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WORLD MARITIME UNIVERSITY

Malmö, Sweden

**THE DEVELOPMENT AND MAINTENANCE
OF MARITIME EDUCATION AND TRAINING
(MET) IN LIBERIA:
A Historical Analysis**

By

MIATTA SONIE SHERIF
Liberia

A dissertation submitted to the World Maritime University in partial
fulfilment of the requirement for the award of the degree of

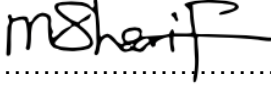
MASTER OF SCIENCE
In
MARITIME AFFAIRS
(MARITIME EDUCATION AND TRAINING)

2019

DECLARATION

1. I certify that all the material in this dissertation that is not my 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: 24 September 2019

Supervised by: Associate Professor Dr. Momoko Kitada

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ABSTRACT

Title of Dissertation: **The Development and maintenance of Maritime Education and Training (MET) in Liberia: A Historical Analysis**

Degree: **Master of Science**

Institutions in Liberia began offering Maritime Education and Training (MET) programs in the late 1970s. In 2016, the Government of Liberia and the Liberia International Shipping and Corporate Registry (LISCR) signed an agreement to revitalize and reform MET development and implementation in Liberia. This agreement followed a practical evaluation and validation by the IMO Maritime Safety Committee, of Liberia's demonstration of adhering to the STCW Convention 78, as amended.

This study seeks to explore the history of MET in Liberia as well as current and emerging issues, in addition to the challenges of human and technological resources facing the MET development and implementation process. The assessment of MET development and implementation in Liberia focuses on the "T" of the STCW Convention as the STCW Convention seeks to homogenize training and certification of seafarers. The study further reveals the link between human and technological resources and their impact on standards of training and competence. Furthermore, the data analysis by questionnaires and interviews were undertaken to complement the literature review and draw reasonable conclusions from the results of the study.

The findings of the study demonstrate the opportunities and challenges in the development and implementation of MET in Liberia as well as the deficiency in human and technological resources in MET – and the urgent need to develop these resources. In summary, the study provides propositions for best practices from regional and global MET experiences drawn from the literature review and deductions from the data analysis. If the recommendations and conclusion from the study are adopted, there would be efforts to augment the development and implementation of MET in Liberia.

KEYWORDS: MET, Human resources, Technological resources, Liberia

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LIST OF ABBREVIATIONS

AIM	Asian Institute of Maritime
CIO	Congress of Industrial Organizations
EU	European Union
EMSA	European Maritime Safety Agency
EPA	Environmental Protection Agency
ILO	International Labour Organization
IMO	International Maritime Organization
ITC	International Trust Company
ITF	International Transport Workers Federation
LiMA	Liberia Maritime Authority
LMA	Liberia Maritime Act
LISCR	Liberia Shipping and Corporate Registry
LMTI	Liberia Maritime Training Institute
MET	Maritime Education and Training
MLC	Maritime Labour Convention
MRU	Mano River Union
MoE	Ministry of Education
MoT	Ministry of Transport
NaFAA	National Fisheries and Aquaculture Authority
NMU	National Maritime Union (NMU)
RMU	Regional Maritime University (RMU)
STCW	Standard of Training, Certification, and Watchkeeping
PPAD	Pro-Poor Agenda for National Development
PRS	Poverty Reduction Strategy
QSS	Quality Standards System

CHAPTER ONE

1. INTRODUCTION

The global shipping industry is concerned about the shortage of seafarers and a means of retaining them (Caesar et al., 2013). The industry is arguably the most globalized workforce where shipping companies are primarily focused on recruiting from a multicultural set of specialized professionals (Gekara & Bloor, 2011). Contrastingly, seafarers from the world's largest shipping registries, including Liberia (Sampson, 2003). Seafarers from these countries are not listed among countries which lead seafarer human resources statistics (Drewry Manning Report, 2012). According to Lane (2000), the labor market for seafarers has vastly changed over the years, which has witnessed a declining number of national crew members.

The maritime industry has been paramount to global growth as well as national social and economic development (IMO, 2013). Over the years, the human element – technology and human resources have been considered a platform for safety and life at sea. Expressively, the training and education function of Maritime Administration is essential for providing a safe and productive working environment on board sea-going vessels. Hence, the development and effective implementation of the human element component of the maritime industry will ensure the industry remains vibrant and sustainable. Meanwhile, Maritime Education and Training (MET) is a direct and pragmatic approach used by industry practitioners and experts to address challenges associated with human and technological resources and as well competence and commitment within the shipping industry. Extending or cooperating across national boundaries, however, has resulted in the International Maritime Organization (IMO) dedicating expert views on training, recruiting, and retention of seafarers (IMO, 2013). Importantly, an understanding of maritime in Liberia in the context of delivering on the outcomes of the research study at finding the technology and advanced resolutions for better use of the sea and ocean resources linked to anthropogenic activities (Hildebrand and Schröder-Hinrichs, 2014).

Due to the global shortage of seafarers, onboard ocean-going vessels has increased immeasurably compelling seafarers to work longer hours on the vessels (IMO, 2013). The shortage of seafarers has led to the lack of enough rest time or vacation for seafarers. Thus, national programs and more broadly, global programs, are affected by the lack of work efficiency

resulting in derailed working conditions on ocean-going vessels due to the substandard safety conditions.

Globally, the availability of skilled and trained seafarers continues to dampen despite the economic decline and the reduced construction of new vessels (Drewry 2012). There are other challenges faced with the training, recruitment, and retention of seafarers in addition to providing a skilled workforce to sustain and support global shipping (IMO, 2013). These challenges correlate with the imbalance in the supply trade of seafarers – where the demand for seafarers surpasses availability and supply of seafarers. These challenges have also led to the drop in quality of seafarers that are trained to operate ocean-going vessels. This is a result of fast-tracking training and professional courses to ensure that specific requirements are met.

For decades, Liberia has employed efforts to align MET to requirements of the Standard of Training Certification and Watchkeeping (STCW) Convention but still appears to be a problematic task. Therefore, it is appropriate to assess MET condition in Liberia, including challenges and learning experiences from other maritime training institutions. The outcome of these assessments will provide policy recommendations for the development and implementation of the MET program in Liberia – and improving local participation and global representation.

1.1 Background

Liberia boasts of over 4000 vessels – of approximately 160 million gross tonnages, representing 12 percent of the world ocean-going fleet. For many years, the Liberian Registry has been regarded as a forerunner of the global maritime industry.

Liberia has little or no capacity concerning its seafarer program, which is the opposite of its global status as the World's second-largest shipping registry. Nonetheless, there is an urgent need for Liberia to build on the development of its seafarers' program to commensurate with its global fleet. The urgent need is predicated upon the critical role Liberia plays in global maritime as well as the desire to build national seafarers' program to enhance job creation and address poverty consistent with the Pro-Poor Agenda for National Development (PPAD) and the Poverty Reduction Strategy (PRS). Most importantly, Liberia needs to harness the potential of young Liberians and to develop social skills to serve on Liberian-flagged vessels.

Over the years, Liberia has set precedents to improve global shipping conditions generally. Liberia is a signatory to several conventions of the International Maritime Organization (IMO) including the Standard of Training, Certification, and Watchkeeping (STCW). The STCW for seafarers, 1978, sets the minimum qualification standards for training and certification of seafarers. Adopted in 1978 in London at the IMO, the STCW entered into force in 1984. The STCW Convention was meaningfully amended in 1995 – and consistent with the provisions of the Convention, the Liberia Maritime Authority (LiMA) periodically issues Marine Notices to provide policy direction for the effective and successful implementation of the Convention.

Liberia has endured over the years that these Conventions are upheld and implemented effectively. It is essential for the case of seafarers, and humans or human-related factors cause the safety of life and property at sea since 70 percent of maritime accidents.

Moreover, Liberia signed the Maritime Labor Convention (MLC), 2006 to implement relevant provisions of the Liberia Maritime Act (LMA) including terms and condition of seafarers training, recruitment, and employment, the minimum requirement for seafarers to work on ships and as well improved health and safety conditions.

The Liberia Maritime Training Institute (LMTI) is the only institution offering MET in Liberia today. The LMTI offers Marine Engineering and Electrical Engineering. However, LMTI lacks adequately qualified instructors. Also, there is a lack of appropriate simulation equipment and infrastructure for practical training in the absence of a training ship.

1.2 Statement of The Problem

Liberia has a long history of efficient shipping and has since entered the IMO “white list,” with an obligation to protect and effect minimum standards of training and certification of seafarers consistent with the STCW 78. The implementation and development of MET are challenged by the shortage of appropriately qualified instructors and assessors (Fuazudeen, 2011).

Besides, lack of adequate simulation equipment including infrastructure and a training ship is a significant inhibition for practical training for the MET institution in Liberia – presenting an added technological challenge. These challenges, however, continue to pose bottlenecks for the development and growth of MET in Liberia.

As stated earlier, there is a need for seafarers that are accessible and home-based. The Liberia Shipping and Corporate Registry (LISCR) recruits seafarers externally and lacks the framework for local conditions and empowerment which highlights the need to further develop local capacities to man ocean-going vessels flying the Liberia flag with most seafarers onboard Liberian-flagged vessels being non-Liberians.

1.3 AIMS AND OBJECTIVES

The purpose of this study is to explore the challenges faced by MET in Liberia, notably the Liberia Maritime Training Institute (LMTI) – the only MET institution in Liberia. Emphasis is placed on human and technological resources and assesses learning experiences from other MET to propose implementation and development strategies. The specific objectives are to:

- I. Examine the existing MET condition in Liberia;
- II. Identify the challenge of human and technological resources influencing the implementation and development of MET in Liberia;
- III. Review the STCW Convention as amended and assess its impact on the development of MET in Liberia.
- IV. Assess MET strategies employed by MET institutions external to Liberia and suggest how MET can be developed to support economic growth and development.

1.4 Research Questions

The study will seek to answer the following research questions to investigate:

- I. What is the historical situation of MET in Liberia?
- II. How are human and technological challenges influencing the development and implementation of MET in Liberia?
- III. What are the effects of STCW on the development and implementation of MET in Liberia?
- IV. How can learning experiences from other MET institutions support the development and implementation of best practices of MET in Liberia?

The findings of this study will, however, contribute to the development of MET knowledge in Liberia and provide policy recommendations to the Government of Liberia, and the Liberia

Maritime Training Institute (LMTI) on how to address challenges faced MET institutions generally. The policy recommendations would provide the requisite framework to develop a local-oriented and skilled workforce of seafarers as projected in the Government's Poverty Reduction Strategy (PRS) and the Pro-Pro Agenda for Prosperity and Development (PPAD).

1.5 Scope

The scope of this study will be defined by duration and geographical scope. It covers the period between 2016 through the middle of 2019. These three-year is significant for MET in Liberia which has proven to be a big step towards achieving a sustainable MET program in the country. It is also during this period that a legal framework for the rehabilitation and revitalization of the Liberia Maritime Training Institute (LMTI) was enabled the drafting and passing of the laws governing MET.

The geographical space covers institutions offering MET in Liberia, with reference to West Africa, and Europe (United Kingdom). The choice of the geographical span was based on the following explanations: The study of MET institutions in Liberia indicates the contemporary situation – discussing the history of MET in Liberia and evaluating prospects. An analysis of West African institutions such as the Regional Maritime University (RMU) vital as it provides a basis for regional comparison. Also, Liberia plays a significant role in the running of RMU – and currently serves as the Chair of the Board of Directors. Hence, as a developing country, Ghana, like Liberia, will provide insights such as the human and technological challenges which could likely be similar for both countries.

On the other hand, several MET institutions in Europe are developed in both human and technological resources and thus provide classic models for MET institutions in Liberia. This is true for the UK. The UK, as a developed country, could provide the chart to define what future needs the could prove worthy to propel MET in Liberia to a sustainable level in the long-term.

1.6 Methodology

This study will focus on investigating the challenges faced by MET in Liberia. The study employed the triangulation method in which more than one technique is used for a study to complement each other (Denzin, 1978). Three methods of research analysis were used for this study:

document analysis; semi-structured interviews; and questionnaires. These methods were used to collect data for this study to support analysis and reporting. It is, however, suggested that the triangulation technique improves the researcher's analyses by using the same information to validate and strengthen the results of the research. A detailed description of the methodology is provided in chapter 4 of this dissertation.

1.7 Expected Results

The study explores the challenges faced by MET in Liberia. After the research, the researcher anticipates that analyses will be drawn from the current state of MET in Liberia: the quality of existing programs and infrastructure; the number of Liberian seafarers currently trained and those numbers that serve on Liberia-flagged vessels. The study will further provide policy suggestions to the Liberia Maritime Authority (LiMA), and the Government of Liberia more broadly on the use of simulation and practical computer-based training. This will, however, provide an impetus to the trainees in securing cadet berths by STCW 78, as amended.

Also, the study aims to provide the pathways for the development and implementation of sustainable MET program in Liberia to address challenges associated with human and technological resources and establish a cordial working relationship with shipping and maritime-related institutions globally.

The study will hope to unveil the necessary support needed to create, rehabilitate, revamp, transform, develop and sustain MET development and implementation in Liberia – and how the Government of Liberia could coordinate relevant stakeholders in the maritime domain to improve stakeholders' participation on the national level. The study will further identify the roles and responsibilities of stakeholders to avoid potential overlap of functions to provide shared infrastructure, financial, and legal mechanisms to sustain a robust MET program in Liberia.

1.8 Dissertation Outline

This dissertation is systematized in seven different chapters. Chapter one presents an overview of the dissertation, including the background of the research, purpose, objectives, research questions, statement of the problem, scope, methodology, and expected results. Chapter two explores the literature review, and chapter 3 discusses the theoretical review of the research – in

a more detailed fashion. Chapter four discusses the methodology of the research in a more detailed fashion. Chapter five presents an overview of the data collection and analyses, chapter six discusses the findings and to conclude chapter seven summarizes the dissertation, outlines the limitations of the study and tries to make suggestions to address the challenges facing MET programs in Liberia and the development of MET institutions.

CHAPTER TWO

2. THE HISTORY OF MET IN LIBERIA

The prevailing global shortage of officers, several national and international initiatives are encompassing recruitment (Wagtmann & Poulsen, 2009, p306-23). This global shortage has informed the need and fast-tracking of research initiatives in maritime education and training. Recent studies indicate that the challenge is not only the lack of seafarers but the standard of training and development programs (Li & Wonham, 1999). Similar to reports from Li and Wonham (1999, p6), Froholdt & Hansen (2010) recognized that the findings regarding the Interreg IVB report suggest that the level of competence in the maritime industry of Europe is fastly declining both at the shore and sea.

IMO developed the STCW Convention, 1978 as amended to address the shortage of officers globally. In addition to the STCW Convention, the Manila Amendments of 2010 expands on competencies such as the emergence of new technologies and the need for competency for seafarers. Such competencies include teamwork and organizational development which are critical elements needed in the reduction of accidents occurring as a result of human factors.

The IMO has declared the implementation of the STCW Convention as a critical aim (EMSA, 2013), but emphasizes national governments as steering mechanisms. The emphasis on national governments is intended to display concerns about how MET institutions implement the STCW Convention, monitoring requirements, and uphold standards. According to EMSA (2013), the EU puts in a precautionary measure for both Member States and the Non-Member States to implement the STCW Convention and requirements by ensuring EU registered ships employ seafarers.

