors.

The responses show a high degree of awareness among MET stakeholders about the quality of the MET system and in particular the quality of the MET instructors. Further, while the majority of MET stakeholders show a positive optimism about the future, they also indicate a clear desire to improve the MET system, particularly the MET instructors.

Although the responses of questionnaires show considerable variation in the opinions and comments on the current global competency level of MET instructors, it is apparent that a great number of MET stakeholders are dissatisfied with the current level (Q.6). The majority of them believe it is a need to have a global minimum standard of qualifications and experience for MET instructors to overcome the shortcomings previously stated (see Chapter Five).

Despite the fact that the majority of maritime administrations respondents having an actual quality control in place to ensure standardization with regard to MET instructors, they do not offer updating courses for MET instructors. Furthermore, all shipping companies realize the relationship between seafarers' competency and MET instructors' competency and most of them give importance to the qualifications of MET instructors, however, almost half of them do not sponsor MET instructors for value-added courses.

Questions six, seven, eight and nine are repeated in different questionnaires to gain an appreciation of different perspectives of the issue. Table 5 shows the percentage of YES answers from maritime administrations, shipping companies and MET institution respondents.

Table 5: Percentage distribution of Yes answers

Q. no.	Maritime administrations	Shipping companies	MET institutions	Average
6	20	53	49	40.7
7	73	35	70	59.3
8	80	88	94	87.3
9	53	no data	85	69

Overall, there are significant differences regarding the competency level of MET instructors (Q.6), the shortcomings of MET instructors (Q.7), and the notions of global minimum requirements with regard to the infrastructure and technologies of MET institutions (Q.9). On the other hand, a large majority of all three groups agree that there should be a global minimum standard of qualifications and experiences for MET instructors (Q.8).

As Table 5 shows, the minority of maritime administration respondents are satisfied with the current global competency level of MET instructors. In contrast, almost half of the shipping companies and MET institution respondents are satisfied with the competency level of MET instructors (Please refer to Chapter Five to recall the similarity between dissatisfactory reasons identified by them).

The respondents show different opinions on the shortcomings regarding the current global competency level of MET instructors (Q.7). The majority of maritime administrations and MET institutions respondents believe that there are many shortcomings. In contrast, the minority of the shipping companies respondents believe

that there are many shortcomings regarding the competency level of MET instructors (Again, please refer to Chapter Five for specific shortcoming reasons noted).

The results indicate that the majority of MET institutions have a quality system addressing MET instructor selection, competence, upgrading and performance (Q.1[a]/Appendix D). Additionally, they offer training or updating courses for MET instructors (Q.4/ Appendix D) and they have specific criteria to measure their competence and performance as stated in Chapter five. Nevertheless, Table 5 shows, only 49 percent of MET institutions are satisfied with the competency level of MET instructors and 70 percent of them believe that there are many shortcomings.

Table 5 shows, in regard to questions six and seven, a contradiction in Yes percentages, although, there is clearly a similarity between dissatisfactory and shortcoming reasons which are identified by the respondents.

Table 5 also shows a high degree of unanimity about having a global minimum standard of qualifications and experiences for MET instructors (Q.8). As noted in Chapter Five, many of the respondents offered a number of reasons behind this desire. They firmly supported the notion that MET instructors should be appropriately qualified and experienced.

Only two groups of respondents, maritime administrations and MET institutions, were asked question number nine, about having global minimum requirements regarding the infrastructure and technologies of MET institutions. The results for these two groups were quite different. A slight majority (53%) of the maritime administrations respondents believe that it is a good idea but, for economic reasons, very difficult to achieve. As one respondent wrote, “It can not be compulsory yet. Some countries are not prepared to ask private sector (MET institutions) to have expensive technology

equipment in place." Another response was very similar, "there is a merit, but the challenge will arise from differences in the funding that each institution receives."

As Table 5 shows, a large majority of MET institutions saw great merit in this idea, with 85 percent supporting it. Their reasons (as expressed in Chapter Five), included but were not limited to the following: The need to use computer aids, the desire to avoid substandard practices, the creation and maintenance of global standards, and the ability to evaluate training programs. It is perhaps understandable that the institutions responsible for MET training and education are the most concerned with providing the best possible resources.

Thus this research is limited in one aspect: It would have been beneficial to have asked the other two groups, shipping companies and seafarers, for their responses to question number nine. For one thing, it would have been informative to determine how committed shipping companies might be to helping provide the infrastructure and technology needed for quality education. Future research might follow up on this possibility. As for the seafarers, it is highly likely that they would be in favour of having the best possible facilities in their programs (Please see Chapter Seven for further discussion of the limitations of this research).

