An analysis of advanced training courses beyond the requirements of STCW and applications in Myanmar

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An analysis of advanced training beyond the requirements of STCW and applications in Myanmar

By

Thu Rain Win
Myanmar

A dissertation submitted to the World Maritime University in Partial Fulfilment of the requirements for the award of the degree of

MASTER OF SCIENCE
In
MARITIME AFFAIRS

(MARITIME EDUCATION AND TRAINING)

2018
Declaration

I certified that all 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):  ......................................................

(Date):  18 September 2018.

Supervised by:  Dr. Michael Ekow MANUEL

Supervisor’ affiliation:  Maritime Education and Training (MET)
World Maritime University
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Abstract

Title of dissertation: An analysis of advanced training courses beyond the requirements of STCW and applications in Myanmar

Degree: Master of Science

This work studies the development of advanced training courses beyond the requirements of STCW.

A brief look is taken at the nature of the shipping industry and human involvement in the industry to understand the background of the shipping industry. The historical development of international regulations relating to the global seafarers’ training is interrogated to clearly understand how seafarer training courses were developed globally. The influences of international measure on training courses of seafarers are examined. The requirements regarding using Quality Standards Systems (QSS) to control and monitor effectively the sustainable development of training courses are analysed.

Data relating to advanced training courses developed by selected maritime countries and the factors considered in the development of such courses were collated and analysed to create a framework for the development of advanced training courses. Seafarer training in Myanmar was then studied to apply the framework into the development of advanced training courses in Myanmar.

KEYWORDS: Advanced training courses, STCW, QSS, ISM, quality seafarers, MET, sustainable development.
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<tbody>
<tr>
<td>DMA</td>
<td>Department of Marine Administration</td>
</tr>
<tr>
<td>ECDIS</td>
<td>Electronic Chart Display and Information System</td>
</tr>
<tr>
<td>IALA</td>
<td>International Association of Marine Aids to Navigation and Lighthouse Authorities</td>
</tr>
<tr>
<td>III Code</td>
<td>Implementation of IMO Instrument Code</td>
</tr>
<tr>
<td>IMCO</td>
<td>Inter-Governmental Maritime Consultative Organisation</td>
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<tr>
<td>IMDG Code</td>
<td>International Maritime Dangerous Goods Code</td>
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<tr>
<td>IMO</td>
<td>International Maritime Organisation</td>
</tr>
<tr>
<td>ISO</td>
<td>International Organisation for Standardization/ International Standard Organisation</td>
</tr>
<tr>
<td>MARINA</td>
<td>Maritime Industry Authority</td>
</tr>
<tr>
<td>MarTID</td>
<td>Maritime Training Insights Database</td>
</tr>
<tr>
<td>MCA</td>
<td>Maritime, Coastguard and Agency</td>
</tr>
<tr>
<td>MET</td>
<td>Maritime Education and Training</td>
</tr>
<tr>
<td>METIs</td>
<td>Maritime Education and Training Institutes</td>
</tr>
<tr>
<td>MMMC</td>
<td>Myanmar Mercantile Marine College</td>
</tr>
<tr>
<td>MMU</td>
<td>Myanmar Maritime University</td>
</tr>
<tr>
<td>QSS</td>
<td>Quality Standard System</td>
</tr>
<tr>
<td>SOP</td>
<td>Standard Operation Procedure</td>
</tr>
<tr>
<td>STCW</td>
<td>The International Convention on Standards of Training and Certification</td>
</tr>
<tr>
<td>VET</td>
<td>Vocational Education Training</td>
</tr>
<tr>
<td>VTS</td>
<td>Vessel Traffic Service</td>
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</table>
1. Introduction

1.1 Background

The international shipping industry is a global industry, in which human beings are involved in various sectors such as shipboard operations, shore-based operations and port operations. There are different categories of maritime professionals such as port managers, maritime officers, engineers, economists, lawyers, shipbrokers, charterers, and naval architects (El Ashmawy, 2012). However, this paper focuses on the quality of seafarers who are working on board ships.

Seafarers who are working on board ships should be competent and qualified to perform their tasks on shipboard operations smoothly and to ensure maritime safety, security and environmental protection. According to the United Kingdom Maritime Accident Investigation Board (MAIB), 82% of ship-related accidents are directly associated with human error compared to 85% as represented by the Australian Transportation Safety Bureau (ATSB) and 84% according to the Canadian Transportation Safety Board (TSB Canada) (Baker & Seah, 2004). A Dutch study of 100 marine casualties found that human error contributed to 96% of accidents. Human error contributes to 84-88% of tanker accidents, 79% of towing vessel groundings and 89-96% of ship collisions (Apostol-Mates & Barbu, 2015).

In order to reduce the risk of accidents caused by the human element, automated systems such as Integrated Bridge System (IBS), Integrated Navigation System (INS) and Electronic Chart Displays and Information System (ECDIS) have been introduced (Bielić, Hasanspahić, & Ćulin, 2017). The drive towards automation seeks to reduce reliance on the human element in the shipping industry. It can be argued that an increased level of automation accompanied by reducing manning levels should lead to more time and effort in ensuring that seafarers are familiar with the automation system.
Familiarisation training for a specific type of equipment should be required to integrate the automation system into the shipboard operation properly and effectively.

The shipping industry is a global industry which is driven by multinational crew on board ships. It is estimated that approximately 70-80% of world merchant fleets are operated by multinational crews (Magramo and Cellada, as cited by Pazaver & Kitada, 2018). Effective communication is important for safety, shipboard operation, ship-to-ship communication and ship-to-shore communication due to misunderstandings that may arise among multicultural crews, which may in turn lead to maritime accidents. Hence, intercultural communication in English is essential for maritime professionals both on board and ashore. Although the English language is required as the common language in ship-to-ship communication and ship-to-shore communication in accordance with SOLAS V/Reg.14, the specific level of English language skill is not stated in international maritime conventions (IMO, 2014). Non-native English-speaking countries should therefore teach English language skills for effective communication on board ships to subjectively determined adequate levels. In addition to language skills awareness training such as for cultural awareness is required for safety on board ships.

To eliminate human errors, the relevant stakeholders should take appropriate actions in advance. Maritime Education and Training (MET) is a proactive mechanism in the shipping industry to reduce the unnecessary accidents and incidents happening in the industry and optimise competence. Seafarers’ training courses follow the international mandatory standards required by the International Convention of Standards of Training Certification and Watchkeeping (STCW) 1978, as amended, which is a unique international standard for the training of seafarers. However, the STCW Convention sets minimum requirements and minimum standards of competence to be met globally by all the different education systems of maritime nations. Seafarer

1 International Convention for the Safety of Life at Sea, 1974, Chapter – V: Safety of navigation, Regulation – 14: Ships’ Manning
training courses should at the least meet the minimum requirements and minimum standards of competence in the STCW Convention and Code.

Some maritime nations have been developing advanced training courses beyond the requirements of STCW for certain types of ships, equipment and certain types of operations. For instance, dynamic positioning operator training has been developed in some maritime nations, but it is not mandatory training for seafarers as per STCW.

Training courses for seafarers should be designed systematically as per requirement of STCW. In accordance with STCW Reg. I/8, administrations shall continuously monitor the training courses developed by approved training institutes. Administrations shall issue and endorse the certificates of seafarers as per the requirements of STCW Reg. I/2 (IMO, 2017a). The administration is the regulatory body which controls and monitors the training courses and issues most certificates of seafarers. Administrations disseminate the subordinate legislation for the training courses and the issuing and endorsing of the certificates of seafarers (Mukherjee & Brownrigg, 2013).

In the MET sector, the maritime administration, METI and shipping industry are interrelated. The maritime administrations are supposed to monitor the effectiveness of mandatory training courses required by STCW continuously. METIs implement the training courses including mandatory and non-mandatory courses for the needs of the shipping industry. The shipping industry (shipping companies) support the continuous professional developments of seafarers.

Myanmar, as a seafarer supply country, needs to consider relevant advanced training courses to keep abreast of the changes in the shipping industry. This research work is intended to result in a framework that could be applied to the development of advanced training courses in Myanmar.
1.2 Problem statement

The rapid growth of technologies, multicultural crews on board and minimum safe manning all influence shipboard operations and shipboard organisation significantly. The shipping industry is seeing an increased level of automation system accompanied by a reduced number of seafarers. However, the shipboard operations should be facilitated and enhanced for the safety, security and environmental protection of the oceans. Shipowners and shipping companies expect to employ highly competent seafarers who meet and exceed the mandatory standards of competence set out in international law for a quality shipping industry. Myanmar is trying to improve its training programs to enhance the quality of its seafarers globally. To develop advanced training courses in Myanmar, current shipping industry trends should be analysed together with other relevant factors affecting MET in order to develop advanced training courses. Although IMO gives the guidance with the model courses to develop mandatory training courses, there is no specific guideline for other advanced training courses beyond the requirements of STCW. It is argued here that there should be a framework to develop the advanced training course.

1.3 Motivation

The fast growth of technologies also influences the skills of instructors. Conservative instructors hold to the use of traditional teaching aids and ignore the use of advanced technologies. They are also not always confident in using advanced technologies. The instructors should be motivated and upgraded training in the use of advanced teaching aids should be arranged for them. The challenges to METIs in some countries, particularly in Myanmar, include a lack of infrastructure and efficient human resources. The qualification requirements for instructors, supervisors and assessors are stated in STCW Section A-I/6 as follows:

“instructors, supervisors and assessors are [to be] appropriately qualified for
the particular types and levels of training or assessment of competence of seafarers either on board or ashore, as required under the Convention, in accordance with the provisions”.

Thus, efficient human resources in METIs are also crucially important for developing training courses.

In Myanmar, as a seafarer supply country, the number of ship officers is 14,528 and there are 46,640 ratings who serve on board ships as at August, 2018 (DMA, 2018). These seafarers should be quality seafarers to serve in the quality shipping industry. Maritime administration and METIs are significantly important to supply the quality seafarer to the industry. In Myanmar, METIs are separated under different sectors: the government sector and the private sector. Myanmar Mercantile Marine Colleague (MMMC) and Myanmar Maritime University (MMU) develop cadet training courses mainly under the auspices of the government. Myanmar Excellent Stars-Maritime Training Centre (MES-MTC), Brilliance Maritime Training Centre (BMTC), Pacific Glory International (PGI), Win Ye Kyaw Services Company Ltd, Wise Wish Marine Engineering Training Centre and Myanmar Marine Engineers’ Association Training Centre (MMEA) are the main private training centres which offer training courses for navigation officers and engineers. There are other private training centres offering mandatory training courses required by STCW for Certificate of Proficiency (CoP).

Some young seafarers attend cadet training courses which are offered in MMMC and bachelor of science courses in MMU to become seafarers. Others attend basic safety training courses to become seafarers. Young people in Myanmar are keen to become seafarers due to they believe that seafarers can support enough finance for their families. METIs need to design and align the training courses with the needs of shipping industry to enhance the supply of seafarers whose competencies are deemed relevant to the industry.
1.4 Aim and objectives

The aim of this paper is to analyse the relevance of training beyond STCW requirements and to suggest a framework for such training to address quality issues in the supply of seafarers. Administrations and training institutions should enhance the quality of seafarers by giving advanced training programmes beyond the requirements of STCW. To develop the advanced training courses effectively for the needs of the shipping industry, the following objectives are identified in this paper. The objectives of this paper are:

1. to identify advanced training programmes beyond STCW offered by seafarer supply countries;
2. to understand what factors are considered for the determination of which course to run and;
3. to develop the framework for the identification, delivery and evaluation of advanced training courses beyond STCW.