To meet global standards of competency as well as national requirements, Liberia is in the process of developing an improved MET system through the Liberia Maritime Authority (LiMA) and the Liberia International Shipping and Corporate Registry (LISCR) with the revitalization of the Liberia Maritime Training Institute (LMTI). The efforts of the relevant Liberian authorities aim to position seafarers on Liberian flagged vessels advantageously to enter the global labor market by equipping them with the required academic and professional competencies to qualify them to work safely and effectively onboard international fleets.

This chapter describes the historical overview of MET in Liberia, given the leading role of the Liberian flag in modern shipping. The description explores the STCW Convention 78, as amended to the development of MET in Liberia to address the global need of trained and skilled offers. Correspondingly, the account examines the human and technological challenges experienced in MET – thus reflecting on the development and implementation of MET in Liberia – drawing from experiences particularly from MET institutions in Liberia and other parts of the world.

2.1 A Historical Overview – Development of the Liberia Maritime Program

Liberia has a rich history when it comes to shipping. The Liberian Shipping Registry started prematurely as a result of the Second World War. There were some traces of the origin of maritime business in Liberia before the Second World War. The Kru and Fanti – two ethnic groups, predominantly found along the coast of Liberia had dominated fishing and coastal trade. The Kru is indigenous from Liberia, and the Fanti is non-indigenous originating from Ghana in West Africa. Across Africa, the Fantis are well known for their skills in fishing and coastal trade, integrated with the Krus along the coast of Liberia. Both ethnic groups use the dug-in canoe as boats to engage in fishing and related activities. Canoes used by the Fantis are more massive and often powered by outboard machines of 15 horsepower on average. The Fanti canoes are approximately 12 meters long while the Kru canoes are approximately 6 meters long – and carry a maximum of 3 persons at a time.

The development of the maritime tradition in Liberia was the result of the arrival of settlers from the Americans, otherwise known as freed slaves, to Liberia in 1822. These settlers were transported by skilled seafarers across the vast Atlantic Ocean by several sailing ships. Carlisle (1981) reported that more than 300 ships were engaged in commercial activities along the West African coast between 1847 and 1900 – most of which were constructed and owned by Liberian nationals. The introduction of sailing ships to the Liberian waters was a significant improvement in the maritime waters of Liberia. The transition was an embodiment of the economy of scale involving fishing and coastal trade along the coast of Liberia. In Carlisle's (1981) account, the takeover by sailing ships registered several over 300 built and owned by Liberians were involved in different commercial activities, p(14).

Moreover, the introduction of steam engines took over from sail ships and canoes. Engine ships, however, were the embodiment of the maritime heritage of Liberia before the second World War. Sailing ships have practically vanished on the Liberian waters with canoes remaining a maritime asset and a dominant feature in the marine and fisheries sector of Liberia.

2.2 A Historical Perspective: How Did Liberia Become a Maritime Nation?

The end of the Second World War resulted in several numbers of commercial ships formerly used for war-related activities. According to Carlisle (1981), the market for shipping had dampened with an increased number of tonnage as a consequence of the sale by the US government of over 1,113 ships to foreign interests, (p110).

According to Carlisle (1981), two main factors led to the beginning and development of the Liberian registry: the post-war Panamanian radical crises and the troubled American shipping industry. The attainment of a large portion of the global maritime fleet under the Panamanian flag flickered widespread protest among American and European maritime workers who were worried that the low labor conditions on Panamanian ships could undermine the high American and European labor rates and create unemployment. Organized labor became vocal. The National Maritime Union (NMU) and the Congress of Industrial Organizations (CIO) wrote to President Harry Truman of the United States separate grievances on the Panamanian labor matter. According to Carlisle (1981), Phillip Murray, President of the CIO, reported in his complaint that 16,000 Americans in the maritime industry lost their jobs between 1945 and 1947 because of the Panamanian registry (p112). Besides, the International Transport Workers Federation (ITF) pronounced a strong protest but deferred a definite global action awaiting the conclusion of an investigation by the International Labour Organization (ILO) into the worker's complaints (Metaxas 1985, p53-55).

In 1947, Stettinius created the Stettinius Associates, mainly to provide special economic assistance to Liberia. Actual operations were carried out by a subsidiary company – the Liberian Company - under a profit-sharing structure with the Liberian government and the Liberian Foundation, a Stettinius-run humanitarian organization stationed in Liberia (Carlisle 1981, p118).

Contacts were made with shipowners to enlist in the Liberian registry while drafting various legal documents by the Americans. Delta Shipping, Gulf Oil, Ludwig, and Onassis were among those

contacted and lined up for registrations under the Liberian flag. A well-crafted plan for ship transfers from the Panamanian registry was pending implementation. The only drawback was completing the Maritime Code.

The drafting of the Maritime Code was completed on 21 July 1948 but was delayed to early August to permit the leaders of the significant US shipping interest to peruse and approve it. Copies of the Corporation Code, the Charter of the International Trust Company (ITC) and a charter for the “Liberian Merchant Marine Company” as drafted by the Americans were sent to the Liberian Legislature in Monrovia for adoption (Carlisle 1981, p124).

It is uncertain whether President Tubman and his Legislature subjected the provisions of the American-designed Codes to democratic debate (International Trust Company 1975). According to (Carlisle) 1981, the American State Department articulated genuine concerns about the litigation process and demanded a review of the Maritime Code its associated international legal inferences. Carlisle (1981) reported that the Stettinius Associates submitted to the State Department’s pressure, by appointing Frances Adams Truslow as head of a Review Committee, (p126).

The Liberian Registry began its full operations in 1949 by registering its first ship – World Peace. According to the International Trust Company (1975, p6), the World Peace was officially registered under the Liberian Flag, under the charter of Gulf Oil – and owned by Stavros Niarchos. Various shipping company followed by contacting the Liberian Registry. Positively, the Liberian Registry surpassed the Panamanian Registry in 1956.

2.4 The Development of MET in Liberia

The roadmap towards the implementation of MET in Liberia started several years after the establishment of the Liberian shipping registry, as explained in the previous sections. Through a cadet, training program the Liberia Maritime Training Institute (LMTI) was established in 1979 as a training facility for maritime education and training for countries in the Mano River Union (MRU) – Liberia, Guinea, and Sierra Leone. This training program ceased with the collapse of national administrations during the civil crisis in 1990, creating a knowledge vacuum of qualified mariners in the MRU region, particularly in Liberia. Subsequently, Liberian seafarers desiring to attain an internationally recognized Certificate of Competence sought training overseas, which resulted in

an expensive venture, henceforward attracting fewer people. The pressure to establish MET institutions continued – although with a successful attempt to enter the IMO white list. The Government of Liberia, along with its Liberia International Shipping and Corporate Registry (LISCR), realized that it was necessary to establish a legal framework to develop maritime Liberia – and henceforth refurbish and revitalize existing structure. This initiative led to the reopening of the Liberia Maritime Training Institute (LMTI) in 2017, resulting with the improvement of program delivery, state-of-art infrastructure, new technology, and the appointment of competent national and international staff.

2.4.1 Contemporary Situation of MET in Liberia

Liberia is on the IMO's white list – and as such the ratification of the STCW Convention 78, as amended overlapped with the STCW Manila Amendments. These critical events place Liberia in a challenging position to both comply with the STCW Convention as well as implement the Manila amendments. While other IMO Member States are contending with the implementation of the Manila Amendments (IMLA6 2010, p.121; Ziarati et al. 2012) Liberia is also dealing with the fundamental challenges of implementation of the MET system including human, technological resources and creating an enabling environment for the development. Consequently, the situation could be seen as an advantage for Liberia, to deal directly with the STCW Manila amendments as a new project and not to change the existing pattern since change management is often complicated.

Moreover, a career at sea and the development of MET require the training of seafarers. It requires twelve months for officers taking charge of navigation watch and six months for officers taking charge of an engine room watch which is by STCW Section A-VII/2. Liberia faces a technological challenge as the State does not have a training ship or the relevant training platform that needs to be taken to secure cadet berths for Liberian trainees.

Table 1 illustrates a matrix which summarizes the view and the relationship between the size of MET institutions, technology, and development field to which Liberian MET institutions can refer to measure the type of equipment and technologies suitable for each type of institution.

Table 1. Development Matrix of MET Institutions. Source: Muirhead (2004, p157).

Continuums MET Institution	Computer Technology	Multimedia Technology	Simulation Technology	Delivery Methods	Communications
Training Centre	Computers	Audio-visual library	PC desktop	Traditional Classroom	Basic
Vocational Training Centre	Added accessories	CDR-CD-I Advanced	Single task	Classroom plus limited technology	Low speed links
Small MET academy	Special workstations	Digital technology	Part task	Computer laboratories	Medium speed links
Medium sized MET college	Networks LAN	Web page site	Full mission	Internet links	High speed links
Polytechnics Large institute	IT equipped classrooms	Authoring tools	Full mission internet interactive	Distance learning	High speed links
Maritime university	Interactive PC laboratories	Multimedia studio production	Internet interactive	Web education management system	Satellite links fibre optics

Recruitment of qualified staff consistent with the STCW Convention 78, as amended, is a significant challenge faced by the maritime authority of Liberia. Under STCW Reg. A-I/12, obtaining the appropriate equipment for practical training also remains a challenge. On the other hand, the STCW Convention emphasizes a competency-based approach to practical training. This approach ensures that the capability of seafarers is sufficient, and the ability to perform their tasks at sea is efficient.

2.5 STCW Convention 78, as Amended and its Impact on the Implementation of MET in Liberia

The capability and development of seafarers are critical to the effective operations of ships and the development of MET globally (ITF, 2010). According to ISF (2010), the STCW Convention has proposed a set of rules designed to improve standards of competence for shipping. However, this research study emphasizes the “T” as training. Furthermore, subsequent discussions on Sections A-1/6 of the STCW Convention will explore training and assessment as well as the use of technological resources such as simulators which impact training and assessment of seafarers.

2.5.1 STCW Convention A-I/6: Training and Assessment

The STCW Convention 78, as amended, requires training and assessment of seafarers to be written and adequately structured in order to support the development of seafarers. Moreover, it is recommended that the structural approach takes into consideration the manner of delivery and course materials. As posited by Cross (2015) and Fisher and Muirhead (2005), training and assessment of seafarers should as well be monitored, evaluated, and supported by qualified personnel.

To further guide the process for MET development and implementation globally – for safety at sea and the marine environment, the STCW code emphasizes training requirements and the competency of seafarers. Also, the relevance of academic knowledge has neither been weakened. However, it will be tasking for MET institutions to evaluate the required education level that is required. The assessment of tools (ISF, 2010, p40), in addition to the influence of decisions about qualified instructors for training and assessment.

According to Fisher and Muirhead (2005), the development of learning objectives and learning outcomes is a significant challenge for MET institutions. A direction is required from the IMO (Nakazawa, 2013) to develop and plan guidelines to guide the development of learning objectives as part of MET implementation globally. For example, Cross (2013) and IMO (2001) argued that it would be more efficient if instructors and assessors with a basic simulator training if they lack the requisite practical experience. Hence, a MET institution conducting a simulator training should assess and identify instructors and assessors with proven skills to deliver the relevant instructional techniques.

There are further requirements under the STCW Convention that promotes the development of learning objectives and outcomes; Section A-I/6 establishes the basis and provides the platform for a clearly defined goal and curriculum structure. Fisher and Muirhead (2005) suggest that examination methods such as assessment of competency should be displayed to ensure appropriate integration. Before the accreditation of MET institutions, the institutions should have defined goals in addition to learning outcomes. However, there is a challenge in defining a clear goal for the development and implementation of MET programs. For example, it was problematic for the LMTI to define concise goals consistent with the STCW Convention 78, as amended. The application for accreditation from the Ministry of Education became problematic, identifying clear

and defined goals aligned with qualified instructors and assessors to develop a MET program in Liberia. The instructors, however, must acquire, in addition to academic qualifications, seagoing experience, and simulator instructors be trained on the use of simulators.

Fisher and Muirhead (2005) argued that the shortage of instructors in the maritime industry is a common challenge to the development and implementation of MET programs globally. They further emphasized that instructors and assessors should be equipped with operational experience and instructional techniques to develop and adjust assessment methods and practical training.

2.5.2 STCW A-I/8: Quality Standards

The STCW Convention 78, as amended places emphasis on quality standards. Notable in Section A-I/8, this regulation complements the appraisal of MET institutions. MET institutions often lack comprehensive compliance with the absence of quality standards systems. The lack of compliance leads to the shortage of qualified officers working across quality standards systems.

Another aspect of quality standards is the demonstration of the scope of quality standards. The demonstration approach concerns the administration of the certification system, training courses, and programs, examinations and assessment, qualifications of instructors, and assessors. According to IMO (2013), the quality standards system is required to implement policy and systems control as well as quality assurance. The intervention often leads to the establishment of monitoring systems to define objectives.

2.5.2.1 The Framework for Quality System Management

By the STCW Convention 78, as amended, the external assessment of activities and management of the certification system must be employed at intervals not exceeding five years. This regulation guarantees that MET institutions produce seafarers of the optimum and required standards. Within this framework, the European Maritime Safety Agency (EMSA), for instance, carries out an audit in institutions within the European Union and non-European Union countries for recognition of certificates at the level of the European Union (EMSA, 2013).

MET institutions exist and operate in an open environment and are interdependent with elements and conditions existing in the system – see figure 1. MET institutions need to be sensitive and responsive to industry and regulatory requirements and provide programs relevant to client needs while designing quality standards. MET institutions, however, must prepare for scrutiny by certifying authorities, clients, sponsors, and the public (Karma, 1997). This approach is a practical tactic to acquire credibility, reliance, and ensure sustainable growth and development.

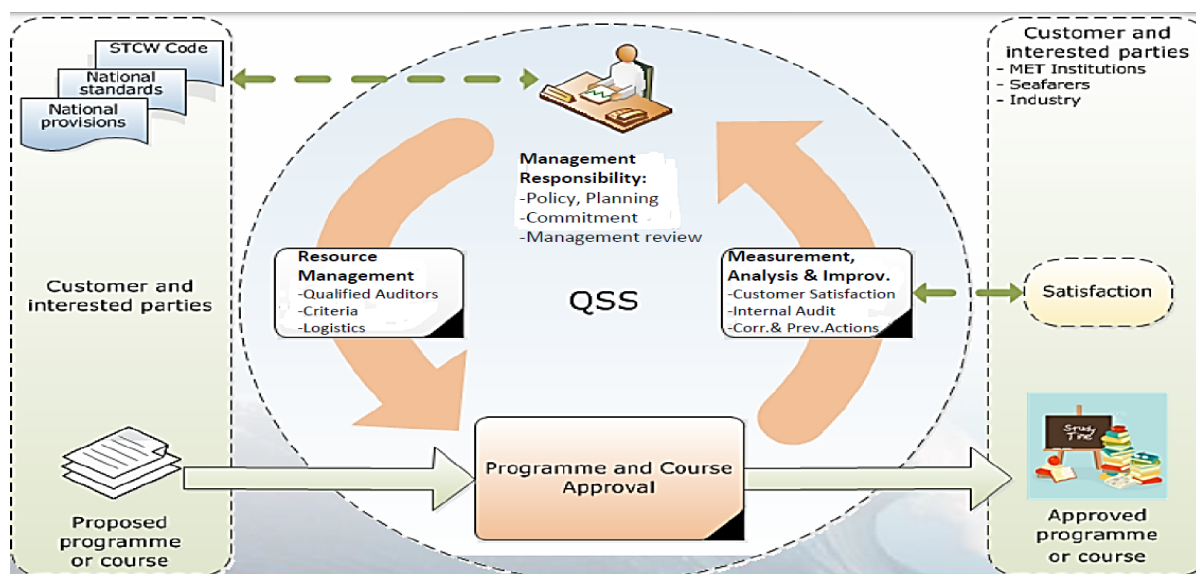


Figure 1: MET Certification System Diagram. Source: EMSA (2013).

