

# **Competency of Merchant Ship Officers in the Global Shipping Labour Market: A Study of the 'Knowing-Doing' Gap**

**Shahriar Mazhari**

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# Dedication

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*This PhD is dedicated to my dearest mother, Shokat Mazhari, to whom I wish a long and healthy life. I also dedicate it to the loving memory of my father, Reza Mazhari ...*

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# Abstract

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Shipping is one of the most globalised industries and is central to the world economy. It is estimated that over 50,000 ships (ICS 2017), manned by over 1.2 million seafarers, carry about 90 percent of world trade (ILO 2017). The seagoing workforce needed to operate these ships are drawn from the pool of the global shipping labour market. The safe and efficient operation of ships depends on the competence of the merchant ship officers who need to undergo diverse training in order to obtain the necessary knowledge and skills to perform shipboard tasks. In order to ensure the safe operation of ships and to harmonise the maritime education and training of the seafarers globally, the International Maritime Organisation (IMO) introduced the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), which stipulates the minimum standard of competence prescribed for the seafarers.

Although the STCW Convention set out to standardise seafarers' education and training, there is evidence that indicates the Convention has not been uniformly implemented and subsequently seafarers are not being uniformly trained and certified across countries. Furthermore, there is also evidence that suggests the stakeholders in the industry, particularly ship owners and ship operators, perceive a gap between the training being provided to officers and the actual skills the officers need to perform their shipboard duties. Although the voice of seafarers is largely missing in the literature, there is anecdotal evidence that indicates this perception is also shared by the officers themselves. Hence, this research examines the perceived 'gap' in the skills and competency of merchant ship officers, based on a detailed investigation of key industry stakeholders. The research also examines the nature of the skills and competency gap and the underlying reasons behind the emergence of such a gap.

The study adopts a qualitative research design to conduct the investigation in which a total of 61 informants, including ship owners, officers and trainers, across five countries, are interviewed. In addition, a documentary analysis is undertaken that includes policy documents, the STCW Convention, shipping companies' training procedures and training institutes' curricula, to complement the data from the semi-structured interviews. As a result of the STCW Convention undergoing a major revision during the course of the investigation, further interviews are conducted to examine whether the provisions of the revised Convention address the perceived skills and competency gap.

The empirical study of stakeholder perceptions, along with documentary analysis of the industry's literature, reveals that the skills and competency gap of the merchant ship officers in the global labour market is indeed a prominent issue that needs to be addressed. Through applying relevant learning theories to the research data, the competency gap is categorised into a gap in theory, or the 'knowing' gap, and a gap in practice, or the 'doing' gap. The findings show that while there is a 'knowing' gap in the education of the officers, the gap in 'doing' or the practical skills of the merchant ship officers is more salient.

The underlying reasons for such a gap are found to be largely rooted in two major phenomena. One pertains to the globalisation of shipping that led to practices such as flagging out, the emergence of a global labour market for seafarers and the shifting of maritime education and training from Traditional Maritime Nations (TMNs) to newly emerging labour-supplying nations with varying socio-economic contexts. Findings include inconsistencies in implementation of the training standards across different countries, declining commitment of the shipping companies towards the training of the workforce, as well as shortcomings to the training institutions' resources and practices.

The second phenomenon relates to advances in technology and equipment, which have led to a reduction in the number of crew and also caused significant changes to the nature of the work on board, leading to a requirement for new skills and also affecting the process of learning. In other words, advances in technology and equipment on board introduce limitations to the traditional apprenticeship model of training as these new technologies call for a more cognitive approach to the learning process. This thesis concludes by recommending measures through which the gap can be addressed.

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# List of Abbreviations

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AIS .....	Automatic Identification System
ARPA .....	Automatic Radar Plotting Aids
BIMCO.....	Baltic and International Maritime Council
BSA.....	British Sociological Association
CAQDAS .....	Computer Assisted Qualitative Data Analysis
CBT.....	Competency Based Training
CoC .....	Certificate of Competency
COC .....	Crew of Convenience
DEEWR.....	Department of Education, Employment and Workplace Relations
EASME .....	Executive Agency for Small and Medium-sized Enterprises
ECDIS .....	Electronic Chart Display and Information System
EMSA.....	European Maritime Safety Agency
ETO.....	Electro-Technical Officer
FOC.....	Flag of Convenience
GPS .....	Global Positioning System
GT .....	Gross Tonnage
HELM .....	Human Element, Leadership and Management
ICS .....	International Chamber of Shipping
ICT .....	Internet Information and Communication Technology
ILO .....	International Labour Organisation
IMCO .....	Inter-governmental Maritime Organisation
IMO.....	International Maritime Organisation
INTERTANKO .....	International Association of Independent Tanker Owners
ISF.....	International Shipping Federation