1.5 Research questions

The following research questions are asked to cover the three areas, namely administration, training institutes and seafarer supply companies.

1) What advanced training courses beyond STCW are offered by different jurisdictions?
2) What factors are considered in the identification and development of such advanced training courses?
What framework can be developed for the decision making about identification of curriculum development and evaluation of such courses?
2. Literature review

2.1 Shipping industry

People and communities around the world rely on the shipping industry. The shipping industry is a backbone of critical economic activities to achieve sustainable development as ships transport essential items, such as food, goods, natural resources and energy (Kitada & Bolmsten, 2018). The shipping industry is a service industry that has to reach every sector of the community. International shipping industry transports more than 80% of world trade to people and communities all over the world (IMO, 2018a). There were 93,161 vessels trading globally as at 1 Jan 2017. They carried about 1.86 billion dwt to people and communities (UNCTAD, 2017).

The shipping industry is a progressive industry; turbulent and challenging. The shipping industry has rapidly grown after World War II (Ma, 2016). Size and type of ships and technologies in the shipping industry are dramatically changing due to the demands of the global market. The shipping market is a globally competitive market that does not care about borders. Multinational crews have become part of a global market which is a question of money (Berg, Storgård, & Lappalainen, 2013). It is difficult for shipowners to regulate the fuel cost, insurance and port dues among other variable costs. Therefore, shipowners often try to reduce overall cost by reducing crew costs. The crew cost can be 15% of the total operation and running costs and can be up to 42% of the operating costs (Stoford; 2009, as cited in Berg, Storgård, & Lappalainen, 2013). Shipowners can reduce the crew costs by registering the ship under “open register” flags such as Panama, Liberia and Singapore. The crew costs vary according to the flag of the ship. The standards of training of seafarers also vary because the countries have different policies, legislation, social background, and education systems. The question here is how to develop the standards of training globally for multinational seafarers. IMO officials attempted to set the standards of training for seafarers (Wilcox, as cited in Emad & Roth, 2008). The first international
set of standards of training, certification and watchkeeping for seafarers (STCW) was adopted on 7 July 1978. The details of seafarer training evolution is discussed in the following section on Seafarer Training.

IMO also adopted another international measure relating to the human element, namely the International Safety Management (ISM) Code, which entered into force on 1 July 1998. It assists seafarers and ship owning/management entities to manage the safety of shipboard operations. Even though the regulations are adopted to reduce accident, accidents still happen in the shipping industry. Most accidents are caused by human error. The most severe problems in the human factor analysis are fatigue, lack of communication and coordination between the crew, as well as poor technology skills concerning, for example, the use of radar (Rothblum, 2000, as cited in Berg et al., 2013).

MET plays a significant role in reducing the number of accidents and in promoting safety at sea, protection of the environment (marine and air), and economical ship operation. MET is a proactive sector in the industry to avoid accidents and adverse incidents. The training courses should relevant to the reality of shipboard operations: at the right place at the right time. Competency of seafarers is one of the most important aspects to achieve sustainable development of the industry (El Ashmawy, 2012).

### 2.2 Seafarer training

Seafarer training is one of the aspects of the Vocational Education Training (VET). VET is driven by several factors, namely global economy, industry, restructuring and government policy initiatives. On the other hand, training always keeps on changing with technology and science (Basak, 2017).
In almost all maritime nations, operational education and training for seafarers originated from the on-the-job training paradigm (Manuel, 2017). The first international regulation relating to the requirements of training and certification of seafarers was undertaken under the auspices of the International Labor Organization (ILO) via the Officers' Competency Certificates Convention (ILO C53) of 1936. Article 3 of ILO C51 required “No person shall be engaged to perform or shall perform on board any vessel to which this Convention applies the duties of master or skipper, navigating officer in charge of a watch, chief engineer, or engineer officer in charge of a watch, unless he holds a certificate of competency to perform such duties, issued or approved by the public authority of the territory where the vessel is registered”. However, ILO C53 did not state the standard requirements of training and certification (ILO, 1936). Governments established their own standards and procedures of training, certification and watchkeeping of seafarers individually. So, standards and procedures for seafarer training are widely varied (Alop, as cited in Emad & Roth, 2008).

Indeed, the shipping industry needed an international standard of training and certification system for seafarers because the industry was trading globally with multinational seafarers. In 1948, the United Nations established the Inter-Governmental Maritime Consultative Organization (IMCO) to deal with the maritime affairs. The name was changed to International Maritime Organization (IMO) in 1982 (IMO, 2018b).

The first purpose of IMO was to improve safety by improving technical aspects of shipping (Emad & Roth, 2008). Nevertheless, IMO adopted the first international level of standards of training, certification and watchkeeping for seafarers on 7 July 1978. It was called the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW 1978). It came into force on 28-Apr-1984 (IMO, 2017a). All standard requirements were to be to “the satisfaction of administration” and this wording was too vague in implementing the standards. Furthermore, the
original STCW 1978 had limitations with respect to requirements for skills and an almost exclusive focus on knowledge. In STCW 1978, IMO had no oversight to the party states.

In 1995, there were major amendments made to the STCW 1978 Convention, which entered into force on 1 February 1997. The STCW 78, as amended in 1995 included standards that required all-party states’ administrations to communicate and report their implementing processes to the IMO Secretary General and maintain a database with data related to certain requirements of the convention. The IMO Secretary-General was required to announce the list of party states who were giving full and complete effect to the convention – the so called 'White List'. The 1995 amendments also included the addition of quality standards and standards for the qualification of instructors and assessors. The structure of STCW 78 was totally changed. A new STCW Code-A (Mandatory) and Code-B (Guidance) was introduced. The 1995 amendments defined the responsibilities of administration clearly and allowed for a careful monitoring process of the implementation process of party states by IMO.

The Manila amendments of 2010 brought new challenges to Maritime Education and Training. STCW 1978, as amended in 2010 (Manila amendments) included mandatory training in modern technology such as Electronic Chart Display and Information System (ECDIS), leadership and teamwork, environmental awareness, liquefied gas tankers and allowed the use of distance learning and web-based learning methods for training in appropriate competences (Fishers & Murihead, 2013).

By reviewing the evolution of STCW in the past years, it is clear that some training requirements were amended based on the current issues occurring in the shipping industry. In STCW 1978, most training courses were not included for simulator training, but it is added in 1995 amendments. In 2010 Manila amendments, ECDIS training and special training requirements for liquefied gas carrier were added. However, in recent years, digitalization technology is dramatically changing the
shipping industry and seafarers should require more technical knowledge to operate ships safely and efficiently. Arguably, international regulations evolve at a slower pace and it can be argued that it is proactive MET training that should ensure that seafarer training continues to meet industry requirements more speedily.

2.3 ISM related to seafarers

The two international measures – the STCW Convention, as amended, and the ISM Code, more than any others, are designed to influence and to shape the human element in shipping (O’Neil, 2003). The STCW convention and ISM Code provide a set of practices and a safety system which will enhance the safety at sea and environmental protection for the future of the shipping industry. The essence of the ISM Code is its distinct focus on the human element. The majority of accidents happening in the shipping industry are caused by human error. Most accidents happened by somebody who did not take the proper action in time or somebody who took the wrong action whether through boredom or carelessness due to the edge of routine, ignorance, fatigue, or stress (El Ashmaway, 2012). The Standard Operation Procedures (SOP) included in the ISM Code give guidance to seafarers to facilitate the onboard tasks. ISM bridges the gap between acquired knowledge from the institutes and its application to practice.

ISM and STCW are interlinked with each other. The purpose of ISM is to assist the seafarers to facilitate the shipboard operation for safety, security and environmental protection of cleaner oceans. The purpose of STCW is to provide more knowledge and skills for the effective and efficient shipboard operation. In the new millennium, IMO has highlighted the dominant role of the human element, with the adoption of the ISM Code and the STCW Convention as amended, in safety at sea and environmental protection (O’Neil, 2003).
2.4 Incident and accident causation

Even though MET is a proactive sector, the curriculum will be designed and adapted also based on the incidents and accidents happening in the industry. MET must keep in focus what is required in the training of seafarers on board ships. Hence, the MET sector will examine the accidents and incidents happening in the industry. This section briefly examines some incidents and accidents that happened in the shipping industry.

Firstly, this paper examines the M/V Cosco Busan accident that happened in the San Francisco Bay. National Transportation Safety Board (NTSB), 2009 states that:

On November 7, 2007, about 08:30 Pacific standard time, the Hong Kong-registered, 901-foot-long containership M/V Cosco Busan collided with the fending system at the base of the delta tower of the San Francisco–Oakland Bay Bridge. The ship was outbound from berth 56 in the port of Oakland, California, and was destined for Busan, South Korea. As a result of the breached fuel tanks, about 53,500 gallons of fuel oil were released into the San Francisco Bay. No injuries or fatalities resulted from the accident, but the fuel spill contaminated about 26 miles of shoreline, killed more than 2,500 birds of about 50 species, temporarily closed a fishery on the bay, and delayed the start of the crab fishing season. Total monetary damages were estimated to be $2.1 million for the ship, $1.5 million for the bridge, and more than $70 million for environmental clean-up (p. 1).

In this case, the nationality of onboard crew members was Chinese and the pilot was American. The vessel sailed from berth in restricted visibility without the pilot being properly familiar with ECDIS. Effective communication between the pilot and crew members, and the pilot and Vessel Traffic Service (VTS) operator was not established for on board operation and navigation.

Although crew members have the competency to perform the tasks on board ships, accidents are still happening in the shipping industry. It is clear that soft skills, such as attitude, leadership, team work, culture awareness, language skills and effective
communication are also important on shipboard operations.

Technology has been rapidly growing in the past two decades. Risks are also increasing together with the technology growth. To reduce the risk to a minimum, training courses always need to be updated in line with technology developments. In the era of digitalisation, the usage of cyber space is crucially important globally. Every user needs to be aware of the freedom of cyber space. The shipping industry was suffering cyber-attack risks when digital technology was rapidly growing. The shipping industry suffers 14% of global cyber-attacks ("Perspectives on the", 2017).

Two high-profile cyber-attacks happened in the container shipping industry. On June 27, 2017, A.P. Moller-Maersk’s computer system was attacked by Petya, which caused outages at its computer systems across the world. The breakdown affected all business units at Maersk, including container shipping, port and tug boat operations, oil and gas production, drilling services, and oil tankers (Gronholh-Pedersen, 2017). Maersk lost about $300 million in revenue by the NotPetya cyber-attack (Novet, 2017). It was an obvious sample of cyber-attack risk in the shipping industry.

On 27 July 2018, another high-profile cyber-attack happened again in the shipping industry. COSCO operations in North America, where it operates a key container terminal in California, was breached by a cyber-attack. COSCO reported a cyber-attack that brought down its email system and disrupted telephone communications at its customer service centre near Los Angles in the US. Ships are not islands, they are not self-contained units. Shore- and ship-operations are cyber-connected. If shore-based and ship-based IT systems are linked, it could open a gateway to the ships (Wingrove, 2018).