The MET Certification System in Figure 1 demonstrates how the framework functions. The operating system displays the process of MET certification, including the elements of a Quality Standards System (QSS) function effectively with a potentially high-performance rating.

2.5.2.2 Achieving Quality Standards in Quality Standards Systems

Quality standards are not expressly defined in Section A-I/8 of the STCW Convention 78, as amended. However, it is essential to determine what a certification organization must refer to as quality – an example is the case realism when relating to simulators or adequate training conditions. Waters (1996) holds the view that there is no global standard set for a right or wrong way of establishing a quality system, and the challenge is how to understand the gap between objectives and outcomes. Several studies have however acknowledged that establishing MET institutions must take into consideration the national system, the institutional mission statement,

organizational structure, courses offered, examination procedures, resources available, governmental authorities, industry, internal and external monitoring and evaluation system – see (DNV 2005; Fisher and Muirhead 2005).

2.6 STCW Convention A-I/12: Standards Governing the Training and Use of Simulators

The STCW Convention 78, as amended, makes provision for performance standards for mandatory simulator training and assessment which MET institutions must implement to achieve compliance.

The STCW Convention recommends that the use of simulators is mandatory for Automatic Radar Plotting Aid (ARPA) and Radar training and provides a framework for performance standards. Similarly, States who are parties to the Convention are using simulators for training and assessment of any competence or continued proficiency; such simulators must comply with performance standards consistent with the STCW Convention 78, as amended (IMO 2011; Fisher and Muirhead 2005).

2.6.1 Goals and Objectives of the Training Program

The training characteristics determine the type of simulator or equipment that must be acquired and used for the training. Deniz et al. (2004) describe the use of Simulator I to facilitate apprentices to understand operations during watch duties and respond to emergencies. This type of simulator is suitable for lower levels of training. On the contrary, The Simulator II is ideal for higher levels of training. Simulator II, however, reinforces the learners' comprehension of team and resource management, communication, and other managerial skills.

2.6.2 Simulator Instructor and Assessor Competencies

Instructors and assessors play a crucial role in delivering competency-based training as specified in Section A-I/12 of the STCW Convention 78, as amended. According to Barnet (1997), Section A-I/12 is reinforced by Section A-I/6. He emphasizes that instructors and assessors are experienced in the subjects and practical training assessed. This assertion is further propagated by Pols (1997), who asserts that instructors and assessors should be adequately trained,

qualified, and experienced. Moreover, simulator manufacturers must organize training of instructors or simulator operators (Cross, 2013; Kongsberg, 2013).

2.7 Challenges of Human Resources

This section of the literature review focuses on the human resources challenges in MET that Liberia faces according to the dissertation objectives.

2.7.1 Definition of Human Resources

Human resources are people in organizations, endowed with a range of abilities, talents, and attitudes (Brantton and Gold 1999). They are referred to as human resource based on their respective roles; they assume in the organization. In a publication on education and competence development in the EU regarding maritime educating and training, Froholdt and Hansen (2011) recognized maritime education and competence development as a part of an institution's human resource strategy. Subsequently, both authors argue that the human resource strategy requires urgent attention to sustain and develop competencies and maintain a competitive position in the global labor market.

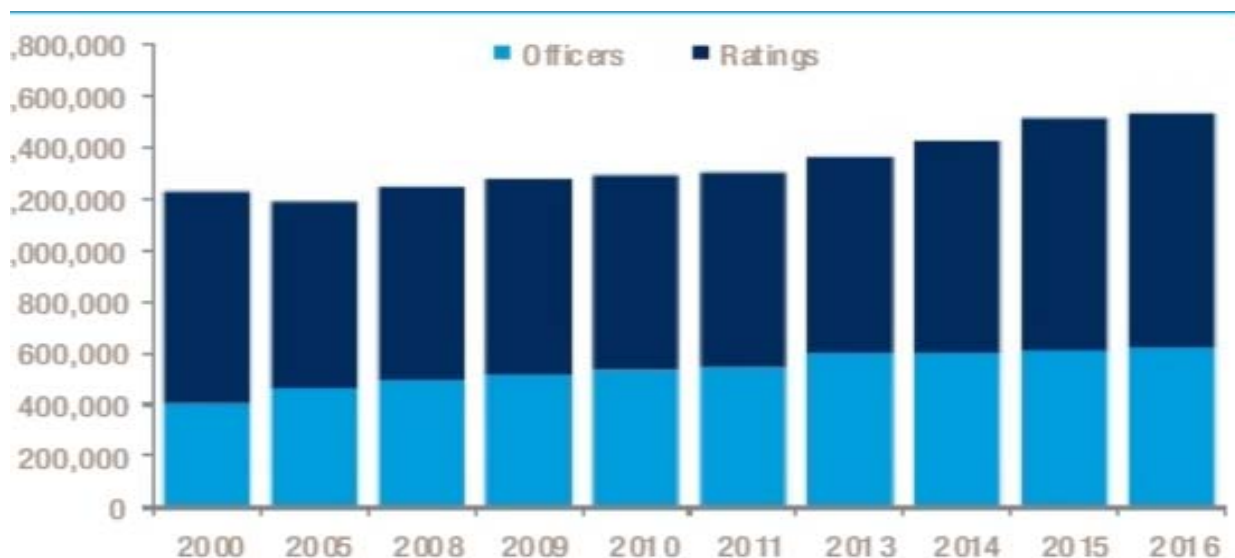


Figure 2: World Seafarer Numbers, 2000-2016. Source: Drewry Maritime Research (2017).

Quantifying seafarer supply is problematic given that there is a generally accepted view that ratings are in continuous oversupply – see Figures I and 3. However, this does not mean that this

surplus is made up of seafarers that are always available for duty (Drewry Maritime Research, 2017).

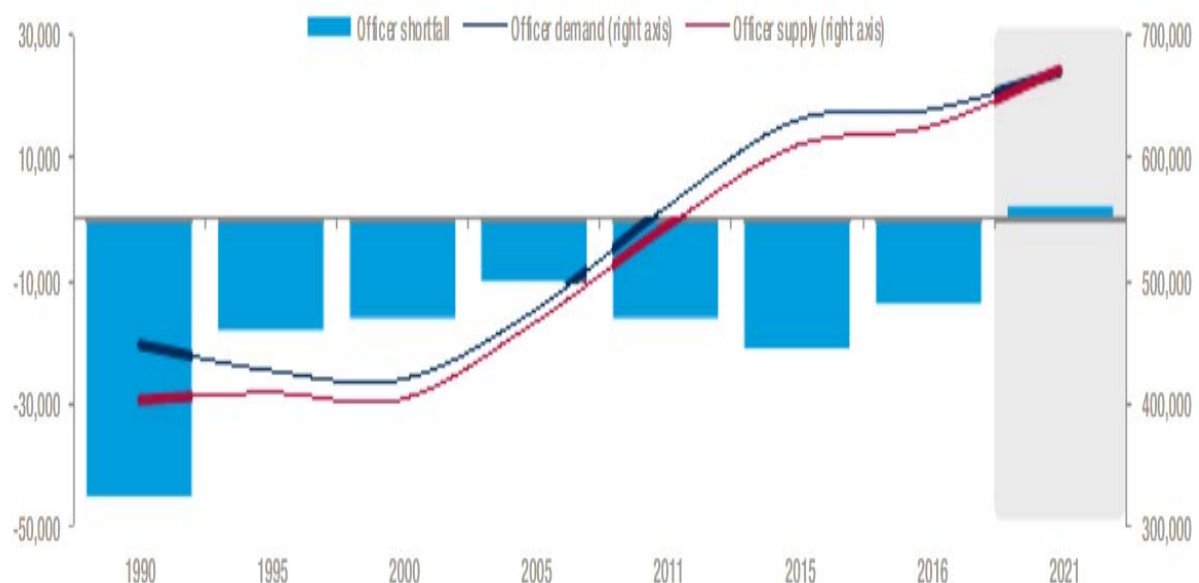


Figure 3: Evolution of Officer Supply/Demand, 1990-2016

On the other hand, demand for seafarers is determined by the varying size of the global fleet, while a mix of legal limits dictates crewing numbers, and beyond this, owners' preferences. The latter, for example, might not include creating space for the employment of cadets.

Contrastingly, the maritime industry is faced with a shortage of qualified officers as seafaring is not a typical career of choice among the young people; and when they take it, they soon leave for shore employment (Cahoon and Haugstetter 2008). An intensive and the far-reaching method by all stakeholders in the maritime sector is projected to make the shipping industry an attractive industry for the younger generation to attract moreover, retain, and lure in shipping companies globally.

2.7.2 Knowledge Gap in the Maritime Sector in Liberia

The collapse of the training program for mariners aided by the Government of Liberia and Mano River Union (MRU) countries up to 1990 and the need for Liberian seafarers to individually seek training overseas resulted in a breakdown in the knowledge spiral – and thus creating a

knowledge gap for the maritime industry. The Government of Liberia seeks to seal this gap by creating the appropriate environment to promote MET in Liberia.

Knowledge management requires an innovative start as a result of the lack of national seafarer training. However, the shortage of qualified personnel globally affects the distribution and fulfilment of qualified staff at the national level. The lack of adequate numbers of personnel, however, often leads to the shortage of qualified instructors and assessors.

As a support mechanism, the Government of Liberia in consultation with the Liberia Maritime Authority (LiMA) and the Liberia International Shipping and Corporate Registry (LISCR) should endeavor to motivate qualified MET personnel. This motivation would lead to facilitating the conversion of tacit knowledge into explicit knowledge. Subsequently, Nonaka and Takeuchi (2007), acknowledge the creation of knowledge by individuals, to develop MET institutions and practical training in Liberia.

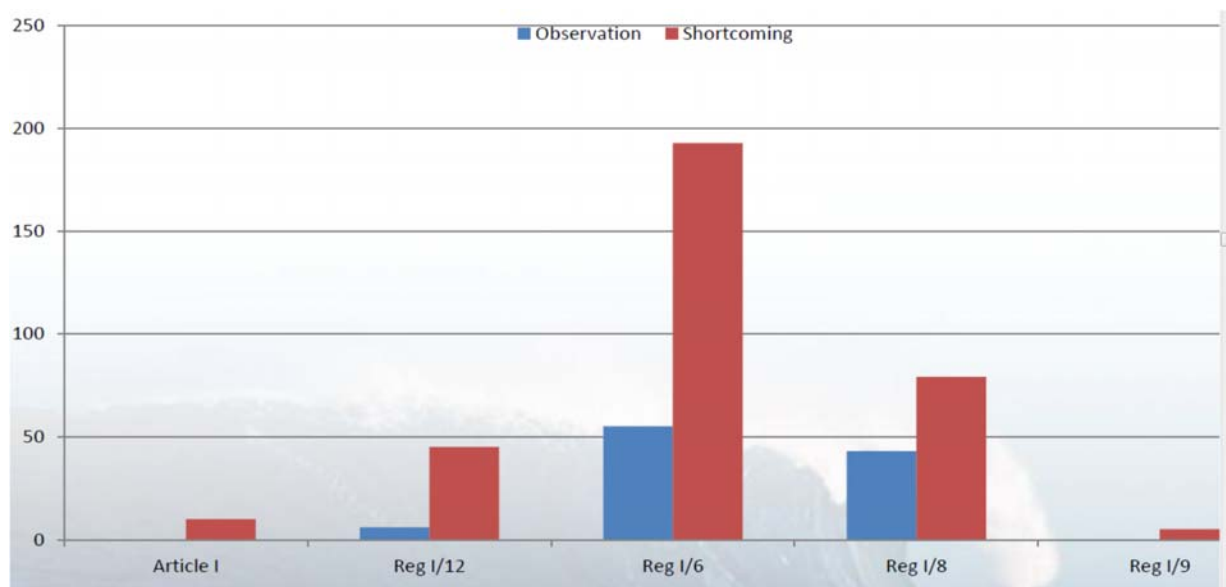


Figure 4. Compliance Levels in MET concerning STCW Convention 78, as Amended. Source: EMSA (2013).

This study acknowledges that there is a shortage of appropriately qualified human resources in MET institutions. The response to this question is re-emphasized by the analysis represented by Figure 15 from EMSA, which shows the highest shortcoming in compliance with the STCW Convention is in Regulation A-I/6 on lecturing and assessment. However, the respondents were

keen to signpost that States which are parties to the STCW Convention, through respective maritime administrations, have the responsibility to ensure that instructors and assessors are qualified to undertake training and possess competencies required by the STCW Convention 78, as amended.

CHAPTER THREE

3. APPROACHES TO MET DEVELOPMENT AND IMPLEMENTATION STRATEGIES

3.1 Introduction

The development and implementation of MET in Liberia have not developed as anticipated. Compared to the global reputation, Liberia has garnered as a leading international shipping registry. Moreover, Liberia has lagged in developing, effectively, the capacity of seafarers proportional to its global maritime program. This research, however, has identified potential challenges for developing and implementing a sustainable MET program in Liberia using two theories – knowledge management and goal-based learning.

3.2 Knowledge Management

Under the deliberations by Shannak (2009), knowledge management is often applied to a wide range of areas of study to manage and create knowledge. Knowledge management is critical to the development of MET institutions – and has been supported by various scholars in the field of knowledge management (Gao et al., 2018). Besides development, knowledge management supports the improvement of MET institutions and modification of MET programs by achieving decision-making and sharing best practices.

There is no limit to where knowledge management can be applied, ranging from individual learning, small enterprises to large multinational corporations. Knowledge management has become gradually more significant for people to understand what information is vital, how to manage this crucial information and how to convert essential information into permanent knowledge (Tseng et al., 2012). Knowledge management, however, plays a fundamental role in the success of an organization's activities and strategies (Castrogiovanni et al., 2016). Consequently, managing and using knowledge successfully is essential for both individuals and organizations to take full advantage of the value of knowledge (Currie and Hlupic, 2003).

Organizations incessantly strive to improve their business performance; hence, they develop business process reform efforts. However, reform has mainly been a personal chore, which relies on human perception and creativity, while several analysis tools can support it by identifying

development opportunities. The approach draws together different aspects of business processes, including goals, context, and actual paths. This approach also leads to the development of a learning cycle, such as the learning phase, where the appropriate situation is identified and used for making improvements in the setting up of a model. The development process allows for the improvement for the specific model to and actual results are stored for the next learning cycle. This cumulative effort drives the essentials for a goal-oriented approach that is essential for learning to improve process and development outcomes.

Improving the performance of an institution over time is also associated with the concept of organizational learning, which is defined as the capacity of an organization to improve its performance based on experience (Nevis et al., 1995). A central idea of organizational learning refers to when people can learn from experience. Knowledge has to become shared and applied within and across the institution to facilitate constant development. The knowledge an individual has can be demonstrated in decision criteria used for selecting a process path at a specific situation or in deviations from a predefined process model in order to solve specific problems. Such knowledge is gained through errors as well as a successful method of performances.

Knowledge management, however, has become a critical factor that determines organizations' capability to face the changing needs of employees and customers, the pressure from competitors and the constant technological change (Nonaka and Takeuchi, 1995; Scarbrough, 2003). The development of knowledge management is not a goal itself; literature relates it to advanced performance (Nonaka and Takeuchi, 1995). This transition has driven several studies concerned with analysing this link; it pursues improving services, processes, decision-making practices, and marketing.