ITF..... International Transport Workers’ Federation

ITU ..... International Telecommunication Union

JIT ..... Just In Time

LL..... International Convention on Load Lines

LNG ..... Liquefied Natural Gas

LPG ..... Liquefied Petroleum Gas

MARPOL ..... International Convention for the Prevention of Pollution from Ships

MET ..... Maritime Education and Training

METHAR..... Harmonisation of European Maritime Education and Training Schemes

MLC ..... Maritime Labour Convention

MNTB ..... Merchant Navy Training Board

MPT ..... Maritime Professional Training

MSC ..... Maritime Safety Committee

OLQ ..... Officer Like Quality

PSC..... Port State Control

SIGTTO ..... Society of International Gas Tanker and Terminal Operators Ltd

SIRC..... Seafarers International Research Centre

SOLAS ..... International Convention for the Safety Of Life At Sea

SRA..... Social Research Association

STCW..... International Convention on Standards of Training, Certification and  
Watchkeeping for Seafarers

TMN..... Traditional Maritime Nation

UFS ..... United Filipino Seafarers

UKCES..... UK Commission for Employment and Skills

UMS ..... Unmanned Machinery Space

UN..... United Nations



UNCLOS..... United Nations Convention of the Law of the Sea  
UNCTAD ..... United Nations Conference on Trade and Development  
VET..... Vocational Education and Training

# CHAPTER ONE

## Introduction

---

### 1.1 Overview

This research is an empirical examination of education and training of merchant ship officers. It undertakes to examine whether there is a perceived gap between the training being provided to the officers and the actual competence they need to perform their duties in order to be considered ‘fit for purpose’ by their employers. If the main industry stakeholders perceive such a competency gap, the research seeks to identify how their perceptions are informed. Moreover, if such a skills and competency gap is prominent, the research aims to find out not only the nature of the gap, as perceived by the stakeholders, but also the underlying reasons for such a gap. Furthermore, the study will discuss how and to what extent such a perceived gap is being addressed within the industry and what extra measures need to be taken in order to bridge the skills gap.

The research question emerged from my professional trajectory as a seafarer combined with my work experience in the Maritime Education and Training (MET) field spanning about three decades. Writing in his PhD thesis, Anand (2011, p. 99) quotes from Atkinson et al. (2003), that “social scientists do not dream up ‘problems’ to investigate out of thin air”. In my case, the research question emerged from my personal experience working on board ships with multinational crew complements, where I could personally observe the inconsistency in knowledge, skills and competency of the seafarers from different countries and even graduates from different colleges within the same country. The issue was one of the widespread discussions between the senior officers, either formally when an accident, incident or near-miss happened, or informally in their casual chats. When I was offered a shore job in the training department of a large shipping company, I noticed that the issue of inconsistency of the seafarers’ competency was not only a shipboard topic among peer officers but also well recognised on the shore-side, reflecting the ship owners’ point of view. I noticed that at the time of recruitment of seafarers, especially recruitment of ship officers, the ship owners showed great concern about the seafarers’ nationality, the colleges where they were trained and the

issuing authority of their Certificate of Competencies (CoC).<sup>1</sup> Such concerns led me to embark on my quest to discover, through empirical research, how the stakeholders understood the issue and whether any common solutions to the perceived shortcomings could be identified.