Cyber-attacks on container shipping and terminals have become an increasing issue for the industry to deal with (Wingrove, 2018). In modern maritime economics, a data networking system is crucially important in the container shipping market. If the data
network is broken down in the container shipping, most revenues can be lost. Ship owners and operators should ensure that preventive action should be taken to protect cyber-attack risks. All stakeholders and member states of the IMO also discussed cyber risk management. IMO adopted Resolution MSC.428(98) Cyber risk management in Safety Management System on 16 June 2017. Administrations shall ensure that cyber-risk are appropriately addressed in Safety Management System (SMS) no later than the first annual verification of the company's Document of Compliance after 1 January 2021 (IMO, 2017b). It will also challenge training institutions because they should prepare the training courses in advance to meet the ship-owners’ expectations.

2.5 Advanced training courses beyond the requirements of STCW

The mandatory requirements of standards of competence in STCW 1978, as amended, emphasise the knowledge and skill acquisition. Ideally, according to Bloom (1956), three domains should form the objectives of an education system: cognitive, psychomotor and affective. There is a perception that STCW 1978, as amended, ignores the affective domain\(^2\) of learning (Manuel, 2005, p. 5). Seafarers should be motivated, i.e. the training courses should not be considered just a process to gain the certification so that employment opportunities will be available, but should be felt as the acquisition of knowledge and skills for a conscientious protection of human life, the seas and the cargo entrusted to their care (Manuel, 2005).

The seafaring professional is a specialised professional, who has to meet the requirements of both shipping companies and international maritime regulations (Shicheng, 2009).

In this paper, the advanced training course is generally defined as the training course

\(^2\) Affective domain: attitude, values and ethics (Manuel, 2005, p. 9).
that is required to facilitate the shipboard operations for certain types of ships, certain types of equipment and the shipboard organisation, but which is not a mandatory training course required by the Convention. The STCW 1978 Convention, as amended, states only the minimum standards of training, certification and watchkeeping for seafarers. The party states should fully and completely implement the minimum standards required by the Convention. As has been discussed previously, current issues such as quick advance in technology (e.g. related to cyber-security and affective education) may need to be addressed through training beyond the requirements of the STCW in its current form. Shipping companies demand to get the quality seafarers to facilitate the shipboard operation and shipboard organisation. They expect the quality of seafarers to be adequate for their purposes even when the relevant competences are beyond those required under the mandatory minimum standards of competence required by STCW. To align seafarer training courses with the needs of the shipping industry, the advanced training courses which include, for example, language, decision making, leadership, organisational knowledge, interpersonal and familiarisation training, specific technological training, cyber-security training etc. for specific ship types should be carefully designed and implemented. Indeed, seafarers should be equipped with the desired skills and proper knowledge of and personal attitudes towards the shipping industry (Lau & Ng, 2015, p. 315).

Today, ships are becoming bigger, faster and more specialised and therefore seafarers are required to be more professional and specialised. METI needs to pay special attention to the quality of seafarers due to the demand of the shipping industry. The quality seafarers refer to those with good experiences on board, excellence in seamanship, computer operations, English language skills, ship management, interpersonal communication, professional virtues and commitment, which are beyond the standards of competences in STCW (Shicheng, 2009, p. 5). The competent seafarer means the seafarer has the competency to demonstrate and perform the standards of competence stated in the STCW Code-A.
2.6 Role of maritime administrations, maritime education and training institutions (METI) and seafarer recruitment companies

The concept of Triple Helix of university-industry-government relations, which initiate a general framework for exploring and high-technology development in the knowledge-based society (Leydesdorff & Ftzowitz, 1996), can be applicable in the context of MET. Maritime administrations, METIs and the shipping industry are interrelated with each other. The MET plays a significant role in the success of the maritime industry in terms of strengthened and amplified cooperation among maritime industry sectors, such as government (maritime administration), METIs and shipping companies that are very crucial for the success of the maritime industry (Basask, 2017, p. 345).

A maritime administration, as a member state of IMO, has the responsibility to implement the international instruments of IMO effectively. The government has to legislate international laws as national laws. The maritime administration is an executive body of the government that assists the government to ensure the implementation of obligations of the country through national policies and laws in order to govern all maritime affairs and shipping related matters (Bellefontaine, 2018). Maritime Administration, as requirements of Part A-I/6 of the STCW Conventions, shall ensure that all training and assessment of seafarers for certification (Certificate of Competency) under the Convention are in accordance with written programmes, whose main attribute should be clear learning outcomes. Maritime administration shall conduct, monitor, evaluate and support the training courses by appropriate qualified instructors, supervisors and assessors (IMO, 2017a).

METI should effectively develop training courses based on the requirements of international regulations, national policies/legislation and shipping industry needs. Maritime education and training are the acquisition of the knowledge and skills related to tasks to be performed on board the ship and have the purpose supplying competent
seafarers to the shipping industry. The challenge of METI is to examine how they will use resources efficiently and effectively to achieve the learning outcomes of training courses (Fisher & Muirhead, 2013).

The shipping companies, in some countries, appoint or hire the local crew agencies (Seafarer Recruitment Companies) to employ seafarers. The crew agencies link up seafarers to the shipping companies. Some shipping companies ask seafarers to attend some specific training required as per company policies or onboard operations. The crew agencies arrange these training courses for seafarers. Seafarer supply companies need to know the present requirements of the shipowners. Figure 1 shows the interlink of Maritime Administration, Maritime Education and Training Institutes and the shipping industry and how their roles relate to seafarers.

Figure 1. Interlink of Maritime Administration, Maritime Education and Training Institutes and Shipping Industry
2.7 Quality Standard System (QSS) for training courses

The mandatory training courses required by STCW should be developed under Quality Standards System of Maritime Administration. In the STCW Convention, Regulation I/8 – Quality standards, imposes that maritime administration should be a Quality Standard System (QSS). As per Regulation I/8, Maritime Administration should clearly define the objectives of training courses and continuously monitor the whole process relating to all training, assessment of competence and certificate issues through QSS. However, the STCW did not define or require any particular QSS under the International Standard Organisation (ISO). Maritime Administration should define an appropriate QSS to cover the scope of the STCW Convention and to achieve the policies of the organisation (Zec, Knežević, & Perčić, 2004).

The aim of any QSS is to establish and maintain the quality of the final product or outcome of the production process. There are two key elements in QSS which are Quality assurance and Accountability. Quality Assurance can be defined as meaning fitness for purpose and accountability can be defined as answerability and enforcement. It is quite clear that the production process of METI is the training courses and programmes while outcomes of the training courses are knowledge and skills acquired during the training courses (Zec, et al., 2004). The acquired knowledge and skills should be fit to perform the tasks assigned on board ships. The advanced training courses should be fitness for purpose, answerability and enforcement. All mandatory training programmes under the STCW Convention are continuously monitored through the Quality Standards System (QSS) to achieve the defined objectives and policies. There are four important steps in the quality standards system, namely: documentation process; compliance with procedures; self-assessment of the operation and independent evaluation by an approved quality authority or body (Fishers & Muirhead, 2013, p-145). The process under QSS is stated in Figure 2.2. The essence of QSS is to continuously develop the quality of seafarers.
2.8 Sustainable development

The UN adopted 17 Sustainable Development Goals (SDGs) in 2015, which build upon Millennium Development Goals. The IMO, as a specialised agency of UN, translated these SDGs to the maritime context. For instance, the IMO’s work also extends to education and training of seafarers under the STCW Convention, which is relevant to SDG 4 (quality education) (Kitada & Bolmsten, 2018).

Economy, society and environment are the major three pillars of sustainable
development. Indeed, the shipping industry is directly and substantially influence by the sustainable development of economy, society and environment. Firstly, the shipping industry trades more than 80% of global trade (IMO, 2018a). The sustainable development of the economy is also relying on the shipping industry because the shipping industry carries the essential things to peoples’ lives with low costs and large volume. Secondly, the shipping industry is also important from the society perspective, particularly in seafarers supply countries because the shipping industry creates a lot of job opportunities for society by employing seafarers and shore staff. It employs 630,400 officers and 906,080 ratings globally (see Figure 3) (Drewry Maritime Research, 2018, p.3). In addition, job opportunities for other professionals related to the shipping industry have also been created. Thirdly, the shipping industry also impacts on environmental issues with various factors. For instance, the shipping industry is in the fifth position of oil used in the world (Figure 4) (Statista, 2018). It impacts the mineral resources, Green House Gas (GHG) emission. There are also other environmental issues related to the shipping industry such as ballast water, anti-fouling paint, ship dumping and ship scrapping.

![Figure 3. World Seafarer numbers, 2012-2018](source_url)

Figure 4. Rankings of oil used in the world
Source from: OPEC, as cited in Statista, 2018.

Cleopatra Doumbia-Henry said in MarTID³ (2018) that,

Education, training and human resource development in general, is critical for the sustainability of any industry endeavour. Well trained and competent seafarers are critical to ship safety and security, as well as to the environmental and commercial sustainability of shipping and by extension of world trade.

It is clear that MET is critically important for the sustainable development of the quality of seafarers and the shipping industry. MET should consider not only the sustainable development of the quality of seafarers and the shipping industry but also the sustainable development of its own system. According to the MarTID Training Practices Report (2018), the top training challenges is a lack of finance resources (see Figure 5).

³ MarTID: Maritime Training Insights Database
While sustainable development in MET does not necessarily imply a profitability, it signifies strategy optimization (Prylipko, 2013). Prylipko (2013, p. 62) recommended the following activities to launch the transition towards sustainable development:

1) to review policies and other strategic documents in order to introduce principles of sustainable development;

2) to proliferate knowledge about sustainable maritime development among managers of MET institutions, lecturers and instructors (train-the-trainer programmes, conferences and seminars on related topics);

3) to analyse the need and possibility for introducing separate programmes on sustainable maritime development or courses within respective programmes;

4) to review the existing curriculum in order to reflect the sustainable maritime development issues:

4.1) to ensure coverage of sustainable maritime development issues in existing courses (hard skills);
4.2) to nurture related cognitive skills including critical thinking, system and complex thinking, envisioning, and problem-solving (soft skills);
5) to encourage research on sustainable maritime development issues.

2.9 Background of seafarer training in Myanmar

Myanmar has an old historical background in the international shipping industry. It became a member of the International Maritime Organisation (IMO) on 17 March 1958 (DMA, 2018). Myanmar signed 18 international maritime conventions in April 2018. Myanmar signed the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978 (STCW 78) on 4 May 1988, which was enforced on 4 August 1988. Myanmar, as a member state, has fully and completely implemented the mandatory minimum standards of STCW.

The Department of Marine Administration (DMA) is an executive arm of the government, which implements the policies relating to maritime affairs. It is under the auspices of the Ministry of Transport and Communication. DMA was established in 1930 when the country was under British colonisation. At that time, the Department of Marine Administration was called Principal Port Officer. Before World War II, the name was changed to Nautical Adviser and Principal Port Officer. Finally, the name was changed to the Department of Marine Administration (DMA) on 16 May 1972 (DMA, 2018). There are nine divisions under DMA to undertake maritime affairs. They are as follows:

- Nautical Division,
- Marine Engineering Division,
- Seafarers Division,
- Legal & Technical Standards Division,
- Maritime Safety, Security & Environmental Protection Division,
- State & Region Offices Division (Upper Myanmar),
- State & Region Offices Division (Lower Myanmar),
- Planning Division and
- Shipping Division.