Nevertheless, in Liberia, there have been no studies conducted on knowledge management or goal-based learning, maybe because innovation is understood mainly as a phenomenon exclusively related to technology and research and development (Robledo and Ceballos 2008) where interaction and knowledge creation derived from the interaction among the members of an organization has been undervalued or even overlooked.

Knowledge management is challenging to define, just like knowledge itself (Earl 2001, p215). Nevertheless, we believe that defining what is understood by knowledge management may be somewhat more straightforward than defining knowledge as an individual unit. The idea of 'management' gives us a starting point when considering, for example, the activities that make it up, explaining the processes of creation and transfer or showing its main goals and objectives without the need to define what is understood by knowledge. Consequently, there are more ideas and definitions on knowledge management in literature than just on knowledge, although these are not always clear as there are many terms connected with the concept.

Knowledge management and training are essential and directly linked parts within a single framework. For example, knowledge management will support the overall development and implementation of MET in Liberia by giving rise to the proper management and control of institutional memory – the knowledge which forms the basis of an institution. As a result of institutional knowledge, a virtual classroom evolves, which in addition to the classic simulation or live-training program, makes interaction possible despite "virtual learning." For example, the interaction or radar simulator and how to reproduce or replicate the real-environment. Mainly the exchange of practical experience and interaction such as simulator training which are land-based, and discussion settings, which is one of the most effective means of simulation training. However, the MET development process is cognitive – and thus, institutional memory which is collected, managed, systematized and made accessible to individuals working within the institution through a knowledge management program, could work dynamically sharing knowledge and new information with individuals and institutions that are interested in developing capacity and accomplishing the MET development objectives.

However, Knowledge management 'deals with the management of knowledge-related activities such as creating, organizing, sharing, and applying knowledge in order to create value for an organization. Knowledge management is promoted as an essential basis for companies to develop sustainable competitive advantage and to continue at the front of quality in a level playing field (Yew and Aspinwall 2004, p44).

3.4 Goal-Based Learning: How Goals and Process Enable Learning

Experts and academics have described the means of studying and evaluating various mistakes that lead to failure and the adaptation to avoid them as learning from experience. This sequence often leads to the application of the same process successfully. The failure or success of a learning process is adequately evaluated when goals are identified and itemized (Soffer et al. 2004).

According to Soffer et al. (2004), the ultimate goal of a process as a set of stable conditions at a point where the process terminates is referred to as goal-based management. The start of the process identifies a specific goal over a particular set of variables of the area over which the process is carried out. Once the process is realized to attain a position in the area across which the process operates, its base facilitates conditions which support the underlying process to achieve specific goals so the process can terminate.

Soffer et al. (2004) describe two kinds of goals: 'soft goals' and 'hard goals.' According to Soffer et al. (2004), soft goals refers to particular properties which are achieved in twofold. For example, when considering business processes, soft goals link to performance indicators whose increased values are required, but they can only be considered adequate in contrast to others (Snell and Grooters 2001). The performance indicators are assigned benchmarks, where values above these benchmarks are considered positive, and values below the benchmark are considered harmful. In summary, the process of learning in a business environment should endeavor to seek values above benchmarks to achieve the overall objectives of soft goals.

A Goal-Based Approach for Learning Processes in the Context of the Liberia Maritime Training Institute

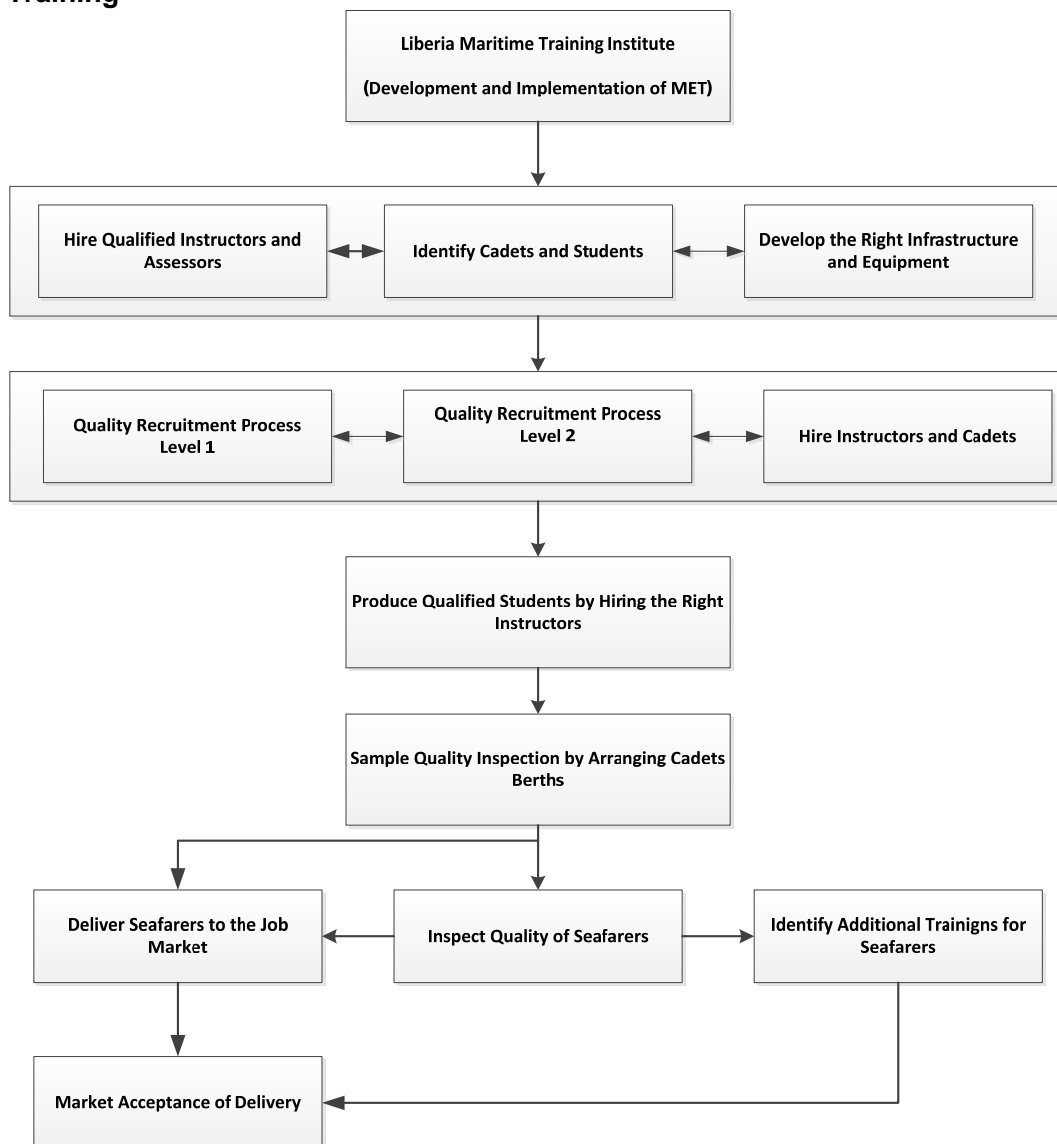


Figure 5. MET Development Process

Figure 5 illustrates the recruitment and training process of cadets and students of the Liberia case scenario. This process is a proposed framework which could prove useful to improve the development of MET in Liberia. Product in this demonstration refers to an individual or student recruited by the National Maritime Training Institute.

Soffer et al. (2004) define 'hard goal' as a process of an event which realizes the state where customer's approval of delivery is actualized. When delivery of a process dismisses, there are

reasons linked to the quality of the problems that exist. On the contrary to hard goals, soft goals correspond to increasing the number of qualified MET instructors and assessors, as well as improving the quality of the seafarers and reducing the overall development costs by building partnerships. Table 2 presents the leading causes for poor achievements of the defined soft goals.

Table 2. Soft goal – Reasons for Poor Achievements in the Liberia Maritime Training Institute

Soft Goals	Main Reasons for Poor Achievement
Meeting delivery due dates	Quality problems, lack of infrastructure and equipment, lack of qualified instructors and assessors
Increasing process utilization	Set up schedules, quality problems, lack of technology including simulation equipment
Increasing the number of qualified MET instructors and assessors	Quality problems, inappropriate infrastructure or equipment, lack of political will
Improving the quality of seafarers	Inappropriate infrastructure and equipment lack of infrastructure and equipment, lack of qualified instructors and assessors, lack of political will, inappropriate quality inspection
Building partnerships	Funding mechanisms, political will, labor cost

Table 2 illustrates the main reasons for reduced professional results are quality problems, lack of infrastructure and equipment, lack of funding, and political will. Based on this analysis, the focus on the soft goals of increasing the performance quality will affect all the other soft goals, including the costs, by increasing the quality of MET instructors and assessors.

Snell and Grooters (2001) documented efforts to make governments practical and results-oriented. Such form of documentation has been described as a kind of 'reform' (Snell and Grooters 2001). Snell and Grooter (2001) refer to these reforms as performance management in which data as a result of performance are collected and disseminated. This scenario provides decision-makers the platform to learn more about information performance with the tendency to improve institutional performance.

According to Argyris and Schön (1996), there are two types of learning may occur in organizations: 'single-loop' learning and 'double-loop' learning. Argyris and Schön (1996) describe single-loop as a form of instrumental learning that leads to improvement in the

performance of organizational tasks (p20). The single-loop learning, however, is fitting for operations that are carried out repeatedly.

On the other hand, ‘double-loop’ learning is learning, as described by Argyris and Schön (1996) is a result of a change in the use of theories and associated strategies which questions the ultimate goals of a program. For example, the LMTI must demonstrate the willingness to revisit the fundamental organizational mission, goals, and strategies regularly – which is a demonstration of ‘double-loop’ learning.’ According to Senge (1990), learning is based on shared experiences, norms, and understandings that foster intelligent behavior

Table 3. Liberia Maritime Training Institute Case-Characteristics and Outcomes

Case Outcomes	Learning Outcomes	Suggested Outcomes
Single-loop learning	Occurred in several instances among a variety of LMTI actors central to LMTI	Must occur to a limited degree – without much frequency for a national institution such as the LMTI
Double-loop learning	Did not occurred	Should occur among the LMTI leadership to successfully promote dramatic policy change
View of managing for results	Provide a management tool to promote and demonstrate the performance improvement	Learning to understand and communicate policy choices and outcomes
Learning forum	Used throughout the organization; promotes the managing of results requirements, but without formal routine or structure; focused on small-scale recruitment	Must be used by high-level actors for major strategic decision-making
Major challenge	Further formalizing of performance-improvement efforts	Obtaining buy-in from institutional staff and partners on new policy goals

CHAPTER FOUR

4. METHODOLOGY

This chapter provides a comprehensive overview of the methods used to carry out this research spanning from the data collection process to the sample selection to data analysis. The study adopted three methods of research techniques, including literature review, questionnaires, semi-structured interviews, for data collection. This method of the use of multiple research techniques is called triangulation. Researchers use triangulation (Denzin 1978) where there is a need for different techniques to complement and reinforce each other, (p339-342). Triangulation started from the field of navigation where a location is determined by using the angles from two known points. Triangulation, however, is the mixing of different methods or data types so that diverse viewpoints cast light on a particular topic. The blending of data type helps to validate the claims that might arise from initial pilot research. Using several techniques, such as triangulation, enables the researcher to evaluate the same data using different techniques to validate and support the soundness of the research results.

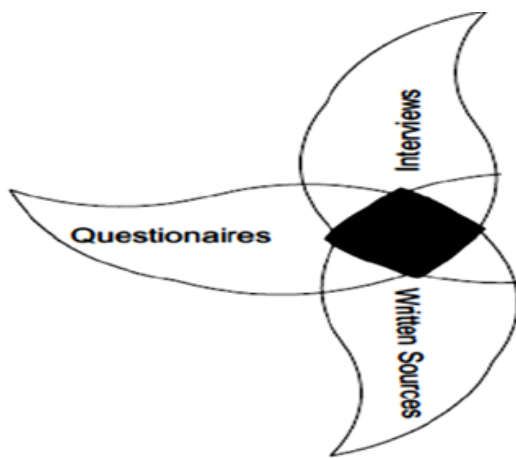


Figure 6: Methods of Triangulation. Source: Kane (1990).

4.1 Types of Data Sources

The source of data for the research included primary and secondary sources.

4.2 Primary Data Source

The Primary data was collected through questionnaires¹ which were transmitted to:

The Liberia Maritime Authority (LiMA), Liberia Maritime Training Institute (LMTI), Environmental Protection Agency (EPA), Fisheries and Aquaculture Authority (NaFAA), Liberia International Shipping and Corporate Registry (LISCR), and Ministry of Transport (MoT).

Supplementary data from semi-structured interview² communicated to respondents at LiMA, Kenya, and the Philippines was considered as part of this study.

4.2.1 Questionnaires

The questionnaire was used to assess the current situation of the implementation of maritime education and training in Liberia, challenges facing the development and maintenance of MET set-ups, and exploring lessons from established MET institutions. The questionnaire was structured to expound on how the challenges of human and technological resources impact the implementation of the MET process consistent with the STCW Convention 78, as amended. The questionnaire, however, was used as a data collection instrument for its convenience and cost-effectiveness (Philbrick et al. 2010). The comfort and cost-effectiveness were quite useful, considering the geographical remoteness of MET institutions and experts in Liberia and Europe.

Besides, Gillham (2008) outlines the advantages of using questionnaires for data collection mechanism – these include (p6):

- It provides respondents' anonymity
- It is a unique method to collect information from other respondents – snowball sampling
- It is cost-effective in terms of financial resources
- It provides convenience for respondents to complete the questionnaire within a timeframe suitable for them
- It contains less stress for immediate response than other forms of data collection techniques
- It reduces interview bias

4.2.2 Interviews

¹ See Appendix A – Questionnaire

² See Appendix B – Interview Guide

An interview guide was developed to control the conduct of the interviews for the development and management of MET in Liberia. According to Kvale (1996), the interview guide is intended to contribute thematically to the creation of knowledge and ardently to promote a good interview interaction (p129).

Besides, this data collection tool was also chosen for its ability to provide clarification as well as to encourage respondents to provide more profound responses to open-ended questions (Brace 2004, p24). The selection of this method was based on the fact that respondents in these institutions have a vast knowledge of MET as well as informed of the challenges that institutions face in the implementation of MET in different countries. Moreover, the interviews provided instantaneous feedback during deliberations, which was convenient for the respondents as well as the researcher.

4.3 Secondary Data Source

The secondary sources of data for this study include the IMO Conventions, Circulars, STCW Convention 78, as amended, MET, reports from the Government of Liberia, and LISCR, EMSA reports, and these by World Maritime University.

4.5 Data Analysis Technique

This dissertation adopted a qualitative technique of data analysis, which chiefly refers to a non-numerical data collection process. Several disciplines select this method of inquiry – in the social sciences, ethnographic studies, and market research (Sapsford and Jupp 1998). According to Moon (2002), the qualitative method of inquiry aims at ‘the gathering an in-depth understanding of human behavior and the motives that govern such behavior’ (p11). Swetnam (2007) emphasizes that it is valuable for making an inference from the questionnaires and semi-structured interviews.

Some academics argue that quantitative methods of data analysis provide more validity and consistency, a practical choice of data analysis is contingent on the nature of the problem statement (Swetnam 2007) – and as part of this study, the most logical method of data analysis was found to be the qualitative approach, (p.56).

4.5.1 Description of the Questionnaire and Interview Guide Structure

The researcher structured the interview guides and questionnaires consistent with the objectives of the research to answer the research questions while exploring the challenges of human and technological resources and potential to develop in MET Institutions in Liberia as outlined as follows:

Questions about technological resources challenges include:

1. How is practical training and assessment undertaken in your institution?
2. What challenges are you facing in practical training?
3. How do you obtain equipment for practical training?
4. Which institution/s conducts the academic and competency assessment?
5. What strategies do you have for sea training?
6. Who carries out an audit on your institutions quality standards?