## 1.2 Research Outline

Over the last four decades, the maritime education system has been substantially reformed and reshaped by the globalisation of the shipping industry and the rapid development of a global labour market for some 1.2m seafarers (IMO 2012) of all ranks (Alderton et al. 2004; Sampson 2004). In this context, the International Maritime Organisation (IMO)<sup>2</sup> has introduced an internationally agreed standard of MET for skills development of the industry's workforce. This is the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW). The STCW Convention is a minimum standard of competence prescribed for the seafarers to ensure '*safe*' operation of the ships. It is important to note that the safe operation of the ship is the prime objective of the Convention and while this can support increasing the yield of the shipping business, '*operational efficiency*' is not the immediate reason for the foundation of the Convention. The Convention has been in operation since 1978 and has, to date, undergone several minor changes and two major revisions in order to fulfil the requirements of stakeholders. It has been argued that despite the existence of the STCW Convention for nearly four decades, seafarers being trained and certified in different countries are still not uniformly trained and are not considered uniformly competent (Sampson 2003; Squire 2005). It has also been argued within the industry that despite implementation of the STCW Convention, many ship owners and ship operators perceive a gap between the competences required to fulfil the job and those developed through the STCW-based training (Deloitte 2011; Patraiko 2016). Although not much voice has been given to the officers in the literature, there is some evidence that they also perceive a gap in the education and training they receive and the skills they need to perform their on-board tasks (Madden 2017; Crewtoo 2017). In this context, it is important to examine how effective the STCW has been in producing

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<sup>1</sup> A certificate issued by the maritime administrations of countries, stating that the holder has been found duly qualified in accordance with the provisions of the specific regulation of the STCW Convention and has been found competent to perform specific functions, at the levels specified.

<sup>2</sup> A specialised agency of the United Nations responsible for the safety of ships and prevention of marine pollution from ships.

officers in the global labour market who are not only internationally certificated but also appropriately trained to fulfil their assigned duties on board ships.

This research undertakes to explore the nature of the perceived gap between the training being provided to seafarers in accordance with the STCW Convention and the actual competence *the ship owners* expect from the seafarers in order for them to be considered as a workforce that is ‘fit for purpose’ and to explore the implications of such a gap. Moreover, the research examines the perceived gap between the training being provided to officer trainees in accordance with the STCW Convention and the actual competence *the officer trainees and the officers* themselves find to be necessary prior to their enrolment for the assigned duties. The research also examines the perception of the *trainers* as another key informant of the research area.

By comparing the perspectives of the key stakeholders with regard to the gap in the current MET system, the research aims to find out whether there are discrepancies between the ship owners’ and the officers’ perceptions of a ‘fit for purpose’ workforce. Moreover, this research examines whether the current measures being taken by the stakeholders to fill the skills gaps of merchant navy officers are adequate and sufficient to enhance the quality of the workforce.

### **1.2.1 Scope of the Research and Key Definitions**

The STCW Convention applies only to the seafarers serving on board ‘seagoing ships’ and exempts from its requirements the seafarers serving on board warships, fishing vessels (there is a special convention for the seafarers of fishing vessels which is called STCW-F), pleasure yachts not engaged in trade, and wooden and primitive ships (IMO 2011, p. 14). The Convention makes a distinction between different seafarers. The seafarers are broadly categorised as ‘officers’ or ‘ratings’ working in different capacities and in different departments of the ships with specific sizes and engine powers. Moreover, the Convention makes a distinction between whether the ships are engaged in ‘near-coastal voyages’<sup>3</sup> or not. (The second category of ships are widely known as ‘ocean-going ships’). The qualification

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<sup>3</sup> The U.K. Merchant Shipping regulations (1997) define ‘near-coastal voyage’ as a voyage during which the vessel is never more than 150 nautical miles from a safe haven in the United Kingdom, or never more than 30 nautical miles from a safe haven in the Republic of Ireland. However, according to the STCW Convention 2010, (reg. I/1 .14) near-coastal voyage means ‘voyages in the vicinity of a Party as defined by that Party (this means that states set their own individual near-coastal limits).

requirements for the seafarers working on board near-coastal ships are different from those of ocean-going vessels.

The scope of this study is to examine the skills and competency of the merchant ship ‘*officers*’ of the ocean-going ships. However, during the course of this research, explanations and discussions may encompass the seafaring labour force as a whole. The target groups for data collection are mainly the shipping companies, officers and training institutions concerned with the crewing of the ocean-going ships.

### **1.2.1.1 Ship Owners, Ship Operators and Ship Managers**

Throughout this research, the terms ‘ship owners’, ‘ship operators’ and ‘ship managers’ are used interchangeably and all denote the role of employer (see footnote 24).