Of these divisions, the Nautical Division, the Marine Engineering Division and the Maritime Safety, Security & Environmental Protection Division are directly related to training and certification of seafarers. The Nautical Division and Marine Engineering Division define the learning outcomes of training outcomes, continually monitor the effectiveness of training courses and conduct the examinations for deck officers and engineer officers. The Maritime Safety, Security & Environmental Protection Division undertake the issues of Certificates of Competency (CoC) and Certificate of Proficiency (CoP) and they also undertake the recognition of Certificates.

Myanmar is also a historical seafarers supply country in the shipping industry. There are two maritime education and training institutes in Myanmar, ie Myanmar Mercantile Marine College (MMMC) and Myanmar Maritime University (MMU), which are under the auspices of the government. Both institutes primarily focus on the cadet training programmes to attract young people. MMMC gives diploma certificate if the training course is successful. The students get a Bachelor of Science after complete the training programmes. In 1963, the Nautical and Engineering courses were conducted initially at the Naval Training School, Seikyee. It was jointly opened with naval training under the Ministry of Defence, the Ministry of Education and the Ministry of Transport. The Institute of Marine Technology (IMT) was then solely put under the Ministry of Transport and Communication on 15 March 1972. On 25 March 2009, IMT was upgraded to Myanmar Mercantile Marine College (MMMC) (MMMC, 2016). The new maritime university, Myanmar Maritime University (MMU), was temporarily opened in the compound of IMT on 1 August 2002. On 29 March 2004, the Myanmar Maritime University was inaugurated with modern design (MMU, 2018). There is only one maritime university in Myanmar which produces maritime professionals.
In 2010, the first private training institute, Pacific Glory International (PGI), was allowed to be established by the government. Pacific Glory International (PGI), Myanmar Excellent Stars-Maritime Training Centre (MES-MTC), Brilliance Maritime Training Centre (BMTC), Uniteam Marine (YGN) Ltd, Wise Wish Marine Engineering Training Centre and Myanmar Marine Engineers’ Association Training Centre (MMEA) are major private training centres which conduct competency training courses for navigational officers and marine engineers.

Young people in Myanmar are still interested in becoming seafarers. Therefore, the Maritime Administration, METI and the Seafarer Supply Company need to support young seafarers to facilitate shipboard operations in order to prevent accidents on board ships by providing advanced training programmes.
3. Research methodology

3.1 Introduction

This dissertation will develop a framework for decision-making about curriculum development for training beyond the requirements of the STCW Convention and the evaluation of such training. Seafarer training in the maritime industry is unique training compared to other types of vocational educational training. It has international standards of competences which are minimum requirements to be fully complied with by all member states of the IMO. The shipping industry is a rapidly growing industry in the world. Maritime Education and Training should be aligned with the industry’s needs all the time. MET is a proactive sector in the maritime industry in order to reduce the numbers of accidents. Some training is developed as per the requirements of society and industry needs but it is not required as per legal instruments. The researcher is a former seafarer and also a maritime instructor who is working in the maritime training institute. Hence, the researcher has some experiences related to seafarer training. The researcher explored how other major seafarers supply countries develop advanced training beyond the requirements of STCW. The researcher conducted the interviews during the field study trips to the Philippines, Norway and London. The researcher sent the questionnaires to other maritime countries. The data received from interviews and questionnaires are analysed to develop a framework for the decision making about curriculum development and evaluation of such courses. This dissertation is directly related to improving the quality of training of seafarers globally.

3.2 Qualitative research

This dissertation uses a qualitative approach. Ayiro (2012) claimed that an exploratory study examines the key variables, their relationships and their potential or causal linkages. Moreover, exploratory studies are applicable to policy matters. This study examines the advanced training courses which are developed by maritime nations
around the world and identifies the training courses developed in Myanmar. Then a framework is created to be applied for the development of advanced training courses in Myanmar. This dissertation is intended not only for Myanmar but also for other seafaring countries. The advanced training courses observed in this dissertation are linked to the current issues happening in the shipping industry. The research was arranged as follow:

i. To identify the development of advanced training courses beyond STCW in major seafaring countries;
ii. To examine what factors are considered in identification and development of such training course; and
iii. To identify and evaluate what framework can be developed for decision making about curriculum development of advanced training courses.

3.3 Data collection and analysis

Three questionnaires were arranged for maritime administration, maritime education and training institutes and seafarer supply companies. In each questionnaire, there were two sections. The questions in the first section are related to personal information of participants and the second section are related to the applicable sectors. All questionnaires intended to cover the research questions of this paper:

(1) What advanced training courses beyond STCW are being offered by different jurisdictions?
(2) What factors are considered in identification and development of such advanced training courses?
(3) What framework can be developed for the decision making about identification of curriculum development and evaluation of such courses?

The data collection and analysis were conducted with three steps. For the first step, data was collected from the administrations, training institutions and seafarer supply
companies around the world based on the qualitative research approach using interviews and questionnaires. During the field studies, data was collected by interviewing responsible persons, site visits and sending the questionnaires via e-mail. The contacts for potential responses were collected during field studies to IMO, London and from the WMU alumni network. The questionnaires were sent to those contacts. Based on the data received from maritime nations around the world, a first analysis was made to understand basic requirements and availability of advanced training courses beyond the requirements of STCW.

In the second step, data was collected from administrations, training institutions and seafarer supply companies in Myanmar, via e-mails or social media, by sending the questionnaires.

For the third step, the data received via interviews during the field study trips and the data received from questionnaires were combined and analysed. It is possible to evaluate the impact of current issues of the shipping industry on training institutions, which will show the extent of the impact showing how to create the curriculum to meet the current issues of the shipping industry.

3.4 Ethical issues

The research relates to human development. The shipping industry is a global trading industry which employing multinational and multicultural crews. Seafarers on board ship are supplied from different nations. The seafarer supply market is a competitive market in the shipping industry. Drew, Hardman, and Hosp (2008, p. 55) said that “ethics has become a cornerstone for conducting effective and meaningful research”. Research involving human participants must be conducted in a manner that respects the dignity, safety, and rights of research participants (World Health Organization, 2013, p. 3). The World Maritime University Committee research process requires that ethical considerations are made to ensure that no harm comes to participants in any
imaginable way.

A lot of considerations have been taken as to how to select relevant participants for this research in order to enable the discovery of rich and deep information. The study adopted the purposeful sampling method to select participants for the study. Interview data was collected from some countries and examined to identify how they develop advanced training courses beyond STCW. Hence, consent forms were used which stated the overall purpose and any risks or benefits of participating in the research. This also took the confidentiality of the participants into consideration. Further, all data collected from participants was voluntarily and under appropriate organizational data control policies. Data collected are used as they had been given from the source and are not altered or edited in any way.

3.5 Results

After the data were carefully analysed, valuable concepts were obtained for other seafarer supply countries. The training courses should be implemented as per not only the requirements of STCW, 1978 as amended, but also requirements related to current issues in the shipping industry. Some countries have implemented training courses in advance which are not yet specified in STCW,1978 as amended. Therefore, the author examined how they developed the advanced training courses. Then a framework to assist in the development of advanced training courses was created.

3.6 Limitations

There were a few limitations in the data collection. Some participants were not willing to answer some questions. There were also difficulties in collecting the data from training institutions in other countries. Although face-to-face interviews had afforded the researcher the chance to probe more into the issues under investigation, there was little chance to meet with the participants. All research instruments were sent via
Google forms or e-mail versions of the interview guide for filling and reverting. Although Google forms are compatible in the mobile browser, it significantly reduced the answers to questions because participants had difficulties in writing long answers.
4. **Research finding and analysis**

This chapter analyses data which were collected from three sectors: administrations, training institutes and seafarer supply companies. The researcher sent the questionnaires through the WMU alumni network and individually to the contacts which were collected during field studies. The researcher sent the questionnaire to more than 100 contacts. The responses were got from 28 persons from different countries. MET experts in Myanmar, Vietnam, the United Kingdom, Iraq, Iran, the Philippines, Germany, the Netherlands, Panama, Japan, Iraq, Ghana and Kenya, i.e. 13 countries, responded to this survey. There might be weaknesses in data analysis due to the low response rate. However, the researcher tried to fill up the weaknesses by reviewing the maritime experts’ literatures and papers.

4.1 **Research respondent demographics**

Questions in this section intended to know who was participating in Maritime Education and Training (MET), the background of participants and their experiences related to MET.

Of the 31 respondents, only 4 respondents are female. It further highlights that the shipping industry and MET sectors are male oriented industry. The female influence in MET sector is very weak. To achieve UN SDG 5 (Gender Equality), there are a lot of challenges in the shipping industry. National policies and social background mostly influence the participation of females in the shipping industry. For instance, in Myanmar, people believe that the shipping industry is a male oriented industry and it is very dangerous for women seafarer. In addition, national policy does not allow females to work on board ships. The government needs to create more job opportunities for women.
The average age of the respondents was between 31-45 years. It was a good figure for the shipping industry. The average seafaring experience of respondents is around 10 years (Appendix 4, 5 & 6). They have enough experience and can support the shipping industry for future development. However, they need continuous improvement of their skills because the shipping industry is rapidly changing in technologies and science. MET always has to keep in line with the changes in the industry.

4.2 Analysis of data from Maritime Administrations

The questions in this section intended to explore how maritime administrations legislate the requirements for advanced training courses and to know what advanced training courses are expected to be run by training institutes and shipping companies. The data received from maritime administrations is presented in appendix 4.

Sixty percent (60%) of the respondents from administrations approved the advanced training courses beyond the requirements of STCW. However, some training courses concerned shore based professionals. For example, Diploma, BSc, Master in Port and Shipping Administration, Financial Accounting, Audit, Principles and practice of management, Human Resource Management and Procurement are arguably more relevant for shore-based maritime professionals. However, some administrations approved specific type training of ECDIS, safety officer training, VTS training based on the standards of IALA\(^4\), Search and Rescue operations, IMDG Code\(^5\), III Code\(^6\), Ship Registration and PSC\(^7\) officials. This data is very confusing to the researcher. The researcher interviewed persons responsible for seafarer training during a visit to the Philippines. The persons in charge of the STCW section of Maritime Industry Authority (MARINA), Philippines, replied that they did not endorse any advanced

\(^4\) IALA: International Association of Marine Aids to Navigation and Lighthouse Authorities  
\(^5\) IMDG Code: International Maritime Dangerous Goods Code  
\(^6\) III Code: Implementation of IMO Instrument Code  
\(^7\) PSC: Port State Control
training courses beyond the requirements of STCW. MARINA accredited only mandatory courses required by STCW but they accepted that advanced training courses were conducted by METI. During another visit to Fleetwood Nautical Campus in the UK, the researcher also discussed that matter with persons responsible for seafarer training. They also conduct the advanced training courses requested by shipping companies. The UK maritime administration, the Maritime and Coastguard Agency (MCA) accepts these training courses but they do not endorse certificates of these courses. The researcher understands that Maritime Administrations accept the advanced training courses developed by METI as per requirements of shipping companies but they do not endorse the certificate of advanced training courses.