Questions about human resources challenges include:

1. How long has your institution offered MET?
2. What is the classification of your MET institution?
3. What are the levels of training offered by your institution?
4. Which specializations of Maritime Education and Training (MET) do you offer?
5. How many MET specialist teachers do you have?
6. Have you had any difficulties in recruiting appropriately qualified teachers and assessors as per the STCW 78 Convention as amended? If yes, how do you mitigate the shortage of MET specialist teachers?

4.6 Data Presentation Technique

The study adopts a descriptive statistical method. This method is employed to describe and characterize the different variables designated as themes to support the findings of the study. The data, using multiple means, were collected, organized, and presented using tables, and figures (Singh and Bajpai 2009).

4.7 Limitation of Data Collection

The geographical dispersion of MET institutions identified for this study limited the data collection process to an extent. The geographic distribution was one of several reasons for using questionnaires transmitted by electronic mail as a data collection tool for this study. Another limitation is the number of MET institutions, particularly in Liberia and Africa, which are considerably few and therefore hindered the acquisition of a larger sample for data collection.

Correspondingly, a large number of the respondents approached were not willing or perceived to be uncomfortable to provide the essential information. Some respondents required anonymity to participate in the study, which was resolved through the use of questionnaires where the signing of a consent form approved by the Ethics Committee of the World Maritime University assured anonymity.

Most people either did not respond to the request to participate in the study after several follow-ups or delayed in responding to the invitation to participate, which hindered the collection and processing of datasets. According to Kane (1990), most people do not react or delay in responding when there is no face to face encouragement, or they might not have clearly understood the questionnaire. To ensure that questionnaires were completed within a specific timeframe, consistent follow-up was made to guarantee speedy responses.

CHAPTER FIVE

5. DATA ANALYSIS AND FINDINGS

5.1 Introduction

This chapter presents data collected to explore the contemporary situation of MET in Liberia and the human and technological resource challenges and lack of political will facing the MET implementation process. This process follows an IMO needs assessment report of the Liberia Maritime Training Institute (LMTI) which started seafarer training in 2017. The outcome of the report recommended that the investment adequately qualified MET human resources and training equipment such as marine simulators and well-equipped laboratories. The Liberia Maritime Training Institute (LMTI) started training seafarers at different levels, including support, operation, and management in 2017. This chapter, therefore, endeavors to present the data collected through questionnaires and interview guides.

5.2 Data Analysis

The study analysed data collected by the use of an interview guide and questionnaire. The analysis of each question includes a detailed description of the situation as described by respondents.

5.2.1 MET institution history

The data collected throughout the study shows that Liberian institutions actively started MET programs in 2017. In comparison with other MET institutions across Africa – and other parts of the world, the data collected indicate that the Liberia Maritime Training Institute (LMTI) is the only institution in Liberia that is offering MET programs which started in 2017 due to several years of political instability. The analysis shows that the single MET institution in Liberia is still in its early stages – committed to revamping and rehabilitating MET in Liberia has the lowest experience in years of operations as a MET institution.

Although there is one MET institution that is accredited by the Ministry of Education (MoE) to provide MET in Liberia, there are several maritime professionals trained by the World Maritime

University (WMU) and Regional Maritime University (RMU). Most of these maritime professional's work with different agencies of government – such as the Environmental Protection Agency (EPA), National Fisheries and Aquaculture Authority (NaFAA), Liberia Maritime Authority (LiMA), Liberia International Shipping and Corporate Registry (LISCR), and Ministry of Transport (MoT); but also provide professional services to the Liberia Maritime Training Institute (LMTI). Based on the data collected for this study, there is a relationship between LMTI and relevant government agencies. Due to the limited human resource capacity in the maritime sector, maritime professionals work across different institutions providing support based on institutional mandates and operations of that institution.

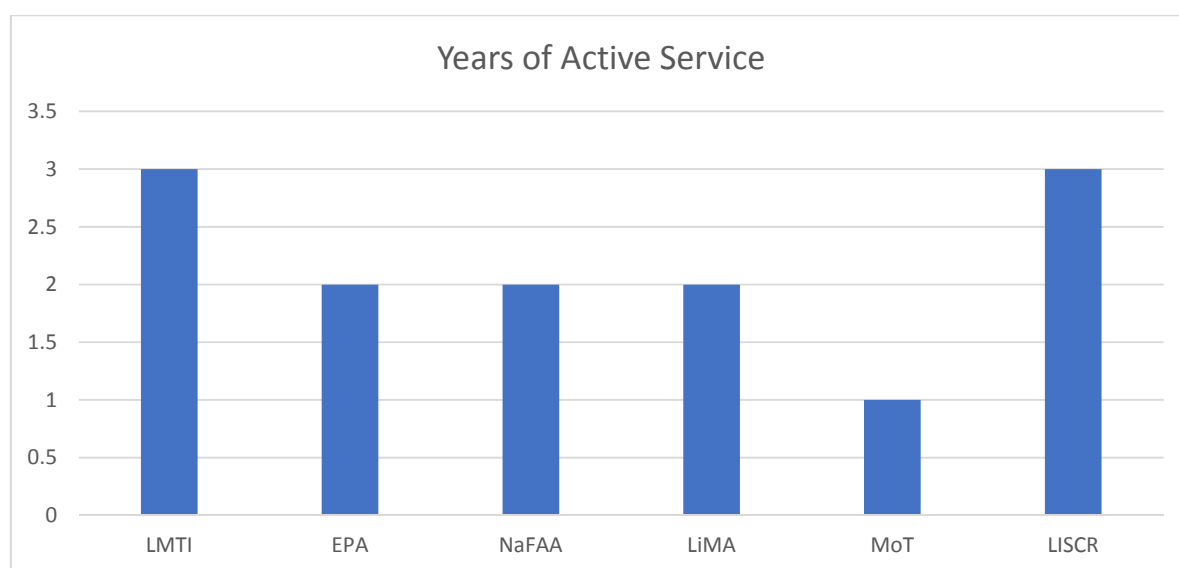


Figure 7. Years of Active MET Service from 2016 to 2019

In Liberia, the researcher identified maritime practitioners that work for the government agencies but also provide training and teaching support to the LMTI to support and develop the MET component of the Liberia maritime industry. Respondents were identified from the Liberia Maritime Training Institute (LMTI), Environmental Protection Agency (EPA), Liberia Maritime Authority (LiMA), Liberia International Shipping and Corporate Registry (LISCR), National Fisheries and Aquaculture Authority (NAFAA), and the Ministry of Transport (MoT) – see Figure 7.

There is a direct relationship between the Liberia Maritime Training Institute (LMTI) and institutions the study refers to as government agencies such as Liberia Maritime Authority (LiMA),

Liberia International Shipping and Corporate Registry (LISCR), Environmental Protection Agency (EPA), National Fisheries and Aquaculture Authority (NaFAA), and the Ministry of Transport (MoT). These government agencies are chiefly supported by personnel trained by the Regional Maritime University (RMU) and the World Maritime University (WMU). The LMTI has been renowned for MET training and implementation in the West Africa sub-region since the late 1970s. The civil crisis in the 1990s led to the dampening of trained educators and instructors, which affected the LMTI. For this reason, the LMTI lacks qualified staff and trained faculty. Besides, the LMTI cannot accommodate qualified instructors and assessors on a full-time basis due to the lack of funding. To solve the problem, the LMTI has embarked on a strategy to hire qualified staffs on a part-time basis that are employed with government agencies such as LISCR, LiMA, MoT, NaFAA, and EPA.

Figure 7 visually compares value across a few categories – where the size of each rectangle is indicative of the number of years that each institution has provided MET services or has contributed staff to the development and sustenance of MET programs in Liberia between 2018 to 2019. The LMTI has actively provided MET services for approximately three years in Liberia. Through the LISCR program, LMTI was revamped and rehabilitated to meet international standards consistent with the STCW Convention 78, as amended to train cadets as seafarers for the global shipping industry. The LMTI has actively worked since 2017 to support the development of MET in Liberia – through the Ministry of Education and the Institute of Higher Education. Government agencies that participated in the study have staffs in their employ that have provided technical support for over a year.

5.2.2 Classification of MET institutions

This question had multiple-choice options to probe the understanding of the respondents. The study explores the possibilities for classification of institutions, including training institute, college, university, and others in case of a different category of institution. The question was designed to provide the basis to the exploration of the contemporary situation of MET in Liberia. The researcher aimed at understanding the classification of institutions offering MET in Liberia. The data collected from different institutions indicated that out of the four institutions in Liberia – from which we received responses to the questionnaires, only one is a training institution – the Liberia Maritime Training Institute. Other institutions include the Ministry of Transport, the Liberia Maritime Authority, Liberia International Shipping, and Corporate Registry, Environmental

Protection Agency, and National Fisheries and Aquaculture Authority. None of these Liberian institutions is a maritime academy, and they are not accredited to administer any academic programs or MET.

There were a total of ten respondents from 6 national institutions that reacted to the questionnaires – see Figure 1. The Liberia Maritime Training Institute (LMTI) represented 40%, Environmental Protection Agency (EPA) represented 20%, Liberia International Shipping and Corporate Registry (LISCR) represented 10%, Liberia Maritime Authority (LiMA) represented 10%, Ministry of Transport (MoT) represented 10%, and National Fisheries and Aquaculture Authority (NaFAA) represented 10% of respondents of the questionnaires.

A similar question was asked respondents from institutions outside of Liberia. Institutions such as the Asian Institute of Maritime (AIM) is a maritime academy – and the Liberia Maritime Authority is a government agency. This scenario contradicts the fact that Liberia is the world's second-largest shipping registry and a party to the STCW Convention 78, as amended. The disproportion can be attributed to the fact that maritime in Liberia is not seen as a priority sector of government coupled with the political instability Liberia has faced for three decades. The situation, however, presents an opportunity for the government to develop relevant institutions necessary for the institutions by investing in infrastructure, human resources, and technology which require a substantial capital cost. It will take a few years to develop the capital investment needed and thus embark on long term MET projects such as establishing a MET institution around the country and modernizing the Liberia Maritime Training Institute (LMTI).

5.2.3 Training levels offered by the MET institution?

The availability of human resources – such as instructors is an essential feature in defining the levels and specializations a training institute or MET institution can deliver. As shown in Figure 2, Liberian institutions provide training across the three levels of responsibility³. For example, NaFAA, MoT, and the EPA provide basic safety training relating to the shipping and maritime industry. Such safety training is located within the sphere of technical support programs. On a scale of 5, the LMTI scored an average of 3 as the most effective and only accredited MET institution in Liberia. The LMTI, the only MET institution in Liberia, provides training for marine

³ The different levels of responsibility include – Management, Operations and Technical Support. Support, however, is offered by all MET or MET-related institutions because it refers to some of the most basic trainings.

engineers at the management and operational level, in addition to the technical support level. None of the Liberian institutions or government agencies is presently offering the management and operational level of training.

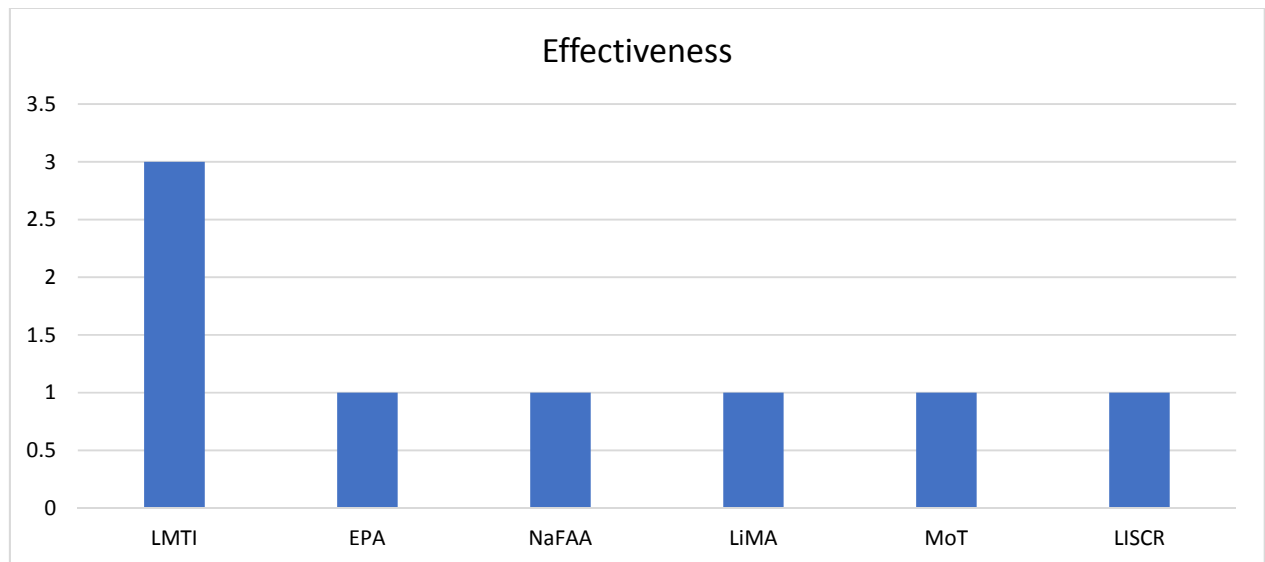


Figure 8. Effectiveness of Training in MET

Unfortunately, local universities and colleges do not specialize in the training of marine engineers – or provide MET support in any form. The prospect of an institution to successfully deliver on MET programs and support chiefly depends on the ability to expand training programs toward MET. This diversification is a strategy used to foundation years of training for the overall engineering specializations. There is currently a lack of such diversification for MET programs offered in Liberia. The lack of specialization primarily links to the shortage of instructors across the different specializations.

The data collected for this study in government agencies as well as the Liberia Maritime Training Institute (LMTI) illustrate the potential to develop MET programs in Liberia – and the opportunity to offer the three levels of responsibility – technical support, management, and operations.

5.2.4 Educational level of MET Instructors

The study used this question to investigate the qualifications of MET instructors by the STCW Convention 78, as amended. This requirement falls under Section A-1/6 of the STCW Convention.

The data collected show a relationship between the Liberia Maritime Training Institute (LMTI) and other government agencies. Due to the shortage of professional and skilled staff in the maritime sector, individuals play different roles across institutions in the maritime industry in Liberia.

Moreover, Figure 9 confirms the shortage of MET instructors MET institutions in Liberia trained and skilled in the maritime sector. The Liberia Maritime Training Institute (LMTI) – the only MET institution discussed the possibilities of organizing parallel programs that are non-maritime related. The LMTI explained that they intend to use the opportunity to hire non-MET specialists to support the development of a degree-based program along with MET instructors.