While all shipping companies recognize the great impact of MET instructors on seafarers' competence (Q.11/Appendix B), it is significant that almost half (53 %) sponsor MET instructors for value-added courses to their level of competency (Q.5/Appendix B). Given such conditions, it is not likely that there will be great changes in the near future.

Although IMO's Technical Co-operation Programme gives priority to technical assistance programmes that focus on human resources development and institutional

capacity-building, the graduated students and research activities at present in IMO education institutions (WMU, IMO/IMA and IMLI) are not sufficient to support MET.

The majority of maritime administrations did not have criteria to select MET instructors and to measure their performance (Q10 and Q11/Appendix A). It is evident from this research that there is no correspondence between the respondents who have these criteria, and they do not have any inclusive processes to ensure that MET instructors are updated on a regular basis.

Generally, it is crucial that MET institutions worldwide become technically highly equipped. Nevertheless, education and training in the maritime sphere is conducted within vastly different infrastructures. MET institutions do not have appropriate resources to increase the availability of sufficient and expensive equipment (Muirhead, 2004). Perhaps, this is an issue for the politicians to allocate funding and show an interest in MET. Moreover, it is important that MET institutions worldwide become highly specialized. Unfortunately, many MET institutions do not have specialized, highly trained and high technically educated instructors due to the unattractive terms and conditions of employment (Muirhead, 2004).

CHAPTER SEVEN

7. LIMITATIONS OF THE RESEARCH, RECOMMENDATIONS AND CONCLUSION

Subsequent to identifying and examining the stakeholders' think from their responses, analyzing and assessing the current global MET situation in regard to MET instructors. This chapter will present the limitations of the current research, make recommendations for MET, and suggest avenues for future research. It will conclude with the author's comments and observations.

7.1. Limitations of the Current Research

Although it was planned and carried out with the best of intentions, the current research is still, in some ways, limited.

To begin, as noted earlier in Chapter Four, the return rate of responses was 29 per cent. While in some ways this might be considered a fairly strong rate, I would have preferred a larger data base**.** There were other examples of difficulties with the questionnaires. Some did not answer the entire Yes/No questions. Others failed to provide their opinions about some questions.

I can only speculate, but several reasons might have led to these gaps in the responses. First, given that the questionnaires were sent to 35 countries, many of which do not have English as a first language, it is possible that some respondents did not feel comfortable either reading the questions or replying to them in English, their second language. While I realize that all in the maritime profession are theoretically able to use English, it may be the case that for some, the difficulty may have caused them not to respond.

Second, it may also be true that some non-respondents did not feel comfortable revealing what they considered to be confidential or even potentially embarrassing information. It is true that anonymity was guaranteed, but there were, in fact, several respondents who preferred to submit their responses via regular mail, in order to preserve their anonymity, even from me.

Further, is always possible that some people found themselves too busy to respond, or that some did not see the issue as important. In this case, it may be possible in future surveys to provide more possible answers to be checked rather than to have some open-ended questions. It is also possible that they felt it unlikely that the research would change the situation, and so chose not to respond.

As a result of the smaller sample size, the conclusions I have drawn are therefore not as strong as they might otherwise have been with a larger database.

7.2. Recommendations

This research has identified a diversity of issues that are considered to have a great influence on the improvement of the MET system as a whole and in particular on the competence MET instructors. No one questions the importance of the issue of improving the quality of MET instructors, but the question now is how, practically, to achieve the optimal result? Benton (2005, p. 353) states that “In order to be a learned, successful, and valuable participant in the rapidly changing global community, students need more than a professional or vocational training.”

In accordance with the research findings, and taking into account my experience in the maritime field, I propose the following recommendations to further improve the competence of MET instructors and the future efficacy of the global MET:

1. MET institutions, shipping companies, port authorities, maritime administrations, representatives from the other branches of the maritime industry, international

organizations and funds, and so forth, should co-operate in a closer manner to find what is essential to improve the MET situation with regard to MET instructors.