Related to the question "Are there any advanced training (non-STCW) courses that the Administration would like METI and shipping companies to run?”, 66.7% of the responses from administrations desired to develop other advanced training courses beyond the requirements of STCW. Their expected advanced training courses are Hazardous Materials (Hazmats), BSc, MA in Oil & Gas, advance courses in LNG, offshore courses, skills courses like forklift operations, crane operations, cherry picker courses, shipping insurance, law of the sea and shipping operations management. Most of their desired advanced training courses are related to shore-based tasks except Hazmats, advanced course in LNG and offshore course. The researcher views that most government activities are more focused on the training related to shore-based tasks. 70% of the respondents answered that they promulgated the subordinate legislations relating to develop advanced training (non-STCW) courses (Appendix 4). It is shown that most governments have the policies to develop advanced training courses (non-STCW) beyond STCW.

Maritime administrations organised a team for the development of advanced training (non-STCW) courses and the mandatory courses required as per STCW. 70 % of the responses from administrations organised the team to design the curricula, in which maritime administration, METI, Seafarer Employment Company (or) Shipping
Company, Seafarer Union and Experts or Experienced person participate (Appendix 4). In some countries, curricula for advanced training (non-STCW) courses are designed individually by METIs or shipping companies.

4.3 Analysis of the data from Maritime Education and Training Institutions (METI)

The data from the METI sector is crucially important for this research paper. METI is the major backbone of the shipping industry. The shipping industry cannot be sustained without competent seafarers. METI supply competent seafarers to the shipping industry. METI is the executive arm of national maritime training policies. This dissertation explores which advanced training courses are being developed by Maritime Education and Training Institutions under different jurisdictions and what factors are considered in the identification and development of the advanced training courses. The data received from METIs is presented in Appendix-5.

The Maritime Education and Training Institutes in England, Germany, the Netherlands, the Philippines, Panama, Japan, Iraq, Vietnam and Myanmar answered the questions in the questionnaire. The Organisation for Economic Co-operation and Development (OECD) countries, major seafaring countries and the largest ship registration countries participated in this survey. The data received from this section is beneficial for this research due to the answers are became from different backgrounds.

The respondents have initiated the following courses: applied maritime English, ship handling and manoeuvring work, anchor handling, maritime surveying, tugboat training, cultural awareness, tanker cargo operation, practice navigational watch for junior deck officers, practical engineering watch, bespoke safety training, oil record book training, hazmat, Safety Representative and Work Environment Committee
(SRWEC), operation and maintenance of 2-Stoke Engine, refrigeration and air conditioning systems and programmable logic controllers. It appears that although it can be argued that some of these courses still fall under the STCW, the respondents view their ways of delivering the courses and elements treated in them, as going beyond the requirements of the Convention. When analysed the different advanced training courses, the researcher found that METIs fostered advanced training programmes based on their national policies, social background and the ship companies’ requirements. They used advanced technologies as teaching aids in the development of advanced training programmes and more focused on the shipboard communication training.

The respondents also indicated that there are some advanced training courses requested by shipping companies. They are master-pilot relationship course, electric arc welding, crane handling operation, pneumatics and hydraulics for marine operations, fuel injection pump assembly and disassembly, cook upgrading course, heavy lift course, etc. It can be debated that even though some of the above training courses fall under the convention, shipowners still require more specific trainings for certain types of operation.

During the visit to the Philippines, the person responsible for United Marine Shipping explained how the shipping companies supply practical teaching aids, such as reefer containers to train their seafarers. Some advanced training courses are collaboratively developed by METI and the shipping companies. Shipping companies also need to invest in training to secure the safety and the protection of the environment.

Almost all METIs have the curriculum development procedure in their quality standard systems (QSS). The shipping companies’ requirements, finance, infrastructure, instructor's qualification, entry standards of the candidate, availability of instructors, teaching aids, national policies, international policies and number of students are considered in the development of advanced training courses. The
shipowners' expectations are dominantly influencing the development of advanced training courses. METI is a service organisation in the maritime industry but the customer of METI is complex to identify. The end user of METI is the shipping companies. Some METIs do not directly contact the end user. They lose the direct discussion with the end user and cannot get proper feedback for the quality of outcomes from the end user.

More than half of the respondents have a budget policy. Most METIs use the budget between 0-5% of the total budget for advanced training courses. METI is mainly considered non-profit, but, the institutions need to be financially sustainable, so METIs use the budget carefully.

4.4 Analysis of the data from Seafarer Supply Companies (Seafarer Recruitment Companies)

The data from the Seafarer Supply Company (Seafarer Recruitment Company) sector is very weak for this research paper. To get the data from a Seafarer Supply Company is very difficult. The data related to Seafarer Supply Companies was obtained only from Myanmar.

The researcher observed that seafarer recruitment procedures are different depending on national policies. For example, in the UK, shipping companies directly employ seafarers and arrange the scholarship programme for navigational officers or engineers to attend the training courses. In Myanmar, shipping companies contact or appoint the crewing agent (Seafarer Supply Company) to employ the seafarers. Seafarers do not directly contact shipping companies. The advanced training courses requested by shipping companies are arranged by Seafarers Supply Companies. On the other hand, shipping companies design the curriculum individually for their own company and the experienced master of that company deliver that course.
Myanmar’s seafarer supply companies developed a Safety Officer course, ECDIS in-house training course (type specific) and ISM Course. It is observed that all training courses are intended to facilitate shipboard operations. Some shipping companies requested to conduct refresher courses on SOLAS, ISM and ISPS for on leave crew and on-board practice job training. It is clear that advanced training courses beyond the requirements of STCW conducted by seafarer supply companies are to meet the shipowners’ expectation.

The advanced training courses required as per shipboard operation procedures are designed by the experienced master of that company. The advanced training course for the specific type of equipment is designed by the manufacturer. The experienced master of that company delivers the lectures to the seafarers. The main factors influencing the design of curriculum development are infrastructure, shipping companies' requirements and instructors' qualifications. Mostly, they do not have the budget policy for the advanced training courses. They use the budget independently for advanced training course development.

All companies have the policy to upgrade the knowledge and skills of instructors. The companies initiate the upgrading courses of new regulations, usage of teaching aids, computer skills and trainer courses conducted by classification society and manufacture.

The companies have the feedback procedure in their Quality Management System (QMS) from the shipping companies. The seafarer supply companies need to continuously monitor the performance of seafarers and to support the continuous professional development of seafarers. The feedback periods are different for each company. It depends on the procedures stated in QMS of the company. The companies usually adapt the curriculum of the advanced training courses depending on the requirements of shipowners and accidents that happened on board the ship. The
researcher views that the seafarer supply companies are profit organisations. They focus primarily on the satisfaction of shipping companies. They need to support the continuous professional development of seafarers jointly together with shipping companies.
5. Discussion of findings and applications in Myanmar

The data which was received from the questionnaire was analysed in Chapter (4). In this section, the research questions will be answered by using data analysis from the questionnaires which is also supported by literatures discussed in chapter 2 and MarTID Training Practices Report (2018).

5.1 What advance training courses beyond STCW are being offered by different jurisdictions?

Iraq, Ghana, Kenya, Honduras, the Philippines, Vietnam and Myanmar participated in the survey of this dissertation. These nations represented Asia, Africa and Central America. Of these countries, some countries are major seafarers supply countries. The result was obtained from different countries in different regions. Advance training courses offered by maritime administrations are varied as per response result.

The advanced training courses approved by the maritime administrations have been stated in Chapter (4). The most advanced training courses approved by their maritime administrations are different because the government’s policies are different in each country. Maritime administration is the executive arm of the government (Mukherjee & Brownrigg, 2013). So, the maritime administration has the responsibility to implement the government’s policies. The most advanced training courses approved by maritime administrations and their expectations are focusing more on the development of maritime professionals who are working in coastal areas, onshore and in higher education programmes. The development of advanced training courses is being dominantly influenced by local society background and government policies.

In the METI section, the participation of Vietnam, United Kingdom, Iraq, the Philippines, Germany, Panama, Japan and Myanmar is very valuable for this question.
OECD countries, major seafarer supply countries and the world’s largest ship registration countries participated in this survey. The answer can be more comprehensive due to the participation of different societies and professional backgrounds.

The advanced training courses offered by METI are applied maritime English courses for ratings, simulator instructors, professional (simulator) courses, master programmes, rating on job course, ship handling and simulator work, basic computer skill training, anchor handling training, maritime survey, tugboat training, cultural awareness, tanker cargo operation, bespoke safety training for shipping companies, oil record book training, HAZMAT, SRWEC (Safety Representative and Work Environment Committee), safe mooring operation, operation and maintenance of 2-stroke engines, refrigeration and air conditioning systems and programmable logic controllers. As discussed in chapter (4), although some of above training courses fall under the convention, METIs initiated more specific training courses for certain types of ships, equipment and operations which were offered by the shipping companies. They view that specific training courses are going beyond the requirements of the convention. The most advanced training courses are using modern training aids. METIs are focusing on using modern technologies as training aids. According to the requirements of STCW Code A, only Radar and ARPA\(^8\) training courses require mandatorily the simulator to demonstrate the competence (IMO, 2017). Although other training courses\(^9\) use the simulator to demonstrate the competence, they can choose other demonstrative methods instead of the simulators. However, simulators for on board operations of certain types of ships and on board equipment are widely being used in the METI. According to MarTID 2018 training practice report, over 86% of the companies use the simulator to train bridge officers and around 60% total use simulators to train engineering officers.

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\(^8\) ARPA: Automatic Rada Piloting Aid

\(^9\) such as BRM and ERM
The data received from the Seafarer Supply Company is weak. However, this paper observed that they created the advanced training courses required as per shipping company policies. Some shipping companies design the curriculum. The experienced masters of these companies deliver the training courses.

According to the result of this dissertation, many Maritime Administrations intend to create advanced training programmes related to higher maritime education and maritime professionals working in the coastal waters and on shore. Their training courses are focusing on the sustainable development of local economy and society. The METI creates the advanced training courses based on the requirements of the government policies as well as the continuous professional development of seafarers and the shipping industry needs. They utilise modern technologies\(^\text{10}\) in teaching aids to practice the tasks performed on the ship.

### 5.2 What factors are considered in the identification and development of such advanced training courses?

According to a MarTID (2018) report, the most important driver of training, or reason for training, is to reduce accidents (i.e. ensuring safety). The second most important training driver for MET is to comply with external regulations. The weighted score of each training driver is shown in Figure 5.1. This dissertation also intends to reduce the number of accidents and to facilitate the shipboard operation.

---

\(^{10}\) such as simulators
The responsibilities of Maritime Administrations are to legislate into the national laws from international maritime regulations and to execute the government legislation and policies. Most governments create their policies based on the sustainable development of local society, local economy and the environment. The government policies solely influence the development of advanced training courses approved by the Maritime Administration.

Most Maritime Administration approved the advanced training courses conducted by the METIs. However, most of these training courses are related only to the activities in coastal waters and onshore and to higher education training programmes. The maritime administration does not usually disseminate subordinate legislation for advanced training courses requested by shipping companies. This was observed in the answers of the questionnaires and interviews with persons responsible for maritime administration. During the Philippines field study, the researcher also interviewed the representatives of the STCW section of MARINA. MARINA does not accredit the advanced training courses beyond the requirements of STCW. MARINA only accredit

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11 See in Appendix 4.
the mandatory training courses under the Convention as referred to in STCW Circular No. 2018-02 (MARINA, 2018).