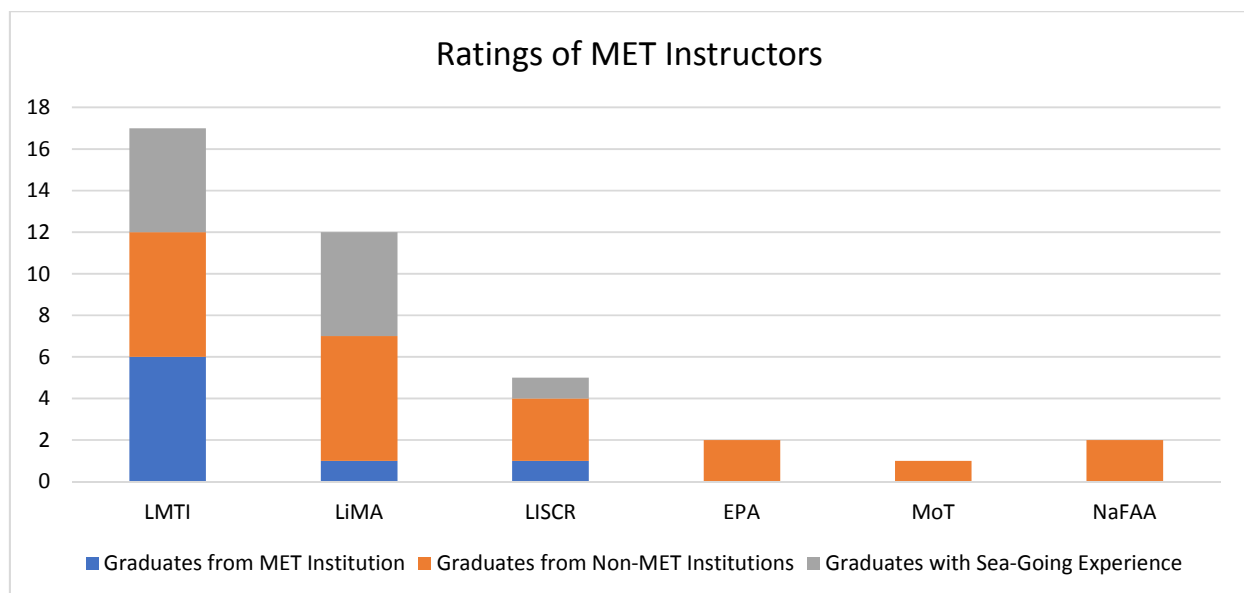


Figure 9. The educational level of MET Instructors

On the other hand, it is essential to note that MET institutions in Europe and other parts of the world – including Africa have an increased level of MET graduates and instructors. However, Liberia has a shortage of MET specialists and instructors – and has fallen short of providing the necessary support to develop the seafaring capacity of the State.

5.2.5 MET Institutions and Subjects Taught

The data collected for this study were processed from respondents working within six national institutions – one training institute and five government agencies. According to Figure 10, both the Liberia Maritime Training Institute (LMTI) and the Liberia Maritime Authority (LiMA) have six

persons with either MET training or trained at a MET institution. The Environmental Protection Agency (EPA) has two persons with MET training. Both the Liberia International Shipping and Corporate Registry (LISCR) and the National Fisheries and Aquaculture Authority (NaFAA) have one person each trained in MET.

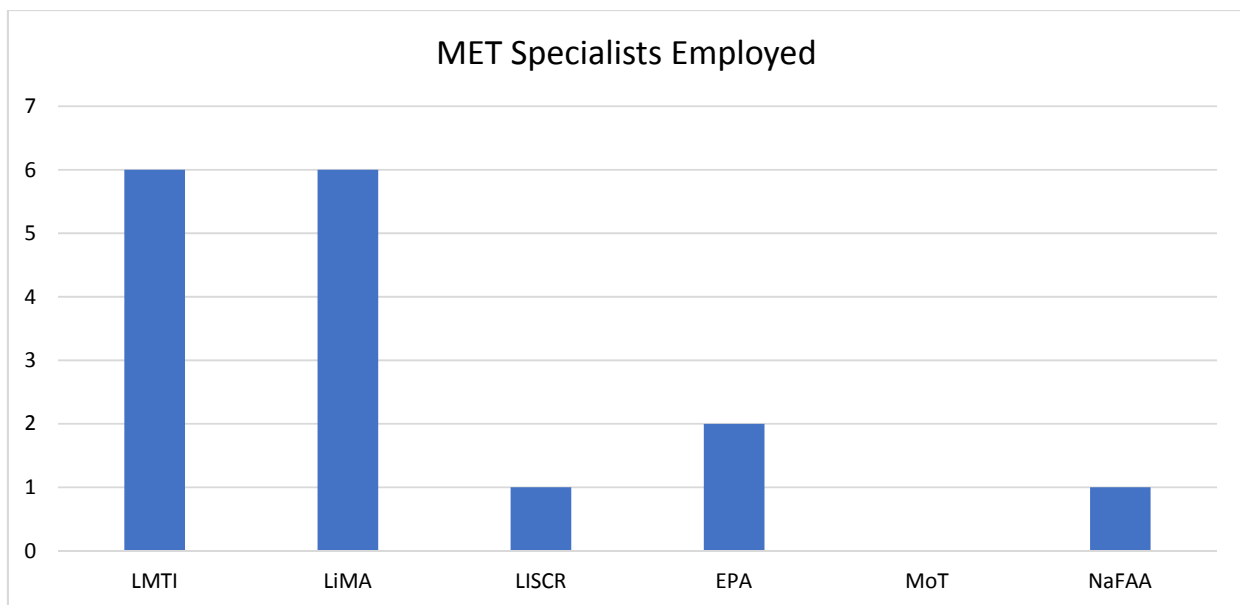


Figure 10. MET Specialists Employed

Contrary to global MET training standards, the Liberia Maritime Training Institute (LMTI) is the only institution in Liberia that provides MET training and services to the State – see Figure 10. Although individuals trained in MET do provide technical support to the LMTI, these individuals are employed by other government agencies – LiMA, EPA, LISCR, MoT, and NaFAA. This level of analysis – illustrated in Figure 5 dictates the four modes of knowledge management.

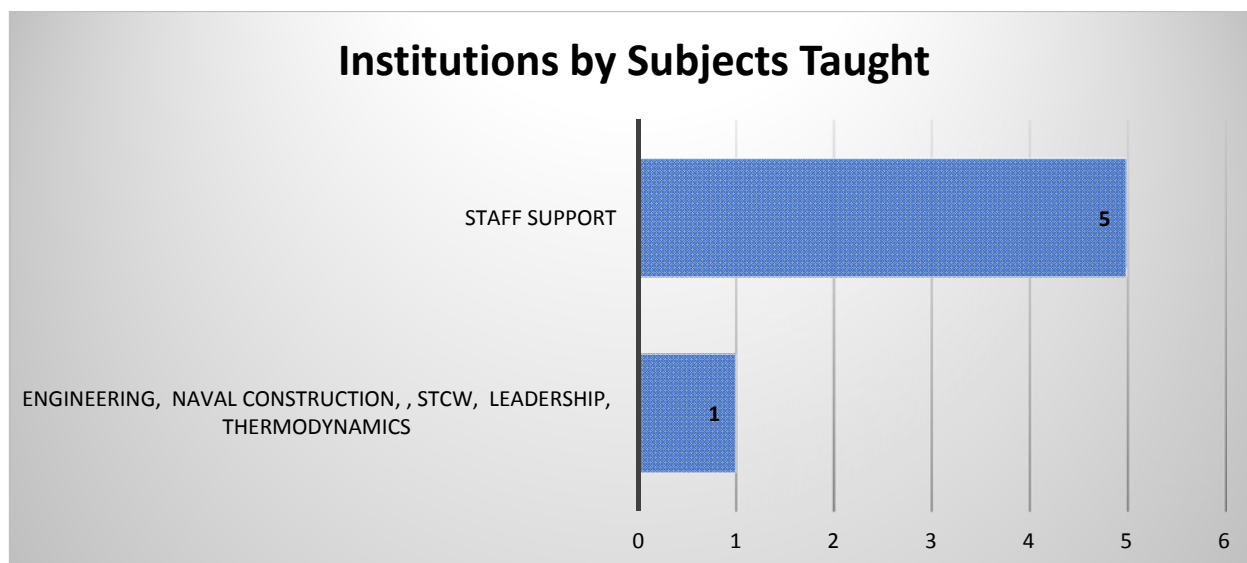


Figure 11. Institutions by Subject Taught

5.2.6 Plans for Sea Training

All MET institutions require trained and qualified instructors with the use of the appropriate technology and set of equipment to undertake the relevant sea training to achieve the mandatory competency. The analysis from Figure 12 illustrates that the Liberia Maritime Training Institute (LMTI), the Liberia International Shipping and Corporate Registry (LISCR), and the Liberia Maritime Authority (LiMA) have organized strategies to seek out agreements with shipping companies – in the form of MOU to plan for sea training in MET. As an alternative, these institutions provide the platform for students to find training opportunities individually to plan for sea training. Besides, Figure 12 illustrates a level of analysis that is related to goal-based learning – one of two theories identify by this study that could address challenges faced by the development and implementation of MET in Liberia.

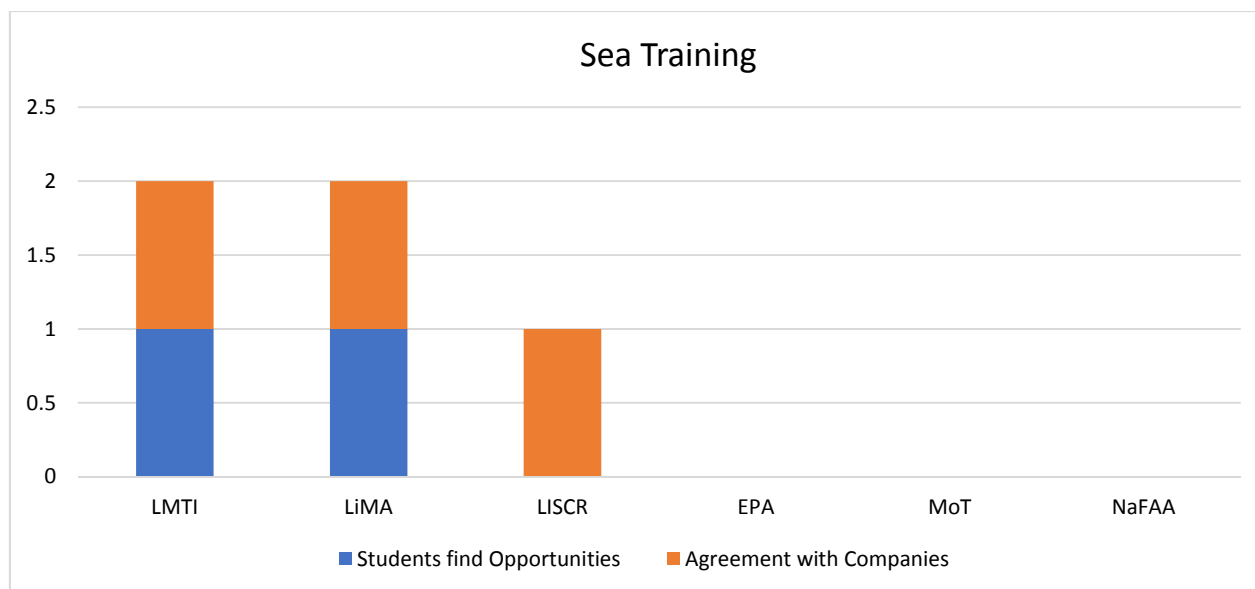


Figure 12. Sea Training Opportunities

However, other government agencies neither provide an agreement with shipping companies nor provide the platform for students to find training opportunities individually to plan for sea training. On the contrary, the government is yet to secure an agreement, on behalf of the State, with shipping companies in the form of Memorandum of Understanding (MOU). The MOU is an agreement intended to deliver on opportunities for shipping companies to provide cadet berths for MET trainees. Tactlessly, no institutions have a training vessel to facilitate training at sea.

5.2.7 Challenges for Practical Training in MET

Figure 6 illustrates how institutions – either providing training for MET programs or supplying staff to support the development and sustenance of MET in Liberia. It is essential to note that the six institutions outlined in this study – including several others, particularly those from developing countries, have challenges in training and equipment vital for practical training of seafarers. Consequently, the study trailed to gain a comprehensive understanding of the challenges the MET institution(s) in Liberia are facing in comparison to other institutions in providing practical training. Institutions in Liberia primarily signposted the lack of seagoing experience, the non-availability of laboratory and technical equipment, the availability of textbooks and publications, and lack of simulation equipment needed to provide required practical training effectively. Figure 13 further demonstrates similar features across the graph – where seagoing experience, laboratory and equipment support, texts and publications, as well as simulation appear to be the

same for all of the institutions identified for this study. The effect is due to the limited human resource capacity – an shared expertise utilized by the Liberia Maritime Training Institute (LMTI), offered by other government agencies such as the Liberia Maritime Authority (LiMA), Liberia International Shipping and Corporate Registry (LISCR), Environmental Protection Agency (EPA), National Fisheries and Aquaculture Authority (NaFAA), and the Ministry of Transport (MoT).

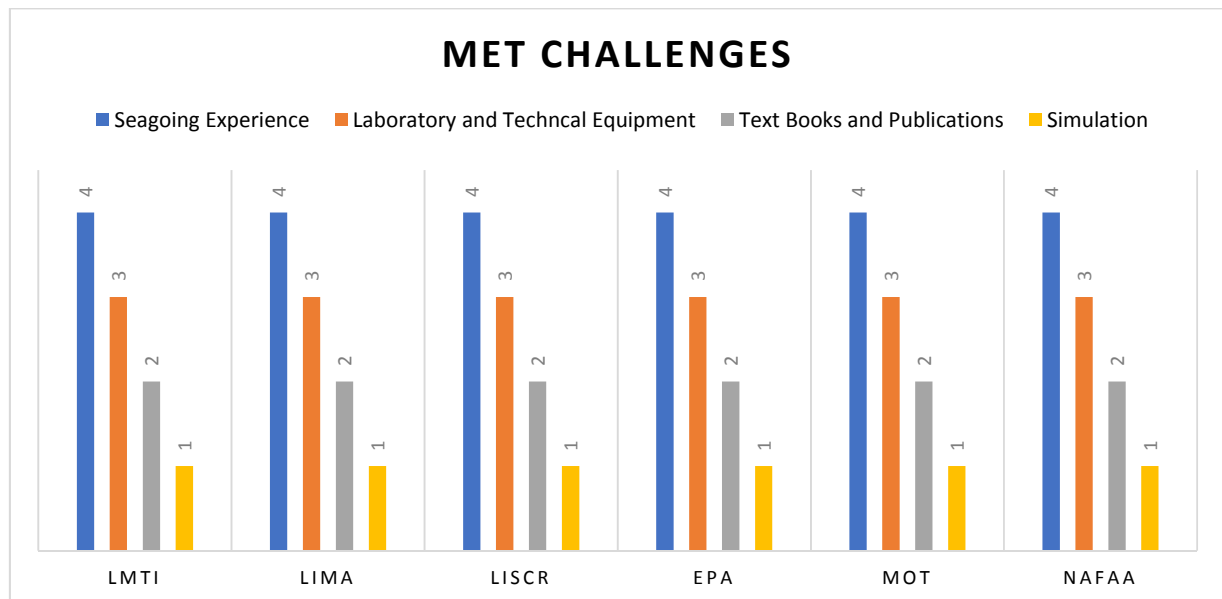


Figure 13. MET Challenges for Practical Training

Moreover, attaining seagoing training opportunities for cadets is a challenge for all or most institutions, including the shortage of qualified instructors and assessors in practical training at different levels. For example, the LMTI has a laboratory, and reasonable numbers of technical equipment but faces the challenges with the unavailability of simulators. Nevertheless, there is a need for the laboratory to be upgraded, and thus emphasizing seagoing opportunities for cadets.

5.2.8 Assessment of Practical Training in MET Institution

This analysis intends to determine how institutions offering MET training or professional services conduct practical training as well as the kind of technological resources they possess for practical training and assessment in MET. One institution in Liberia out of the six institutions representing 16.7% has one computer-based training center, appreciable training equipment, and offer classroom lectures and onboard training. From the analysis provided by Figure 14, 66.8% offers

onboard training, 33.4% provides training equipment, 16.7% provide classroom lectures, 16.7% provides computer-based training, and 16.7% provides engine room simulator training.