2. MET institutions should co-operate and should globally harmonize their curriculum to develop the basis for future worldwide MET instructors. Co-operation between MET instructors, including exchange programmes, is the best way to get new ideas to develop their work and to end by achieving success within the global MET system.
3. MET institutions should help their instructors to look for close communication and cooperation with other industry stakeholders and administrations in order to make themselves more useful for the maritime sector. Additionally, this will help them remain up-to-date with developments in the maritime sector.
4. The curriculum of maritime institutions should be frequently upgraded, should be more practical and technical assistance for MET instructors should be sought.
5. MET institutions should be jointly funded and receive particular assistance and attention from donor governments and the maritime industry stakeholders which is the key to enable them to have competent MET instructors and to facilitate their improvement.
6. International and national funding mechanisms should be created to provide systematic support and assistance to enhance the competence of MET instructors.
7. MET institutions should have minimum standards of qualifications and experience for their instructors which are globally appropriate.
8. MET institutions must properly implement their quality control systems, evaluate themselves and make great efforts to enhance their assets as a whole and in particular their instructors to properly implement, apply and enforce the relevant requirements.
9. MET institutions should help their instructors to develop their fundamental pedagogical skills by given them the opportunity to attend appropriate induction courses. In addition, instructors must be conscious of related issues such as learning

psychology, developing courses for students, management skills, teaching techniques, the use of standard instructional media, assessing students and evaluating courses.

10. As a starting point, the safety culture and environmental awareness must be strongly raised among MET instructors.
11. MET instructors should be ready and willing to constantly meet the requirements of new legislation and new technologies, to meet the demands of the shipping industry stakeholders and to keep pace with maritime industry developments, through practice at sea (maintain a valid CoC) and in the shore-based industry.
12. MET instructors should have time for self improvement by reading professional and industry journals, participating seminar, symposiums and conferences, following external study programmes, developing curricula, participating in departmental projects, preparing articles and features for publication, participating in industry committees and working groups, updating information transfer skills, refreshing lecturing and learning transfer skills, documentation and publishing activities and serving in or carrying out projects or research with industry, and other beneficial activities..
13. MET instructors should involve and cooperate in research activities to raise their ability for offering consultancy and research services. Scientific research should be carried out as team work through an international cooperation between MET institutions. MET institutions should develop a research culture among their instructors within a suitable research environment.
14. MET instructors should improve their command of English and be properly familiar with the standard marine communication phrases. They should have an internationally acceptable level of English.
15. Regional maritime universities/centres should be established worldwide and all maritime-related education should be coordinated through those universities/centres. Collaborative approaches between them must come to the fore. They will probably

be branches of WMU under the supervision of the IMO Technical Co-operation Programmes.

16. Competent MET instructors must be exchanged between regional and international MET institutions in order to transfer updated information and increase the quality of training.
17. IMO must have effective planning to help many MET institutions; additional resources and technical assistance should be intended for MET instructors.
18. IMO should offer fellowships and give scholarships to MET instructors. IMO educational institutions should increase their student capacity, in particular on MET courses.
19. There is a need to have new IMO model courses and develop the existing model courses to help MET instructors keep pace with the maritime industry developments taking into consideration the new technological aspects.
20. There is a need of formal instructional training programmes for MET instructors in particularly simulator instructors. Moreover, MET institutions should provide adequate resources and facilities for such training.
21. MET institutions must develop a dynamic strategy to perform their role to strive into a changing legislative and technological environment, which presupposes the acquisition of higher competencies for MET instructors. The process of upgrading the MET system, and in particular MET instructors, should be a part of MET institutions' strategic human resource management.
22. There is a need of a policy and measure to be adopted by national maritime administrations to address the reliability and quality of MET in general and MET instructors in particular (to improve teaching qualifications and experience and to update the professional skills of MET instructors on a regular basis).
23. MET instructors have to be properly monitored by the maritime administrations and departments of education which need to have an effective quality system in place.

24. The shipping industry should deputize their professional personnel on a short term basis to MET institutions in order to ensure close cooperation with MET instructors. It is important that MET institutions open lines of communication with all shipping industry activities.
25. MET instructors must emphasize the crew's cross cultural awareness, interpersonal relationships and facilitate team-building exercises to promote healthy working relationships among crew members.
26. MET instructors should be able to use communication technology in association with distance learning methodology. They should be equipped and prepared to provide the necessary communications and computing skills needed by the industry.

Research in the MET instructors' enhancement needs to be highlighted and encouraged; global collaborative financial support for this kind of research needs to be located.

7.3. Future Research

This research illustrates that there is much scope for further research into what precisely are the optimal qualifications and experiences for MET instructors. What precisely is the global situation? A study should be encouraged on how to set and achieve a global minimum standard of qualifications and experience for MET instructors. One further avenue that needs to be investigated is how to assure upgrades for MET instructors.

It is expected that the results of the research, as mentioned above, will assist the shipping industry and maritime clusters to upgrade the competence of MET instructors.

7.4. Conclusion

In view of sustainable development of legislation and technologies, this study has shown that the shipping industry stakeholders share a critical need for competent and upgraded MET instructors.

Upgrading MET instructors requires permanent efforts from firstly, themselves and secondly, from MET institutions and shipping industry stakeholders. It is vital for each MET institution to offer appropriate upgrading programmes to their instructors.