The 70% of total response administrations generate a team to design the curriculum. In some maritime countries, only METIs design the curriculum for training courses (see Appendix. 4). Maritime administration and METI play the central roles in the curriculum development process. In some countries, other stakeholders, such as shipping companies, ship owners, seafarer union and experts, are also participated in this team. Figure 7 illustrates that the participated score of stakeholders in the curriculum design team.

![Figure 7. The participated score of stakeholders in the curriculum development team](image)

Most METIs (92.9% of total responses)\(^\text{12}\) have the procedure to design the curriculum of advanced training courses in their Quality Management System. One METI responded that they deliver the cadet training course which is provided by the shipping company for their cadetship program. As another observation, the researcher visited Simwave – Maritime Centres of Excellence in Rotterdam, the Netherlands. During the trip to Simwave, the researcher discussed the training programmes conducted by the training centre. That training centre has 53 simulators for training facilities (Simwave, 12 See Appendix 5)
n.d). Simwave offers their training facilities to shipping companies. They directly contact the shipping companies and clients and support tailor-made training programmes for the shipping companies. It is realised that METIs seriously consider the requirements of the shipping companies to design the training program. The METIs under the auspices of the government implement advanced training courses, such as higher education, as per requirements of the national policies.

METIs play a critical role in the design and development of the training programme. The researcher interviewed and MET expert - Professor Stephen Cross. During the interview, he noted about the Maritime Institute Willem Barentsz (Netherland’s premier METI) that “there are various heads of teaching who will adapt curricula. This is not considered research, but development. Information and new requirements coming from industry/government/colleagues will provide materials needed to adapt curricula to”.

METIs analyse the information that comes from shipping industry/ accidents investigation branches/ government/ colleagues and adapt the curriculum based on that information. METIs also need to analyse the internal factors of training institutes to successfully achieve the learning outcomes of training institutes and the government policies. They analyse the qualification of the instructor, availability of instructors, staff, training facilities, finance, infrastructure and technology skills of instructors to achieve the learning outcomes. The METIs are utilising the simulators as teaching aids to deliver the advanced training courses. As per STCW Reg. I/6, the instructor should be appropriately qualified for the appropriate training courses. Even if the advanced training courses are not mandatorily required by STCW, the curriculum development procedures included in QMS should be followed. For instance, the instructor who teaches the simulator training should complete successfully "Training Course for Instructor" based on IMO Model Course 6.09 as well as “Train the simulator trainer and assessor” course based on IMO Model Course 6.10. The instructor should also have the competency for that level. The challenge faced with the rapid growth of
technology is the lack of technical skills of the instructor. The METIs create the upgrading courses, computer skills training, familiarisation training to teaching aids, coordinating joint training among training sections and other sections, simulators, faculty development programs and teaching method. The METIs have the continuous professional development programme for instructors. However, intervals of upgrading training programmes are varied depending on the policies of METIs.

The qualification of supporting staff is also important in the delivery of training courses. The qualification of the supporting staffs should be upgraded to always keep abreast with the changing of training courses. The METIs should prepare the proper strategic plan for the sustainable development of the skills of supporting staff.

The METIs create the strategic plan and set up the vision, mission and objectives, define key performance indicators timelines and responsible persons and develop finance and human resource. Finance plays a critical role in the sustainable development of METI. The METI needs to properly control the finance for sustainable development. More than half of the responses have the budget policy for the advanced training courses. Most of them use the budget between 0-5% of the total budget. Some of them are highly invested in the advanced training programmes. They directly contact shipping companies and create tailor-made programmes for shipping companies. Shipping companies are their major clients and the end users. The customers of MET are shipping companies, seafarers and society.

The METIs have the feedback procedure in their QMS from different customers. They get the feedback from the shipping companies or ship owners. Some METIs take the feedback from the students and seafarers supply companies for improvement of training courses. They use document forms mostly. They also use other communications such as social media, email, for the feedback on the training courses. Some METIs usually carry out formal meetings with shipping companies or ship owners. They get direct feedback annually from the end user. The customer focuses of
METIs are varied depending on their policies. METIs create advanced training programmes based on the policies of their strategic plan.

Most METIs revise the training programmes annually based on the requirements of the shipping companies or ship owners, new regulations, national policies, the feedback from the students and seafarer supply companies, financial condition and innovative training aids, etc.

In summary, the following factors should be considered in the identification and the development of advanced training courses. The Maritime Administration has the responsibility to disseminate subordinate legislations related to training courses based on the requirements of international regulations and the government policies. Usually, maritime administration does not propagate subsidiary legislations for the advanced training courses required by shipping companies. The METIs implement the advanced training courses which are required by the maritime administration and shipping companies. When they design training courses, they consider seriously the qualification of human resources, resources availability and financial condition for the sustainable development. They usually adapt the curricula based on the requirements of national policies, shipping industry, resource availability, innovative training aids and the information from the feedback system. Every METI has developed a Quality Management System (QMS) for the development of training courses and the sustainable development of training institutes.

5.3 What framework can be developed for the decision making about identification curriculum development and evaluation of such courses?

The researcher developed a framework for the decision making about the identification of curriculum development and evaluation of the advanced training courses. It is
observed that advanced training courses are required to facilitate shipboard operations, to secure the safety, security and protection of the environment and for local social needs. There are three major drivers to develop advanced training courses. They are international regulations, national policies and the shipping company’s requirements.

A seafaring professional is a specialised professional, who has to meet the requirements of both the shipping companies and the international maritime regulations (Shicheng, 2009). The maritime administration executes the primary legislation and disseminate the secondary legislations to all stakeholders (Mukherjee & Brownrigg, 2013).

Shipping companies expect to develop advanced training courses beyond the requirements of STCW due to the rapid growth of technologies and the current issues occurring in the shipping industry (MarTID, 2018, p. 44). The MET is the proactive sector in the shipping industry to reduce accidents and incidents that happen at sea. The METIs observe the current issues in the shipping industry and discuss with shipping companies to develop advanced training courses. Some shipping companies create the training programme to deliver the training courses. The METIs deliver advanced training courses supported by shipping companies. Before developing the training programmes, the METIs analyse the internal factors such as qualification of human resources, human resource availability, training facilities, infrastructure, finance condition and time available.

As discussed in chapter 2 and 4, the METIs developed the advanced training courses by following procedures stated in QMS. The METI set the goals, the learning outcomes, determine the qualification of instructors, qualification of supporting stuff, standard level of students, timetable, course content and assessment, develop training facilities and infrastructure.

The METIs have the feedback procedure in QMS to get the feedback from students, society and the shipping industry. They evaluate the feedback and adapt the curriculum
to achieve more learning outcomes. The curriculum development procedure is also flexible to adapt the curriculum depending on the requirements of shipping companies, national legislation, innovative training aids and resources availability. The METIs prepare the proper strategic plan for the sustainable development of training institutes. After analysis of the data from the questionnaire, the researcher created a framework of a developing process of advanced training courses beyond the requirements of STCW.
Figure 8. Flowchart to develop advanced training courses
5.4 Applications in Myanmar

In Myanmar, the Department of Marine Administration is the executive arm of the government. DMA implements the national legislation and national policy. The government sets the policy for the higher education of maritime professionals. It intended to attract young people to become seafarers. In 2004, the government inaugurated Myanmar Maritime University (MMU) and opened bachelor degree courses for maritime professionals. In 2009, the Institute of Maritime Technology (IMT) upgraded to Myanmar Mercantile Marine College (MMMC) and issued diploma certificate. MMC is under the auspices of the Ministry of Transport and Communication and MMU is under the auspices of the Ministry of Transport and Communication and the Ministry of Education. DMA approved that advanced training programmes as per requirement of the government policies and society needs. DMA has not approved other advanced training courses conducted by METIs but DMA accepts these training courses.

In 2010, the government allowed the opening of private maritime training institutes for the running of mandatory courses including navigation officers and engineers training required as per STCW. The private METIs are self-funding. Finance is crucially important for the sustainable development of training institutions in Myanmar.

It is observed that the METIs are using simulators and model equipment as training aids to develop advanced training courses. In Myanmar, there are 6 numbers of Full Mission Bridge and 4 Engine Room Simulator in the whole country (DMA, 2018). There is no machinery model for specific types. In Myanmar, the training facilities are not efficient to develop advanced training courses. However, it is observed that METIs can collaborate with shipping companies to develop the advanced training programmes. During the field study to the United Marine in the Philippines, the person responsible explained that shipping companies and shipowners supply the type-
specific machinery model and refer the model to deliver the training courses for their crew. It was also observed during the field study to Norway, the University of South-Eastern Norway (USN) collaborate with Petroleum Geo-Services (PGS) for the simulator training of their modern seismic vessel (Ramform Titan Class). Kongsberg innovated the Ramform Titan-class ship model for the simulator training. It is the latest model of marine simulators of Kongsberg. It is seen that the university collaborates with the companies and training facility innovator for the development of advanced training courses.

The METIs establish the communicational channel with the shipowners and shipping companies to develop advanced training programmes. They directly contact and conduct the meeting with the shipowners and shipping companies to develop advanced training courses. In Myanmar, the communication channel between the METIs and the shipping companies and shipowners is weak. The METIs get the feedback from shipping companies via alumni and seafarer supply companies.

As a result, the Government policy is crucially important in the development of advanced training courses. If the government invested more in METIs, the training facilities of METIs would be improved and could attract the customers. The challenge of METIs is the lack of training facilities to develop the advanced training courses. The METIs should collaborate with shipping companies to develop the advanced training programmes. The METIs in Myanmar are weak in direct contact with the end users (shipowners/ the shipping companies). The METIs should create a link with the shipowners and shipping companies to develop advanced training courses. The private METIs in Myanmar are self funded. The finance is important for the sustainable development of the training institute. The METIs should prepare the proper strategic plan for the sustainable development of the institution.
6. Conclusion

In the global shipping industry, the human factor is the lifeblood of the industry. Most of the maritime accidents happen because of human error. In recent years, the rapid growth of technologies, multicultural organisation and minimum safe manning on board ship were caused by human errors. Shipowners/ shipping companies are requiring qualified professional seafarers on board their ship, which is beyond the competency of the seafarers. Due to the current demand of the shipping industry, the METIs under different jurisdictions are developing advanced training courses to keep abreast with the changes in the shipping industry. This dissertation identified which advanced training courses are being developed by different jurisdictions, what factors are considered in the identification and the development of advanced training courses and what a framework can be developed for the decision-making about identification curriculum development and evaluation of such courses. This dissertation created a framework to be applied in the development of advanced training courses in Myanmar. However, this framework is not only for Myanmar. It can also be used in other seafarers supply countries.

IMO, a regulatory body, adopted maritime conventions universally to ensure the safety, security and environmental performance of international shipping (IMO, 2018a). IMO also adopted the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) in 1978 but it is not optimally addressing the on-the-job competence requirements of industry. In 1995, STCW 1978 was revised and major amended by adding many specific competence standards in a new Seafarers Training, Certification and Watchkeeping Code (STCW) Code. The 2010 Manila amendments to the Code retain in this paradigm, but the new technologies such as simulators, ECDIS and Full Mission Simulators, are used as training aids to demonstrate the competence. STCW is amended based on the changes of the industry.