### **1.2.1.2 Skills Gap and Skills Shortage**

‘Skills gap’ is a term frequently used throughout this research. The term ‘skills shortage’ is also used on some occasions. In order to make a clear distinction between these two terms, the UK Commission for Employment and Skills states that ‘**skills shortage**’ refers to the situation where there are not sufficient appropriately trained and qualified people to be employed to fill the vacancies. However, the ‘**skills gap**’ exists when “members of the existing workforce in an organisation are seen to have lower skills than are necessary to meet current business needs” (UKCES 2009, p. 104)<sup>4</sup>.

### **1.2.1.3 Competence**

‘Competence’ is generally perceived as the ability to perform a task. However, the literature shows that the concept is not that simple. Boyatzis (1982), Hartle (1995) and Guthrie (2009) elaborate on this term and perceive that competence is ‘fuzzy’ because it may be seen as either a trait or ability of individuals. The industry’s expectation is to have ‘competent’ officers (see Baillie 1997) and according to Guthrie (2009, p. 18), being ‘competent’ is not just having ‘knowledge’ and ‘skill’. He states that, “Competency requires the ability to apply relevant

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<sup>4</sup> It can also be applied to circumstances where people are underemployed, where they have higher-level skills than those required to perform their existing job. However, to the best of the researcher’s knowledge, this is not applicable to shipboard jobs.

skills, knowledge and attitudes consistently over time, and in the required workplace situations and environments.” This concept along with Competency Based Training (CBT) is further discussed in Chapter Two.

### **1.2.2 Setting the Scene**

Ship construction, ship registration, ship management, labour training and supply were once predominantly concentrated within what Alderton and Winchester (2002) term the ‘Traditional Maritime Nations’ (TMNs). These were mainly countries in Western Europe and North America. Since the 1970s, the TMNs have experienced a radical decline in their maritime capacities with the number of registered national fleets falling, a reduction in the number of seafarers, and training institutes diminishing in both number and capacity (Alderton et al. 2004). This has happened within a period when developments in this international industry have become highly globalised, leading to the total restructuring and reorganisation of a once ‘national-based’ industry. This reorganisation has led to a situation whereby key industry functions (such as training and education, crewing, ship management etc.) have been globally diversified and are now mainly located within developing countries. This research will look at the implications for the training of seafarers of such a geographical shift.

The shipping industry, by handling almost 90 percent of traded products, is central to world trade and has a long experience of both national and international regulations (Alderton and Winchester 2002; IMO 2012; Bloor et al. 2013). However, the globalisation phenomenon caused the industry to undergo a significant de-regulation and re-regulation (Lane 1997; Alderton and Winchester 2002; Sampson and Bloor 2007; Gekara 2008; Sampson et al. 2014). Due to concerns over health and safety, environmental pollution, education, training and certification of crew, the global regulatory bodies such as the IMO and International Labour Organisation (ILO) came to play an important role in the global re-regulation process. The IMO, as the principal international regulatory body with a global standard-setting mandate, claims that the safety of life at sea, the marine environment and over 90 percent of the world's trade depends on the professionalism and competence of seafarers (IMO 2017). In recognising that skilled, educated, qualified seafarers are of fundamental importance, the IMO has been trying to put its emphasis on regulations for training and certification. Mr. William O’Neil, Secretary General of the IMO at the time, in a speech given in the biennial symposium of the Seafarers International Research Centre (SIRC), Cardiff (2001), stated that:

Today, the prosperity of tens of millions of people throughout the world depends on efficient sea transport which remains the most effective way to move goods in large quantities around this planet. Seafarers are key enabling forces in the modern globalised economy and it is therefore incumbent upon all of us to ensure that seafaring remains a profession to which people of the proper calibre are naturally attracted.

In recent years, there have been massive changes in the "supply side" of seafarers. We have witnessed a fundamental shift towards new labour markets concentrated in developing countries, particularly in Asia. It is essential that training assistance should be provided by the Western world so that the highest standards will be maintained. (O'Neill 2001)

Analysis of industrial accidents is a controversial issue and scholars, such as Nichols (1997), claim that the root causes have mainly been attributed to human error while social and economic determinants are often downplayed or ignored. This argument can be extended to the shipping industry and while the root causes of accidents at sea are complex, it is frequently claimed that 80 percent of accidents are attributed to human error (Goulielmos 1997; O'Neil 2003; Mitropoulos 2006; Emad 2011). As a result of the emphasis on human error in the shipping industry, there has been a focus on maritime education and training as the main measure to reduce casualties (ILO 1996; Psaraftis et al. 1998; Berg et al. 2013). This research attempts to examine all aspects of MET, including social and economic determinants.