It is also important for each MET institution to keep developing and upgrading their instructors because these will be the major key to the success of MET institutions.

MET instructors should, in addition to providing education and training services, seek to improve techniques, systems and approaches. They have to find new and better ways of doing things and innovating new methods of teaching, training and managing. They should be ready and willing to meet the demands of the shipping industry's stakeholders and to meet the requirements of international and national legislation and new technologies.

Toward accomplishing these goals, the MET community should be more pro-active in persuading governments, the shipping industry, and aid donors to contribute by funding the processes of MET instructors' training and technical development.

Finally, the human resource remains the most valuable asset that any organization holds. MET institutions need to constantly ensure that the knowledge and skills of their human resources are constantly enhanced. The MET instructor's eagerness, desire and ambition for continuous self-improvement are crucial. As Yakushechkina (2002, p. 6) states:

> The lecturer's role should not be limited to that of passive recipient of an 'approved' method, text or syllabus. Rather, the lecturer's role and skills should be developed to ensure that he/she can act as a critically aware and well informed judge of how training tools and methods can be used to best effect…success

> depends on the expertise, enthusiasm of the lecturers themselves and their desire for the constant self-improvement.

The words of Albert Einstein may also be seen to be appropriate: "The world we have created is a product of our thinking; it cannot be changed without changing our thinking." And even those of George Bernard Shaw:

> Life is no brief candle to me. It is a sort of splendid torch which I have got a hold of for the moment, and I want to make it burn as brightly as possible before handing it on to future generations.

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APPENDICES

Appendix A: Maritime administration questionnaire

To help me evaluate this form, please kindly indicate your responses either by placing an '**X**' in the relevant boxes ☐ provided, or by completing the open questions as appropriate.

1. Does the administration encourage feedback from the companies and seafarers about MET institutions?
   ☐ Yes ☐ No
2. Does the administration share the feedback from the industry with MET institutions?
   ☐ Yes ☐ No
3. Is there any actual quality control in place to ensure standardisation with regard to MET instructors?
   ☐ Yes ☐ No
4. Does the administration have specific criteria for simulator and Computer Based Training (CBT) instructors?
   ☐ Yes ☐ No
5. Does the administration offer training or updating courses for MET instructors?
   ☐ Yes ☐ No
6. Are you satisfied with the current global competency level of MET instructors?
   ☐ Yes ☐ No

   Please indicate your reasons.……..
   ……..
7. Are there any shortcomings regarding the competency level of MET instructors?
   ☐ Yes ☐ No

   If "Yes", please state the shortcomings ……..
   ……

8. Do you think there is merit in the idea of having a global minimum standard of qualifications and experiences for MET instructors?

☐ Yes ☐ No

Please indicate your reasons.……

……

9. Do you think there is merit in the idea of having global minimum requirements regarding the infrastructure and technology of MET institutions?

☐ Yes ☐ No

Please indicate your reasons.……

……

10. Does the administration have criteria for MET instructor selection and competence?

☐ Yes ☐ No

If "Yes", please state this criteria.……

……

11. Does the administration have criteria to measure the performance of the MET instructors?

☐ Yes ☐ No

If "Yes", please state this criteria.……

……

12. How do you ensure as an administration that MET instructors are updated with regard to contemporary regulations and technology?

……

Please give any other comments you may have on global MET

……

……

!!Thank You!!

Appendix B: Shipping company questionnaire

To help me evaluate this form, please kindly indicate your responses either by placing an '**X**' in the relevant boxes ☐ provided, or by completing the open questions as appropriate.

1. Do you require feedback from seafarers that you have sent to MET institution?
   ☐ Yes ☐ No
2. Is onboard training more effective than MET institution-based training?
   ☐ Yes ☐ No
3. Do you give importance to the qualification of MET instructors?
   ☐ Yes ☐ No
4. Do you give importance to the experience of MET instructors?
   ☐ Yes ☐ No
5. Do you sponsor MET instructors for any value-added courses to raise them to your required level of competence/performance?
   ☐ Yes ☐ No
6. Are you satisfied with the current competency level of MET instructors?
   ☐ Yes ☐ No
   Please indicate your reasons.……
   ……
7. Are there any shortcomings regarding the competency level of MET instructors?
   ☐ Yes ☐ No
   If "Yes", please state the shortcomings ……
   ……
8. Do you think there is merit in the idea of having a global minimum standard of qualifications and experiences for MET instructors?
   ☐ Yes ☐ No
   Please indicate your reasons.……

……

9. How do you ensure that the competency of your seafarers keep pace with new regulations, technology and global social dynamics?