IMO also adopted another international measure, the ISM Code, to assist the human
element in the shipping industry to facilitate shipboard operations and to secure safety, security and environmental protection. The regulator sector of the shipping industry is reactive and MET is the proactive sector which prevents the accidents or incidents not to happen in the shipping industry. On the other hand, the shipping industry is a progressive industry in the world. The technologies in the shipping industry are rapidly changing. The MET has always kept abreast with the changes in the industry. The advanced training courses offered by different jurisdictions are varied based on the requirements of policies, society needs and the improvement of technologies.

The two major drivers of the development of advanced training courses are maritime administrations and the shipping companies or shipowners. The advanced training courses offered by MA are based on the requirements of national legislation and policies and society needs. The advanced training courses offered by shipping companies are based on the requirements of technological improvements, the specific types of equipment, specific types of ships and organisational communication. MA circulates the legislation and the procedures for advanced training courses they offer. MA does not accredit advanced training courses offered by shipping companies. Shipping companies offer METIs to deliver courses for their seafarers. The METIs design the training courses by analysing internal resources of institutes and external factors. The METIs use the simulators as training aids to improve their learning outcomes. Some shipping companies supply simulators or the models for specific types of machinery to train their crews.

METIs have developed a Quality Management System (QMS) for the sustainable development of organisations and training courses. Sustainable development of METIs does not mean profitability but signifies a strategic plan. The QMS of METI needs to include an understanding of, and alignment with, the strategic direction of the company (Hammer, 2017). The METIs have created proper strategic plans to achieve their objectives. The training programmes of METIs should be improved continuously. The METIs have the feedback procedure to evaluate the effectiveness of training
courses. The METIs collect the feedback from the end users – the shipping companies or shipowners. The METIs usually meet with the shipping companies/shipowners for the continual improvement of training courses. The METIs evaluate the feedback from the shipping companies/shipowners and adapt the curriculum for continual improvement. This dissertation has created a framework for the development and evaluation of advanced training courses beyond the requirements of STCW.

This framework can be applied for the curriculum development and evaluation of advanced training courses in Myanmar. It can also be applied in other maritime nations. DMA, an executive organisation of the government, accept the advanced training courses required by the shipping companies but it cannot be accredited. In Myanmar, METIs are separated into the public sector and private sector. METIs related to the higher education of maritime professionals are under the auspices of the government. METIs which are under the private sector are allowed only to develop the mandatory courses required by STCW. Some METIs opened some advanced training courses requested by seafarers supply companies. The private maritime training centres in Myanmar do not get the budget support from the government but they are self-funded. The finance condition is a challenge for the private training institution. The METIs in Myanmar lack using advanced training aids, such as simulators and real models, for specific types of ships, equipment and machinery. METIs have no direct communication link between METIs and shipping companies. They get the feedback from shipping companies via seafarers supply companies.

Therefore, it is recommended that the government should set up the policies which encourage the development of seafarer training programmes. The METIs should design the strategic plan properly with the clear vision, missions, goals, objectives, actions and KPI. The training facilities should always be kept abreast with the changes in the industry. The METI is the service organisation in the shipping industry. They should keep the communication with the end user, the shipping companies and shipowners to get the feedback for their products (quality of seafarers).
References


IMO. (2017a). International Convention on Standards of Training, Certification and


Shicheng, Y. (2009). Challenges and Opportunities for Maritime Education and Training: China’s Perspective


Appendices

Appendix 1. Research ethics: Consent Form

RESEARCH ETHICS: CONSENT FORM

Project Title: “An analysis of maritime training beyond the requirements of STCW and applications in Myanmar”

Researcher:
Thu Rain Win
Student, MSc Maritime Affairs
World Maritime University
211 57 Malmö, Sweden
E-mail: w1701350@wmu.se

Please Tick Box

1. I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions.

2. I consent to my personal data, as outlined in the accompanying information sheet, being used for this study and other research. I understand that all personal data relating to volunteers is held and processed in the strictest confidence and that should a need arise for the inclusion of any personal details in the research, express consent for such inclusion will be obtained from me in advance.

60
3. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason. ☐

4. I agree to take part in the above study. ☐

*Tick the statements if appropriate*

5. I agree to the interview / consultation being audio recorded ☐

6. I agree to the interview / consultation being video recorded. ☐

7. All data collected will be deleted upon completion of the research as stated in the research guidelines ☐

Name of participant: __________________________ Signature: __________________________

Date: __________________________
Appendix 2: WMU Research Ethics Committee Protocol

<table>
<thead>
<tr>
<th>Name of principal researcher:</th>
<th>Thu Rain Win</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name(s) of any co-researcher(s):</td>
<td>No</td>
</tr>
<tr>
<td>Name of supervisor, if any:</td>
<td>Professor Michael Ekow Manuel</td>
</tr>
<tr>
<td>Title of project:</td>
<td>Assessment of Advanced Training Courses beyond STCW</td>
</tr>
<tr>
<td>Is the research funded externally?</td>
<td>No</td>
</tr>
<tr>
<td>If so, by which agency?</td>
<td>No</td>
</tr>
<tr>
<td>Where will the research be carried out?</td>
<td>During the field study trips, will collect the personal contact. The research will be carried in major seafarer supply countries, developed countries and other seafarer supply countries.</td>
</tr>
<tr>
<td>How will the participants be recruited?</td>
<td>The participants will persons who are working in administrations, institutions and seafarer employment companies. The participants will be recruited by phone, e-mail and social media such as facebook, twitter and linkedin.</td>
</tr>
<tr>
<td>How many participants will take part?</td>
<td>Between 10 and 20 participants.</td>
</tr>
<tr>
<td>Will they be paid?</td>
<td>No</td>
</tr>
<tr>
<td>If so, please supply details:</td>
<td>No</td>
</tr>
</tbody>
</table>
| How will the research data be collected (by interview, by questionnaires, etc.)? | 1) 1st Stage: Conduct interviews of persons who are working in administrations, institutions and seafarer supply countries in major seafarer supply counties and developed countries.  
2) 2nd Stage: Collect data from seafarer supply countries by questionnaires. |
| How will the research data be stored? | Research data will be stored in my personal laptop and hard disc with strong password. |
| How will the research data be disposed of? | Data will be deleted on 30 Nov 2018. |
| Is a risk assessment necessary? | No |
| If so, please attach | |

Signature(s) of Researcher(s): [Signature]  
Date: [Date]

Signature of Supervisor: [Signature]  
Date: [Date]

Please attach:  
☐ A copy of the research proposal  
☐ A copy of any risk assessment: [Not Applicable]  
☐ A copy of the consent form to be given to participants  
☐ A copy of the information sheet to be given to participants  
☐ A copy of any item used to recruit participants: [Not Applicable]
Appendix 3: Information Sheet

Information Sheet

This interview will be conducted in connection with a Dissertation which will be written by the interviewer, in partial fulfilment of the requirements for the degree of Master of Science in Maritime at the World Maritime University in Malmo Sweden. The chosen topic of the Dissertation is “An analysis of advance training beyond the requirements of STCW and applications in Myanmar”.

The interview will be short and straightforward; however it will allow you the opportunity to express yourself on the subject matter without restriction. You may withdraw from the interview at any point.

Please note that all data will be held in strictest confidence, stored securely and at the end of the research all the data collected will be disposed of. Strict confidentiality will be observed and your data will not be shared with anyone else.

Your participation in the interview is highly appreciated.

Regards

Thu Rain Win  
M.Sc student, Maritime Education and Training  
Email: w1701350@wmu.se  
Telephone: +46 73 483 86 80
Appendix 4: Presentation of data (Administration)

**Administration**

The following questionnaires were prepared based on my research questions of dissertation.

**Personal Information**

What is your gender?

![Gender bar chart]

- Male: 7 (70%)
- Female: 3 (30%)

What is your age?

![Age bar chart]

- <20 years: 0 (0%)
- 20-30 years: 3 (30%)
- 31-45 years: 4 (40%)
- 46-65 years: 3 (30%)
- 65+ years: 0 (0%)

What is the name of your national administration?
How many years of experience do you have in the Maritime Education and Training (MET) field?

10 responses

- 10 years
- 16 years
- 11
- 11 years
- 4 years
- 1
- None
- 2
- 8 months
- 8

How long have you worked in the administration?
9 responses

10 years
31
19 years
8 years
4
14 years
5
3 years
6

What is your current position in the administration?
9 responses

Director
head of department
Principal Officer
Human Resource Officer
Head of the Maritime Training Center of Honduras
Division Manager / Terminal Manager
Employee
Port Captain/ Training Officer
Maritime Industry Development Specialist

Administration
1. Are there any advanced training (non-STCW training) courses being offered by Maritime Education and Training Institutes (METI) and shipping companies that are approved by the national administration? 

10 responses 

[Pie chart showing 40% Yes and 60% No]

2. If Yes, please indicate what these courses are…..

6 responses

- ECDIS (Specific)
  - dredging, hydrographic survey course
- Diploma, BSc, MA in Ports & Shipping Administration
- Financial Accounting, Audit, Principles and practice of management, Human resource management and Procurement
- Many such as VTS trainee based on the standard of IALA, Search, IMDG code, Triple I code, Ship Registration, PSC officials

3. Are there any advanced training (non-STCW) courses that the Administration
would like METI and shipping companies to run?

4. If Yes, please indicate that what these courses are …

5. Are there any legal instruments promulgated by your national administration to develop advanced training (non-STCW) courses?

6. Are curriculum development groups/teams organized to design curricula for
such training (non-STCW) courses?

7. Are curriculum development groups/teams organised to design curricula for STCW training courses?

8. If Yes, who participates in this group/team? (Choose all which apply)
9. If No, who designs the curriculum for training course? (Choose all which apply)

2 responses

Thank You
Appendix 5: Presentation of data (Training Institute)

Training Institute

The following questionnaires were prepared based on my research questions of dissertation. Total 15 responds were received from

Personal Information

What is your gender?

![Gender distribution chart]

What is your age?

![Age distribution chart]
What is the name of your Maritime Education and Training Institute (METI)?

<table>
<thead>
<tr>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Myanmar Excellent Stars Maritime training centre</td>
</tr>
<tr>
<td>WMU, MIWB</td>
</tr>
<tr>
<td>MYANMAR MERCANTILE MARINE COLLEGE</td>
</tr>
<tr>
<td>Ho Chi Minh City University of Transport</td>
</tr>
<tr>
<td>Myanmar Excellent Stars</td>
</tr>
<tr>
<td>WISE WISH Marine Engineering Training Centre</td>
</tr>
<tr>
<td>Fleetwood Nautical Campus</td>
</tr>
<tr>
<td>Arab Academy for Science and Technology and Maritime Transport (AASTMT)</td>
</tr>
<tr>
<td>Philippine Merchant Marine Academy</td>
</tr>
<tr>
<td>HSB - City University of Applied Sciences, Bremen</td>
</tr>
<tr>
<td>International Maritime University of Panama</td>
</tr>
<tr>
<td>Japan Agency of Maritime Education and Training for Seafarer</td>
</tr>
<tr>
<td>Brilliance Maritime Training Centre</td>
</tr>
<tr>
<td>United Marine Training Center</td>
</tr>
<tr>
<td>Shanghai Maritime University</td>
</tr>
</tbody>
</table>

How many years of experience do you have in the Maritime Education and Training (MET) field?