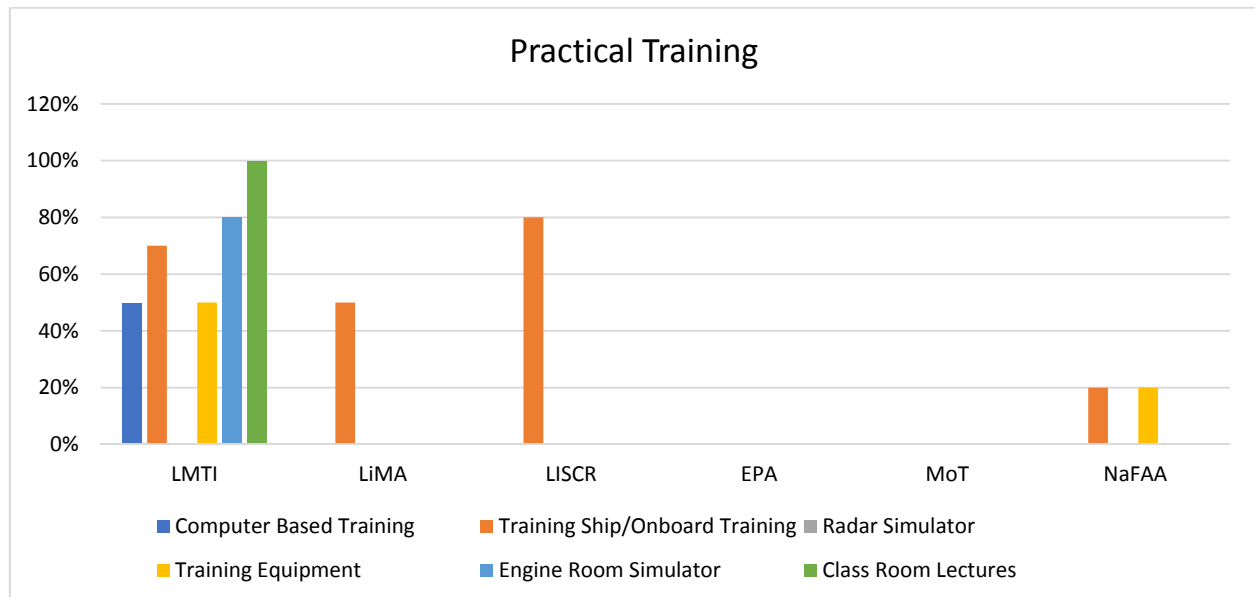


Figure 14. Practical Training in MET

However, five other institutions – or government agencies representing 83.3% of the institutions sampled are not officially ‘MET Institutions,’ but they do provide other relevant support to the development of MET such as seconding staff to lecture at the LMTI. The data illustrates that there is a recognition of the importance of technological resources for practical training in MET development in Liberia.

5.2.9 Procuring Equipment for Practical Training

The study has discussed different methods of practical training and challenges faced by MET institutions in Liberia. The study further seeks to understand how these institutions procure get access to equipment for practical training exercises. Figure 9 illustrates how MET institutions and MET-affiliate institutions, LMTI, LiMA, LISCRC, NaFAA, EPA, and MoT obtain equipment for practical training to develop and sustain MET programs in Liberia – and the potential to receive such support from the government or relevant stakeholders.

The LMTI, LiMA, LISCRC, EPA, and NaFAA – all in one way or the other receive grants from the government to facilitate the purchase equipment to support practical training. On the other hand,

50% of the institutions sampled – LMTI, LiMA, and LISCR possess, to an extent, institutional finance to support practical training through the purchase of equipment. Contrastingly, all six institutions have, in a way or the other partner with each other or with relevant stakeholders in the maritime domain.

However, the shortage of practical training equipment, including simulation equipment in Liberia can be attributed to the lack of adequate funding – or funding mechanism develop MET programs in institutions. It is, however, essential to accrue resources to support practical training development for MET institutions.

5.2.10 Conduct of Quality Standards Audit

Section A-1/8 of the STCW Convention 78, as amended makes provision of quality standards for MET training and operations. Based on Section A-1/8, the study probes how quality audits are carried out. It was observed that all institutions understudy employ internal audits. However, LMTI and NaFAA are assessed or audited by the national maritime authority, Ministry of Education, the Institute of Higher Education – and of course undergo internal audits.

It is important to note that the Ministry of Education has oversight responsibilities over LMTI and NaFAA because of the audit support it provides it ensure that MET education and fisheries science are incorporated into the national curriculum and meet best practices. This analysis, however, confirms the relevance of quality standards in developing MET programs and institutions, with a significant focus on Liberia and developing countries.

5.2. 11 Challenges facing to Implement STCW Convention 78, as Amended

In this chapter, the study has identified challenges and assessment of practical training – and equipment to develop MET programs and institutions in Liberia. However, Figure 17 focuses on analyzing the challenges institutions face to implement the STCW Convention 78, as amended. Lack of funding mechanisms, simulators, training infrastructures, political will, and MET specialists are all among the challenges highlighted during the study. According to the data collected, political will stood out as the main driver for the development of MET programs and institutions in Liberia. Respondents argued that the presence of political will triggers the priority and interests of the

government in MET development – and thus subsequently eliminate the several challenges identified in this study.

5.3 Analysing the Interview Data

The interview guide is a usual means to support a research study to conduct an effective semi-structured interview. The interview guide was used to explore the challenges of both human and technological resources in MET institutions – to analyze past and emerging developments including the impacts of the STCW Convention 78, as amended on the development and sustenance of MET in Liberia.

Respondents from one maritime training institution – the Liberia Maritime Training Institute (LMTI), and five other government agencies including the Liberia Maritime Authority (LiMA), the Liberia International Shipping and Corporate Registry (LISCR), Environmental Protection Agency (EPA), Mombasa Technical University in Kenya, Asian Institute of Maritime (AIM) in the Philippines, and the National Fisheries and Aquaculture Authority (NaFAA) in Liberia. There were five questions asked, and responses are summarized below.

5.3.1 What is the minimum qualification of the teaching staff of a MET institution?

Respondents during the study under this topic indicated that a Bachelors should be the essential requirement for recruiting instructors and assessors in MET institutions to further develop MET programs in Liberia – and resounding an effective management system. However, most respondents insisted that the minimum qualification for teaching staff depends on the course being taught. These courses can be categorized into two. The courses with regards to the minimum competences required to be licensed or certified by the STCW Convention and Code and the other relevant courses that form the foundation for teaching the competencies. This structure is clear under the Regulation I/6 as laid out in Section A-I/6 and guided by B-I/6, where the appropriateness of an instructor is mentioned. Thus for the core competencies holding a certificate of competence with considerable sea experience should form the minimum qualifications. For the other supporting and complementary courses, the instructor should be adequately and specialist in the course material. For example, Marine Engineering includes components of mechanical, electrical, and electronic engineering. For workshop training on fabrication and welding a qualified person and certificated in welding is only suitable for that

training and cannot teach in general shipboard competencies.

5.3.2 Which equipment is suitable for practical and simulation training of seafarers to improve maritime education and training in Liberia?

The respondents provided extensive responses towards the general understanding that each MET institution must have at least a bridge simulator, engine room simulator, RADAR, and computer-based training. Through the interview, it was discovered that some institutions which were not accessible for this study have different kinds of simulation equipment. Simulators, however, are required for mandatory courses by the STCW Convention

Also, respondents indicated that the suitability of practical and simulation training is determinant on curriculum delivery. For practical training workshops, availability of laboratories and simulators are essential. It is, however, essential that the choice of simulators is based on realistic achievement of the competencies. The following are important:

- Engineering Workshops: Mechanical, Electrical, Electronic, Ship engine room equipment, and Main Engine;
- Seamanship Workshop: Deck Machinery, Anchors and accessories, mooring lines and paint shop;
- Meteorology Lab;
- Navigation Training room;
- Engine room simulators; and
- Navigation simulators.

5.3.3 Can simulators be an alternative to sea training in your view?

According to respondents, simulators cannot entirely be used for sea training. The affective domain Learning is barely realized through simulation. Although there has been a tremendous effort, it should also be realized that the composition of the onboard environment cannot be entirely simulated. However, this does not undermine the importance of the simulator as a useful tool for training in addition to the ability to repeat scenarios.

All respondents discoursed that it is expensive to mount and sustain simulators. Respondents further opined that simulators provide valuable training tools that allow students to train in a safe

and conducive environment. Also, respondents accepted that simulation provides the platform to training seafarers in a realistic environment through scenario-based training, which supports augmentation of skills, at the same time, allowing a safe environment for assessment. These responses further endorse the importance of the technological capacity for MET institutions in the form of equipment for practical training and simulators.

5.3.4 What duration of sea training can be substituted with simulator training?

Some respondents opined that sea training should not be reduced further or replaced with simulator training. The reason is to allow the practical aspect of sea training to prepare students further for their work at sea in real conditions.

Also, respondents put forward the following questions as an essential inquiry to the 'sea time remission' debate:

1. Establishment minimum requirements as a reference for determining the adequacy of sea-time.
2. The knowledge and skills that can be adequately realized through simulation.
3. Scientific research or documented empirical evidence to validate the scope of sea-time remission.

5.3.5 What challenges are MET institutions facing in the implementation of STCW Manila amendments?

Respondents indicated that institutions are faced with a different set of challenges as most MET institutions aim to Manila amendments. From responses received, it is clear that Liberia and other developing countries, including Kenya and the Philippines, face challenges in recruiting suitably qualified MET instructors and assessors. It was further evident from respondents that seafarers are not interested in leaving their seagoing occupations to revert to teaching jobs in a land-based environment.

Besides, responses from the Mombasa Technical University, Kenya and the Asian Institute of Maritime (AIM) corroborated that practical training delivers on the competence essential for seafarers by the STCW Convention 78, as amended. It was observed that such a challenge was most prevalent in developing countries, including Liberia.

Respondents further identified that the most significant shortcoming is the availability and use of simulators. The analysis recognized that technological challenge is a significant concern not only for MET in Liberia but also a challenge in most developing countries. Also, respondents indicated that simulation offers the opportunity for students to practice several scenarios and develop the right attitude and capability to respond to emergency conditions.

Moreover, respondents identified key challenges facing the implementation of the Manila amendments, which can be categorized into four segments:

- The national legal framework including legislation giving effect to localization of the amendments and political trends;
- Infrastructure and material resources for the implementation of MET;
- The human capital to implement MET; and
- The industry and stakeholder collaboration.

CHAPTER SIX

6. ANALYZING LIBERIAN MET CHALLENGES

6.1 Introduction

The discussion chapter attempts to answer the research questions of this study through a comprehensive discussion which produces the literature review as well as findings and data analysis. The discussion will lastly conclude with propositions on how the challenges recognized in chapter five can be alleviated – consistent with the theories of knowledge management and goal-based management, as described in chapter three.

6.2 What is the current state of MET implementation and development in Liberia?

The literature review of this study presents the roadmap towards the implementation of MET in Liberia beginning 2016 when the Government of Liberia and the Liberia International Shipping and Corporate Registry (LISCR) signed an agreement for the revitalization and rehabilitation of the Liberia International Shipping and Corporate Registry (LISCR). Also, the theories on goal-based management and knowledge management were adapted to guide the structural approach of the study. Liberia has been a global leader in the shipping industry; thus, acquiring the IMO ‘whitelist’ standing to offer MET training and develop MET programs in Liberia – for Liberia and the West African region, is a big step to the development of MET institutions. A group of competent individuals developed the White List at the IMO, through criteria as the kind of system of licensing an administration has, training center oversight, the process of certificate revalidation, flag state control, and port state control.

For a State to be declared as a ‘White List’ nation, it must be fully compliant with the STCW 95, Convention and Codes. The requirements for compliance involves the following:

- The country must provide detailed information to the IMO regarding administrative procedures endorsed to guarantee compliance, education and training courses, and best practices for certification.
- The panel of ‘competent persons,’ who are nominated by Parties of the STCW, reviews available information. Those persons report their findings to the Secretary-General of the

IMO – who reports to the Maritime Safety Committee (MSC) on the Parties that comply. The MSC, however, produces a list of all Parties in compliance, called the White List.

The literature reviewed for this study suggests that the Government of Liberia through the Liberia International Shipping Registry (LISCR) continues to support maritime functions and development in Liberia. The commitment of the Government of Liberia is demonstrated through the overwhelming support LISCR receives from the Government of Liberia to manage shipping fleets flagged to Liberia as well as the revitalization and rehabilitation of the Liberia Maritime Training Institute (LMTI) to develop the capacities of Liberia seafarers for the international job market. Despite several efforts to promote maritime in Liberia and the recently established MET programs at the Liberia Maritime Training Institute (LMTI), chapter five on data analysis confirms that MET in Liberia is still at its development stages. This interpretation is based on the data analysis, which shows that there is a lack of infrastructure and equipment, simulations, qualified instructors and assessors, and political will.

The Liberia Maritime Training Institute (LMTI), for example, offers the management – a level of responsibility as a strategy to develop MET programs in Liberia. The data collected and analysed for the study indicates that the LMTI, as well as other government agencies, offers management level of responsibility.

Moreover, the analysis further dictates that in order to develop fully MET programs and institutions in Liberia, there will need to be adequate funding and the political will to govern the process in the medium and longer-term.

6.3 What are the challenges facing the MET implementation process in Liberia?

In addition to human and technological challenges, the study examines other constraints facing the implementation of MET in Liberia. The general perception of the Liberian public view the seafaring profession that “seafaring can be acquired by apprenticeship, and that there is no need for academic training or technical support skills required through an institution.”

The misunderstandings have the propensity to complex human resource challenges if not addressed, and could potentially affect enrolment levels of students interested in studying MET

in Liberia. The recurring effect of this situation would be the lack of public interest and seafarers as well as the lack of instructors and assessors for MET training and programs.

6.4 How human and technological resource challenges influence the MET implementation and development process?

The analysis of this study demonstrates that the STCW Convention 78, as amended, is a critical requirement to address human and technological resources challenges that MET face in Liberia. The challenges were revealed through the literature review and data analysis. The analysis also focused on the training “T” of the STCW Convention, consequently reconnoitering Section A-I/6, A-I/8, and A-I/12 of the STCW Convention. Moreover, the analysis confirms that the shortage of MET instructors has become an alarming situation since a non-specialized instructor⁴.

6.4.1 The Shortage of Human Resource in MET

The literature reviewed for this study took into consideration the global shortage of seafarers. The global shortage of seafarers is confirmed by the Drewry Report (2018), which discusses the training and development of seafarers worldwide. Contrariwise, the report illustrates the shortage of seafarers in Europe in stark contrast to an increase in the supply of seafarers across the Indian Ocean region.

The current and emerging status of human resources in the maritime sector is alarming and attracts relevant partners in the maritime domain globally. According to Toz and Koseoglu (2012), the shortage of qualified personnel could be detrimental to safety standards in shipping. The shortage of global officer supply in the shipping industry has driven the Liberian strategy – the Government of Liberia and the Liberia International Shipping and Corporate Registry (LISCR) to revisit the development of the Liberia Maritime Training Institute (LMTI) in 2016. While this is a well-thought strategy, there is an acute shortage of instructors and assessors to provide the essential support for the development of MET institutions in Liberia. Although Liberian seafarers are still training at the Regional Maritime University (RMU), the literature reviewed for the study describes the shortage of instructors in Liberia as a result of a knowledge gap in the maritime sector – and the lack of political will.