……

……

10. Do current levels of competency for seafarers meet your requirements?

☐ Yes ☐ No

If "No", please state the reasons.……

……

11. Do you find any relation between seafarer's competency and MET instructors' competency?

☐ Yes ☐ No

12. Do you consider that your company have control over the continued suitability of MET instructors within specific institutions?

☐ Yes ☐ No

If "Yes", how do you go about exerting this control? .....

……

Please give any other comments you may have on global MET

……

……

……

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……

!!Thank You!!

Appendix C: Seafarer questionnaire

To help me evaluate this form, please kindly indicate your responses either by placing an '**X**' in the relevant boxes ☐ provided, or by completing the open questions as appropriate.

1. During your studies in MET institution, did you receive the education and training relevant to your industry needs?
   ☐ Yes ☐ No
2. Are the training needs properly identified by training providers?
   ☐ Yes ☐ No
3. Are the MET instructors aware of culture-sensitivity issues?
   ☐ Yes ☐ No
4. Do the MET instructors make proper use of infrastructure and technology at MET institution?
   ☐ Yes ☐ No
5. Do you prefer Computer Based Training (CBT) as opposed to human instructors as a mode of training?
   ☐ Yes ☐ No
6. In your opinion what would be proper indicators of a good MET instructor?

……..……

7. Did you receive encouragement to write your feedback about your MET institution?
   ☐ Yes ☐ No

Please give any other comments you may have on global MET

……..……

……..……

……..……

!!Thank You!!

Appendix D: MET institutions questionnaire

To help me evaluate this form, please kindly indicate your responses either by placing an '**X**' in the relevant boxes ☐ provided, or by completing the open questions as appropriate.

1. Do you have a quality assurance system in operation?

   ☐ Yes ☐ No

   If "Yes" (please answer the following question):

   Does your quality system address MET instructor selection, competence, upgrading and performance?

   ☐ Yes ☐ No

2. Do you have a process for the development of courses and training materials?

   ☐ Yes ☐ No

3. Do you have systems for evaluating and responding to student's feedback?

   ☐ Yes ☐ No

   If "Yes", does the feedback realistically help in improving future training?

   ☐ Yes ☐ No

4. Do you offer training or updating courses for MET instructors?

   ☐ Yes ☐ No

5. Do you have a policy to upgrade your instructors?

   ☐ Yes ☐ No

6. Are you satisfied with the current competency level of your MET instructors?

   ☐ Yes ☐ No

   Please indicate your reasons.……..

   ……..

7. Are there any shortcomings with regard to the competency level of MET instructors?

   ☐ Yes ☐ No

If "Yes", please state the shortcomings …….

……

8. Do you think there is merit in the idea of having a global minimum standard of qualifications and experiences for MET instructors?

☐ Yes ☐ No

Please indicate your reasons.……

……

9. Do you think there is merit in the idea of having global minimum requirements regarding the infrastructure and technology of MET institutions?

☐ Yes ☐ No

Please indicate your reasons.……..

10. Do you have criteria for MET instructor selection and competence?

☐ Yes ☐ No

If "Yes", please state this criteria.……..

11. Do you have criteria to measure performance of MET instructors?

☐ Yes ☐ No

If "Yes", please state this criteria.……

12. How do you ensure that both the curriculum and instructors are kept updated with respect to new regulations, technology and global social dynamics?

……..

13. Are MET instructors aware of culture-sensitivity issues?

☐ Yes ☐ No

Please give any other comments you may have on global MET

……

……

!!Thank You!!

Appendix E: A worldwide representation of countries that have responded to the questionnaires (* indicates responded to the questionnaires)

No.	Countries	Maritime administrations	Shipping companies	Seafarers	MET institutions
1	Algeria			*	
2	Australia				*
3	Bahamas	*			
4	Belgium	*			
5	Brazil			*	
6	Canada	*			*
7	Chile	*			*
8	China	*	*	*	*
9	Colombia		*		
10	Cuba		*		
11	Cyprus	*			
12	Denmark	*		*	*
13	Egypt	*	*	*	*
14	France			*	*
15	Germany			*	*
16	Ghana				*
17	Gibraltar	*			
18	Hong Kong	*			
19	India		*	*	*
20	Indonesia				*
21	Japan	*	*	*	*
22	Jordan				*
23	Kuwait		*	*	
24	Liberia		*	*	
25	Lithuania				*
26	Netherlands			*	*
27	Norway		*		*
28	Pakistan				*
29	Panama		*		
30	Philippines			*	
31	Saudi Arabia		*	*	
32	Sri Lanka				*
33	Sweden	*			
34	Thailand		*		
35	USA				*