<table>
<thead>
<tr>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 Years</td>
</tr>
<tr>
<td>38</td>
</tr>
<tr>
<td>Two years</td>
</tr>
<tr>
<td>20</td>
</tr>
<tr>
<td>10 years</td>
</tr>
<tr>
<td>5 years</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>8 Years</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>24 years</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>18</td>
</tr>
<tr>
<td>5 Years</td>
</tr>
<tr>
<td>12 years</td>
</tr>
<tr>
<td>10 years</td>
</tr>
</tbody>
</table>
How long have you worked in the training institute?
15 Responses

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 5 Years</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>One year and seven months</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>7 years</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>5 years</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>8 Years</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>24 years</td>
<td>1</td>
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</tr>
<tr>
<td>5 Years</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>10 years</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

What is your position in the training institution?
15 Responses

<table>
<thead>
<tr>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vice Principal</td>
</tr>
<tr>
<td>lecturer, instuctor, director, project manager, professor</td>
</tr>
<tr>
<td>Lecturer, Head of Department (Nautical Studies) /Attached</td>
</tr>
<tr>
<td>Lecturer, General Director of Maritime Education Center</td>
</tr>
<tr>
<td>Principal</td>
</tr>
<tr>
<td>Instructor &amp; Quality Manager</td>
</tr>
<tr>
<td>Curriculum Manager</td>
</tr>
<tr>
<td>Lecturer - Head of Quality Unit - Sea Training Institute (STI)</td>
</tr>
<tr>
<td>Assistant Professor</td>
</tr>
<tr>
<td>Director of Studies</td>
</tr>
<tr>
<td>R&amp;D Director</td>
</tr>
<tr>
<td>Chief officer</td>
</tr>
<tr>
<td>Lecturer</td>
</tr>
<tr>
<td>Managing Director</td>
</tr>
<tr>
<td>International Cooperation Coordinator</td>
</tr>
</tbody>
</table>
Training Institutes

1. Are there advanced training (non-STCW) courses conducted by your training institute?

2. If Yes, please indicate what these courses are...

<table>
<thead>
<tr>
<th>Applied Maritime English course.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simulator instructor, professional (simulator) courses, master programmes</td>
</tr>
<tr>
<td>i. Rating on job course</td>
</tr>
<tr>
<td>ii. Ship handling and Simulator work</td>
</tr>
<tr>
<td>iii. Basic computer skill training (computer department)</td>
</tr>
<tr>
<td>Simulation shiphandling, Anchor Handling training, Maritime Survey, Tugboat training, Cultural Awareness, Tanker cargo operation</td>
</tr>
<tr>
<td>Particular Skill training (On Job Training, English, Bridge watch keeping training by using bridge simulator)</td>
</tr>
<tr>
<td>Bespoke safety training for shipping companies</td>
</tr>
<tr>
<td>Several related to Bachelor in Engineering plan</td>
</tr>
<tr>
<td>Oil record Book Training, HAZMAT, SRWEC (safety Representative and work environment committee) for Norwegian Ships</td>
</tr>
</tbody>
</table>

I don't think the space will be enough as we have more than a hundred non-STCW courses. Just to name a few, Senior Deck Officer Refresher and Evaluation Program, Ship Handling and Maneuvering, Safe Mooring Operations, Operation and maintenance of 2-Stroke Engines, Refrigeration and Air Conditioning Systems, Programmable Logic Controllers
3. Are there any advanced training (non-STCW) courses requested by shipping companies/ship’s owners?

15 responses

- Yes: 86.7%
- No: 13.3%

4. If Yes, please indicate what these courses are…?

10 responses

- Applied Maritime English course.
- DP operator, BRM/ERM, dredging/oilspill training
- i. Rating on job training course
   ii. Ship handling and Simulator work
   iii. Basic computer skill training (computer department)
- Advanced ship handling, Advanced Cargo operation, Officer Assessment
- English speaking
- Automation & control engineering course
- Unfortunately, do not have full information
- Advance Training curriculum is provided by the shipping company to be used by selected instructors to deliver it to their selected cadets in their cadetship program.
- Oil record Book Training, Safety Representative for Norwegian Ships, HAZMAT
- Master Pilot Relationship Course, Electric Arc Welding, Crane handling Operation, Pneumatics and Hydraulics for Marine Operations, Fuel Injection Pump Assembly and Disassembly, Cook Upgrading Course, Heavy Lift Course, etc
5. Do you have the procedure in your Quality Standard System to design the curriculum?

6. If No, how do you develop new curriculum?

Advance Training curriculum is Provided by the shipping company to be used by selected instructors to deliver it to their selected cadets in their cadetship program.

7. What factors are considered in the design of curriculum for advanced training course? (Choose all which apply)

- Finance: 12 (80%)
- Infrastructure: 12 (80%)
- Shipping companies’ requirements: 15 (100%)
- Instructor's qualification: 10 (66.7%)
- Other: 8 (53.3%)
8. Do you have a budget policy related with advanced training (non-STCW) courses?

9. What percentage of budget is used for advanced training (non-STCW) courses?

10. Have training courses been developed to upgrade the technical skills, teaching skills and knowledge of instructors/assessors?
11. If Yes, what training courses are conducted? (*Choose all which apply*)

- Computer Skill: 6 (46.2%)
- Upgrading course for new regulations: 10 (76.9%)
- Usage of teaching aids: 10 (76.9%)
- Other: 6 (46.2%)

If other, please specify....
6 responses

- Co-ordination joint training among teaching and training sections and other staffs.

- Simulators
  - Assessor Course based on IMO Model Course 3.12
  - Maritime Instructor Course based on IMO Model Course 6.09

- The College had a variety of provisions for instructors from educational to industry-related, but the industry-related are managed through continuous professional development arrangements

- Research
  - Faculty Development Program, Teaching Methods, etc...

12. How often do you conduct training courses for instructor?

13 responses

- Monthly: 2 (15.4%)
- 3-monthly: 3 (23.1%)
- Semi-annually: 4 (30.8%)
- Annually: 1 (7.7%)
- Never: 0 (0%)
- Other: 3 (23.1%)
13. Do you have the feedback procedure in Quality Standards System from shipping companies/ ships’ owners related to performance of seafarers attended in your institution?

14. If Yes, how do collect the feedback from shipping companies/ ship’s owners?

<table>
<thead>
<tr>
<th>Method</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>by mail</td>
<td>3</td>
<td>23.1%</td>
</tr>
<tr>
<td>by document form</td>
<td>10</td>
<td>76.9%</td>
</tr>
<tr>
<td>other</td>
<td>5</td>
<td>38.5%</td>
</tr>
</tbody>
</table>

- Industrial Reference Group meetings
- Meeting, discussion
- One to one meetings and forums with employers
- Right now only by means of informal communication
- Meeting with shipping companies
- Phone interview to Seafarers Recruitment Agencies located in Myanmar
- Thru phone calls and skype as well
15. How often do you collect the feedback from shipping companies/ ship’s owners related to performance of seafarers attended in your institution?

16. How often do you change the curriculum?
17. When changing the curriculum, what factors are considered? (*Choose all which apply*)

- Shipping companies'/Ship owners' requirements: 12 (80%)
- Accidents/ Incidents occurred on-board: 7 (46.7%)
- Other: 11 (73.3%)

Thank You
Appendix 6: Presentation of data (Seafarer Supply Company)

Seafarer Supply Company

The following questionnaires are prepared based on my research questions of dissertation.

**Personal Information**

What is your gender?

![Gender Distribution](image1)

What is your age?

![Age Distribution](image2)
What is the name of your seafarer employment company?

<table>
<thead>
<tr>
<th>Company Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ocean Tanker Pte,Ltd. Singapore</td>
</tr>
<tr>
<td>Raffles Technical Services Pte, Ltd.</td>
</tr>
<tr>
<td>Pacific Manning Agency</td>
</tr>
</tbody>
</table>

How many years of experience do you have in the Maritime Education and Training (MET) field?

<table>
<thead>
<tr>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Years</td>
</tr>
<tr>
<td>8 months</td>
</tr>
<tr>
<td>20 Years</td>
</tr>
</tbody>
</table>

How long have you worked in the company?

<table>
<thead>
<tr>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Years</td>
</tr>
<tr>
<td>3 years</td>
</tr>
<tr>
<td>5 years</td>
</tr>
</tbody>
</table>

What is your position in the company?

<table>
<thead>
<tr>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior Officer</td>
</tr>
<tr>
<td>Port Captain/Training Officer</td>
</tr>
<tr>
<td>Manning Manager</td>
</tr>
</tbody>
</table>
1. Are there advanced training (non-STCW) courses conducted by your company?

2. If Yes, please indicate what these courses are.

   - Ship Security Officer, Safety Officer, ECDIS in House Training Course, ISM Course
   - Type Specific ECDIS Training for JRC ECDIS. Safety officer course.
   - In house training (Company Specific) & PLC course

3. Are there any advanced training (non-STCW) courses requested by shipping companies/ship’s owners?
4. If Yes, please indicate what these courses are…

3 responses

- Advance Oil Tanker Training, Advance Chemical Tanker Training
- On leave crew education courses (refreshing regarding SOLAS, ISM, ISPS), On job training courses for junior officer/engineer.
- In house training (Company Specific) & PLC course

5. Do you have the procedure in your Quality Standard System to design the curriculum?

3 responses

- Yes: 66.7%
- No: 33.3%

6. If No, how do you develop new curriculum?

1 response

Developed by experience masters who have train for trainer certificate. For ECDIS, we are using the course outline which was developed by JRC.
7. What factors are considered in the design of curriculum for advanced training course? (*Choose all which apply*)

- Finance
- Infrastructure
- Shipping companies' requirements
- Instructor's qualification
- Other

8. Do you have a budget policy related with advanced training (non-STCW) courses?

- Yes: 66.7%
- No: 33.3%

9. What percentage of budget is used for advanced training (non-STCW) courses?

- 0-5%: 0 (0%)
- 5-10%: 1 (33.3%)
- 10-15%: 1 (33.3%)
- 15-20%: 1 (33.3%)
- More than 20%: 0 (0%)
10. Have training courses been developed to upgrade the technical skills, teaching skills and knowledge of instructors/assessors?

11. If Yes, what training courses are conducted? *(Choose all which apply)*

If other, please specify....

*Executive Professional Development Courses*
*Trainer course conducted by class and manufacture.*
12. How often do you conduct training course for instructor?

- Monthly: 0 (0%)
- 3-monthly: 0 (0%)
- Semi-annually: 0 (0%)
- Annually: 2 (66.7%)
- Never: 0 (0%)
- Other: 1 (33.3%)

13. Do you have the feedback procedure in Quality Standards System from shipping companies/ ships’ owners related to performance of seafarers employed by your company?

- Yes: 100% (3 responses)
- No: 0%

14. If Yes, how do you collect the feedback from shipping companies/ ships’ owners?

- By mail: 1 (33.3%)
- By document form: 2 (66.7%)
- Other: 0 (0%)
15. How often do you collect the feedback from shipping companies/ ships’ owners related to performance of seafarers employed by your company?

16. How often do you change the curriculum?

17. When changing the curriculum, what factors are considered? (Choose all which apply)

Thank You