⁴ Appendix C of the ISF guidelines on mandatory requirements concerning qualifications of instructors, supervisors and assessors (ISF 2010).

However, the analysis further recognizes the need to acquire qualified instructors for Liberian MET institutions. The LMTI is seriously considering to develop the capacities of instructors through training and recruitment for specialized marine engineering courses.

Besides, the analysis showed inadequate numbers of MET teachers, particularly in Liberia. This evidence suggests the potential for Liberian institutions seeking cooperative agreements with the regional and global institutions with adequate numbers of instructors to develop and improve the human resource capacity and maintain the requirements of STCW Convention 78, as amended.

The literature reviewed evaluated the option of contracting expatriate MET instructors. It was established that some developing countries had explored this possibility in the past, but it was found unsustainable due to substantial financial implications including, demand for high salaries and allowances as elucidated by Menon (1986). An attractive offer for foreign MET instructors can be extended to ensure Liberian MET instructors can understudy the experienced instructors and assessors to facilitate the transfer of knowledge.

Collaborative partnerships could be a useful tool to develop human resource capacity for MET development in Liberia. For example, collaborative partnerships with relevant institutions in the maritime domain could be used to share human resources in the specialized courses. Collaborative partnerships can be inter-institutional intended to build institutional capacities, and develop a national capability for MET in Liberia. Cooperation can further be developed regionally to build a regional maritime knowledge base.

6.4.2 Technological Challenge

The analysis of technological challenges was assessed concerning STCW Convention 78, as amended and its importance on the competence of seafarers. The STCW hierarchy of Competence provides strategies for competency, knowledge, and understanding, approaches for demonstrating competence, and criteria for assessing competence.

Simulators have been recommended as tools capable of reducing human error (ISF, 2010; Hernqvist, 2012), in addition to providing a safe environment for training and assessment. The ISF guidelines endorse the use of simulators in MRM for training deck and engine room officers to develop soft skills to mitigate human element related accidents. The retitling of STW Sub-

Committee to Human Element, Training, and Watchkeeping sub-committee recognizes the importance of matters concerning the role of the human element in the maritime industry (IMO, 2013).

The necessity to build capacity in practical training for MET development, data attained from LMTI shows that there is a discussion between the Government of Liberia and the Liberia International Shipping and Corporate Registry (LISCR) to augment the political will further. The development of MET by increasing the number of qualified instructors, the availability of infrastructures and equipment will share the technological resources and provide practical training for MET students in a cost-effective manner. This development of MET can be associated with the Netherlands where MET institutions send their students for simulation training to a simulation center in Terschelling.

Furthermore, the data analysis recognized that the MET institution identified in Liberia identified the need to upgrade equipment for practical training. The situation is similar to institutions in Liberia and the Philippines.

With the development of multi-media and communication technologies, the concept of e-learning can be employed to improve the technological challenges in training of seafarers in Liberia. The use of computer applications provides considerable potential in the development of MET in Liberia. These resources can be obtained from recognized institutions or online to supplement computer-based learning. This understanding is based on the literature review, which indicates that computer-based training is a cost-effective function which serves as an alternative to providing practical training, a learning tool also applied by shipping companies for seafarers on-board ship (Fisher and Muirhead 2005, p151-159).

Moreover, the analysis illustrates the appreciation of simulation training and an increasing trend towards the reduction of sea time for simulator time, perhaps to reduce training time because of the scarcity of qualified officers. Nevertheless, the STCW Convention 78, as amended, emphasizes the results of training and requires minimum time for seagoing service.

Some MET institutions carry out their training on training ships, but still, seek cadet berths on-board merchant ships. Despite the high cost of deploying a training ship for training purposes, academics argue that the experience on-board a training ship does not provide a similar

experience as in a merchant ship. However, Demirel and Ziarati (2012) posited that training ships provide better training than a land-based bridge and engine-room simulation.

The analysis for this study further indicates, LMTI cadets studying in Liberia have secured cadet berths with an Italian Company through the Liberia International Shipping registry (LISCR) by a collaborative partnership. Nevertheless, as the projected number of MET students studying in Liberia is expected to rise, a single shipping company cannot accommodate all the cadets from Liberian MET institutions in the medium and longer-term. Therefore, there is a need to adopt strategies to provide cadet berths for Liberian students. Nevertheless, the Government of Liberia can provide other incentives to shipping companies and require them to market and advertise their shipping services in Liberia.

6.4.3 Quality Standards

The analysis for this study shows that there are traces of quality standards in the MET system in Liberia. However, the literature reviewed on the STCW Convention, Section A-I/8 specifies that quality standards in MET are more complex, as the requirements of the STCW Convention guide them. Moreover, quality standards should be custom-made to suit specific programs, hence the difficulty in interpreting the relationship between the objectives and the actual achievement.

From the knowledge acquired throughout this study, quality standards include quality of human resources such as instructors, academic programs, approval of new courses, and assessment processes. MET institutions cannot meet the required quality standards without competent human resources and adequate technological resources. Besides, quality standards should be more perceptible and transparent to the community that MET institutions serve

CHAPTER SEVEN

7. CONCLUSION

This dissertation is a first study of the development of MET in Liberia – and exploring current and emerging contexts by exploring human and technological resources challenges facing the development and implementation of MET in Liberia. The outcome of the literature review and the data analysis establishes that there is a notable shortfall in the number of qualified officers globally. It is also evident that there is a need for quality training while seafarers have a vital role in safety, prevention of marine accidents, as well as the effective operation of ships.

Furthermore, the shortage of MET trainers and assessors in Liberia is aggravated by a knowledge gap which resulted from the lack of training of seafarers on the national platform. In order to improve the MET training and institutions in Liberia, the gap needs to be filled through the provision of quality education and training of seafarers in the newly established MET institutions.

Similarly, the STCW Convention 78, as amended places importance on competency and proficiency. It is essential for MET institutions to provide effective simulation, computer-based training, and well-equipped laboratories and workshops to enhance practical training. This challenge can be addressed through collaborative partnerships by sharing of resources such as human and technological resources among MET institutions, employing e-learning, and integrated learning tools. However, efforts to lobby and influence the Government of Liberia of the relevance of setting up a national maritime simulation center in addition to the Liberia Maritime Training Institute (LMTI) to support the development and implementation MET institutions.

Moreover, to develop sustainable MET programs and institutions – and to address the challenges of human and technological resources, the LMTI should forge a cooperative working relationship with the shipping companies and affiliated maritime institutions – in the region and globally. The collaborative partnership will keep them abreast with industrial developments and demands, in addition to networking with the experts in these institutions to uphold continuous growth. Meanwhile, establishing collaborative partnerships with shipping companies will provide an opportunity to negotiate cadet berths for practical training. Also, the study reveals that challenges associated with technological resources exist not only in Liberian institutions but also in institutions abroad, and primarily in developing countries. The STCW Convention 78, as

amended, however, requires compliance with training standards which include the competence of MET instructors and assessors and appropriate sea training.

The assessment of the contemporary MET development and implementation in Liberia revealed the vital need for capacity building in terms of human and technological resources for sustainable implementation and development of MET. The dissertation has proposed various responses to address and mitigate the challenges facing MET institutions in Liberia. Though the government's support in the form of infrastructure, finance, and a legal mechanism is critical at this stage, MET development and implementation demands consistent communication and collaboration between stakeholders, and shared understanding.

In conclusion, the research proposes the creation of medium and long-term platforms for relevant initiatives to guarantee that the development and implementation of MET in Liberia take place consistent with the informed political and industrial decisions. The data analysis and findings from this study provide a framework for further research on MET in Liberia.

This sub-section highlights some limitation of the research study. A critical shortcoming of the study was due to performing the research from afar. The study-focus was Liberia – where most of the respondents selected for the study were located. Administering the questionnaires from Sweden posed a challenge. This gap, to an extent, affected the quality of the data collection process.

As described by the methodology chapter, the study adopted an interview guide and questionnaire to collect data relevant for the information gathering. This process was carried out via telephone conversation and employing email. The means of phone and email, however, provided the right platform to gather the relevant information relating to the objectives of the study – despite the intermittent internet connectivity between Sweden and Liberia.

The challenges cited above represent the limitation of this research study. However, the output of this research study should be disseminated adequately to ensure proper policy circulation on the national level. The author of this research strongly feels that the result of the study is an opportunity to improve the management and development of MET institutions and planning in Liberia – including human and technological resources consistent with the STCW Convention 1978, as amended.

However, the research study will provide the platform and open a window for renewed opportunity for further research in the maritime sector relating to MET development and implementation. There is a potential for new challenges in the MET sector – during the process of implementing results of this study, for example. The improvement of MET institutions expanded on throughout the research will need to be reviewed and modified over time due to the advancement of technology. Future research, however, should also place focus on the development of the shipping industry overall – considering human factors and international shipping. Improving MET in Liberia, for example, due to the advance of shipping and technology requires the necessary legal environment and regulatory framework.

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APPENDIX A: Research Protocol Form



WMU Research Ethics Committee Protocol

Name of principal researcher:	Miatta Sonie SHERIF
Name(s) of any co-researcher(s):	None
If applicable, for which degree is each researcher registered?	MSc. In Maritime Education and Training
Name of supervisor, if any:	Profesor Momoko Kitada
Title of project:	The Development and Maintenance of Maritime Education and Training (MET) in Liberia: Historical Analysis
Is the research funded externally?	No
If so, by which agency?	None
Where will the research be carried out?	Liberia
How will the participants be recruited?	The questionnaire will be sent out electronically to the participants and the interview will be done through telephone or skype conversation and recorded on a recorder. This will be done by the researcher
How many participants will take part?	10-15 participants
Will they be paid?	No
If so, please supply details:	None
How will the research data be collected (by interview, by questionnaires, etc.)?	Through semi-structured interview and questionnaires
How will the research data be stored?	The records of this study will be kept strictly confidential. Research records including digitally recorded interviews will be kept on a hard drive and in a locked file by the researcher.
How and when will the research data be disposed of?	The research data will be erased upon completion of my Masters degree in Maritime Affairs on the November 3, 2019
Is a risk assessment necessary? If so, please attach	No

Signature(s) of Researcher(s): *msherif*

Date: *24/04/19*

Signature of Supervisor: *北田 雅子*

Date: *24/04/19*

Please attach:

- A copy of the research proposal
- A copy of any risk assessment
- 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

APPENDIX B:

Consent to Participate in an Interview

World Maritime University – Malmö, Sweden

Title of Study: The Development and Maintenance of Maritime Education and Training (MET) in Liberia: Historical Analysis

Researcher Name: Miatta Sonie Sherif

Introduction

- ❖ You are being asked to participate in a research study that seeks to evaluate the development and maintenance of maritime education and training in Liberia.
- ❖ You were selected as a possible participant because of the role you play in the maritime sector in Liberia.
- ❖ I ask that you read this form and ask any questions that you may have before agreeing to be in the study.

Purpose of Study

- ❖ The purpose of this study is to explore the challenges faced by MET in Liberia particularly the Liberia Maritime Training Institute (LMTI) – the only MET institution in Liberia.

Description of the Study Procedures

- ❖ If you agree to participate in this study, you will be asked to do the following things: confirm your availability for one-on-one interview; share knowledge and new insights on the status of maritime education and training in Liberia.
- ❖ The duration of the interview will range from 30-45 minutes.
- ❖ The optimal number of respondents identified for the interview will range from 10 to 15 maritime educators and practitioners.

Risks/Discomforts of Being in this Study

- ❖ There are no reasonably foreseeable or unexpected risks associated with this study. However, it is your decision to participate in the study or even withdraw at any time.

Benefits of Being in the Study

- ❖ The benefits of participation in the study provide a longer-term solution to improving maritime education and training in Liberia.
- ❖ Individual insights could provide policy suggestions for the improvement of maritime training institutions.

Confidentiality

- ❖ This study is anonymous.
The records of this study will be kept strictly confidential. Research records including digitally recorded **interviews** will be kept on a hard drive and in a locked file by the researcher.
- ❖ I will not include any information in any report I may publish that would make it possible to identify you.

Right to Refuse or Withdraw

- ❖ The decision to participate in this study is entirely up to you. You may refuse to take part in the study at any time without affecting your relationship with the student conducting this study or World Maritime University. You have the right not to answer any single question, as well as to withdraw completely from the interview at any point during the process; additionally, you have the right to request that the student not to use any material presented during the interview.

Consent

- ❖ Your signature below is an indication that you have decided to volunteer as a research participant for this study, and that you have read and understood the information provided above.

Name: _____

Signature: _____ Date: _____

APPENDIX C: QUESTIONNAIRE FOR MET INSTITUTIONS

I am studying MSc in Maritime Affairs at the World Maritime University, Malmö, Sweden – and specializes in Maritime Education and Training. I am undertaking a research on “The Development and Maintenance of Maritime Education and Training in Liberia: a historical analysis” and would like you to answer a few questions to provide your valuable insights to my research study. The information provided for this questionnaire will be used entirely for academic purposes.

I, _____, agree to participate in this research study.

1. Name of Institution

2. Classification of Institution

Check only one box

☐ University

☐ College

☐ Training Institute

☐ Academy

☐ Other: _____

3. How long have you been offering MET courses?

Check only one box

☐ 1 year – or less

☐ 2 – 3 years

☐ 4 years – or more

4. How many teachers employed by your institution that are MET specialists

5. What subjects do they teach?

6. How many teachers do you have in the following categories?

Graduates from MET Institutions _____

Graduate from non-maritime background _____

Graduate with sea-going experience _____

Other: _____

7. What technological challenges has influenced the development of Maritime Education and Training (MET) in Liberia?

8. How is practical training and assessment undertaken within your institution?

Check one or more options which apply

- ☐ Computer Based Training (CBT)
- ☐ Training Ship/Onboard Training
- ☐ RADAR Simulator
- ☐ Bridge Simulator
- ☐ Engine Room Simulator
- ☐ Other: _____

9. How do you procure equipment for practical training?

Check one or more options which apply

- ☐ Institutional Finance
- ☐ Government Grants
- ☐ Partnership with other Institutions
- ☐ Other: _____

10. What plans do you have for sea training in MET?

Check one or more options which apply

- ☐ Students individually find training opportunities
- ☐ Agreement with Shipping Companies (MOU)
- ☐ Institution's training vessel
- ☐ Other: _____

11. Are you facing challenges in offering practical training in MET in accordance with the STCW Convention 1978, as amended?

Check only one box

- ☐ Yes
- ☐ No

12. If yes, kindly state the challenges you are facing.

13. Who conducts quality standards audit at your institution?

Check only one box

- ☐ National Maritime Authority
- ☐ Ministry of Education
- ☐ Classification Society e.g. Det Norske Veritas (DNV)
- ☐ Other: _____

14. What other challenges are you facing to implement the STCW Convention 1978, as amended?

APPENDIX D: INTERVIEW GUIDE

I am studying MSc in Maritime Affairs at the World Maritime University, Malmö Sweden – and specializes in Maritime Education and Training. I am undertaking research on “The Development and Maintenance of Maritime Education and Training in Liberia: a historical analysis” and would like you to answer a few questions to provide your valuable insights to my research study. The information provided for this questionnaire will be used entirely for academic purposes.

- 1. What is the minimum qualification expected of the teaching staff of a MET institution?**
- 2. What equipment is suitable for practical and simulation training of seafarers to improve maritime education and training in Liberia?**
- 3. Can simulators be an alternative to sea training in your view?**
- 4. If yes, what duration of sea training can be substituted with simulator training?**
- 5. What challenges are MET institutions facing in the implementation of STCW Manila amendments?**