While loss of life and property are the most serious results of maritime casualties, the consequences of the pollution hazards from oil, chemicals and other harmful materials due to marine casualties should not be underestimated. Without losing sight of other factors, the IMO considers that human resources are the most important factor for safe and efficient shipping (O'Neil 2001). Accordingly, the IMO has persistently attached the highest priority to the inclusion of the 'human element'<sup>5</sup> in its strategy. The MET system is facing the challenge of providing a continuing supply of competent individuals to crew the world's fleet.

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<sup>5</sup> In order to promote debate on all maritime-related 'human element' research in the shipping industry, a professional bulletin entitled 'Alert' has been established by the Nautical Institute (the international representative body for maritime professionals) and Lloyd's Register Foundation (a UK charity established in 2012, with a mission to protect the safety of life and property, and to advance transport and engineering education and research).

There is a rich body of literature examining the importance of the ‘human element’ in the shipping industry, especially the seafaring labour force, and I do not intend to revisit this issue in detail in this research. It is argued that many, if not most, of the problems relating to the world’s seafaring labour force have their origins in the twin processes of flagging out - the process of removing a vessel from a national registry – and deregulation which began in the late 1970s (Lane 1997; 1999; 2000; 2002; Kahveci and Nichols 2006). According to Lane (2000), until the mid-1970s, the main aspects of the national labour markets were regulated through the accord of employers’ organisations, trade unions, government agencies and voluntary organisations in virtually all nations with a shipping industry.

Under such circumstances, ship owners’ and seafarers’ representatives, examiners, nautical college principals, welfare workers and all other concerned parties regularly interacted and routinely found ways of making consensual decisions. According to Lane (2000) and Alderton et al. (2004) such a regulatory system, which was applied to a large proportion of the world’s internationally trading ships, was so similar among the TMNs that it effectively set international standards for MET. This was the time when a great deal of collective energy, at national and international levels, was being devoted to progressive reforms in education and training in order to train and retain a technically proficient seafaring workforce.

Such a well-established regulatory system and ‘informal alliance’ was undermined and eventually discarded as a result of the 1970s oil crisis and slump in world trade (Lane 2000; Lane 2002; Alderton et al. 2004; Kahveci and Nichols 2006). In order to reduce operating costs and stay competitive, ship owners adopted hasty survival strategies by moving into the unregulated space of open registry (where ships are registered under Flags Of Convenience - FOC), which offered lax regulatory regimes and allowed them to manipulate cost factors, such as taxes on ships, and employ cheap labour to their advantage.

Such a shift from a national labour market towards a global labour market was feasible because historically the seafarers’ hierarchy of all ranks was internationally uniform. Seafarers’ job descriptions, serving under different flags, were identical for corresponding ranks. According to Walters and Bailey (2013), the origins of shipboard work arrangements lie in militaristic forms of organisation, with hierarchical control, defined work places and work routines and



clear lines of authority. The principal work departments<sup>6</sup> and qualifications for each rank are mostly uniform and internationally recognised.

According to Kahveci and Nichols (2006), Panlibhon (Panama, Liberia and Honduras) countries are considered, *inter alia*, to be three of the major open registries which offered favourable operating environments to the ship owners. According to Lane (2000, p. 6), while the quality of the world's workforce had been steadily improving under the regulatory systems described above, the adoption of an FOC strategy meant that the main community of stakeholders within a nation no longer had such direct involvement with, or influence on, the bulk of their nation's maritime education and training.

Alderton et al. (2004, p. 49) argue that “the weakening of the system lay not so much in its standards but in its rootedness in national institutions that, by themselves, were unable to resist the impact of globalisation.” Under the new regulatory system in the world of shipping, the flag states do not show any intention of reviving the all-round mechanism of regulatory competencies that was once embedded within the maritime nations (Lane 2000; Alderton et al. 2004). Researchers, such as Alderton, Lane, Samson and Zhao, refer to a “spate of reports from underwriters<sup>7</sup>, the Salvage Association<sup>8</sup>, shipmasters and maritime administrations<sup>9</sup> from different parts of the world from the mid-1980s onwards that question the adequacy of the new world regime of maritime education and training (MET)” (Alderton et al. 2004, p. 81). It was not much later, in the early 1990s, when many shipping operators complained of the wide variation in the standards required for education and training and certificates of competency for seafarers ranging from high to, as Alderton et al. call it, “dangerously low” (2004, p. 82).

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<sup>6</sup> On most merchant ships, there are three principal work departments, i.e. deck, engine and catering departments. These departments are internationally recognised and ranks, job descriptions and workplaces are defined and competencies for each job are almost uniform on board ships, regardless of their nationalities.

<sup>7</sup> Marine underwriters are professionals, nowadays in the form of insurance companies, who provide marine insurance to the shipping companies.

<sup>8</sup> The Salvage Association, established in 1856, is the entity for protection of commercial interests on behalf of underwriters through undertaking surveys to establish the cause, nature and extent of damage to ships and cargoes and to provide advice to the concerned stakeholders.

<sup>9</sup> According to the STCW Convention, Maritime ‘Administration’ means the Government of the Party [to the convention] whose flag the ship is entitled to fly (STCW Convention 2010, p. 13).

While the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW 1978) was in place, higher requirements in standards of education and training for seafarers were still being called for, showing the inefficiency of the prevailing standards. Soon after the STCW 1978 Convention entered into full force in 1984, the industry stakeholders consented that the Convention was not achieving its aim of raising the proficiency of the merchant ship officers (ITF 2013). Sperling (1998, p. 597) elaborates on the flaws of the STCW 78 Convention and states that:

...While the IMO engaged in some monitoring, no mechanism existed for central oversight and enforcement [of the STCW 78 Convention]. Certificates were issued to candidates who met the requirements set out in the annex of the Convention ‘to the satisfaction of the Administration’, that is, of the government of the party flagging the ship. The door was thus left open to differences in interpretation and enforcement among national governments...the international shipping industry knows very well that there are plenty of administrations with a laissez-faire attitude to their manpower supply, which permits seafarers to be in possession of certificates without any real competence having been trained by incompetent systems...the 1978 STCW Convention was criticized for the absence of details on how to implement the standards, a lack of quality provisions and the failure to take into account the fast pace of development in the shipping industry. The 1978 Convention was seen as out of date and inappropriate for modern conditions.

Moreover, the first version of the STCW Convention was mainly focused on the ‘knowledge’ requirement of the seafarers. There was a lack of specific standards of competence related to the skills required to perform the shipboard duties. The Convention’s structure was not clarifying the level of competence and proficiency, the methods to demonstrate the competence or the criteria for evaluating the competence of the seafarers. Among other issues, these shortcomings in the provisions of the Convention also exacerbated the situation and resulted in the variation in the skills and competency level of the merchant ship officers.

A very extensive discussion of these issues resulted in the substantial revision of the STCW 1978 Convention in the early 1990s and the introduction of major amendments to the Convention, the so-called STCW 1995 amendments, which aimed to retrieve the training standards lost in the 1970s and 1980s, as discussed earlier (IMO 2006). The STCW 95 has a Competency Based Training (CBT) mechanism, which is mainly college-based training with significantly reduced on-board experience requirements.

According to Alderton et al. (2004) the move offshore in those two decades not only led to the recruitment of large numbers of inexperienced crew members, it also resulted in a substantial decline in MET in the embedded maritime nations (or Traditional Maritime Nations), and a growing reliance on the under-resourced, inexperienced and poorly-regulated MET colleges found in some of the new labour supply countries, such as the Philippines.

With the introduction of STCW 1995, the global shipping industry aimed for a clear and globally standard set of requirements for the education, training and certification of seafarers as well as the procedures that the maritime administrations must carry out in uniform implementation of the requirements. However, about two decades since the introduction of the STCW 1995, leaving aside the debate of sufficiency and effectiveness of the ‘minimum requirements of education and training’ introduced by the STCW Convention, there still remained often substantial variations in the standards of supervision, curricula content, overall quality of training institutions and in particular the quality of the competency of seafarers (Alderton et al. 2004).

In 2006, having received reports for more than a decade from industry stakeholders of the STCW 95’s shortcomings, the IMO decided to review the STCW to ensure that it would still meet the challenges that the shipping industry was facing and would confront in the near future. The revised text of STCW was finalised and adopted at an international conference held in Manila in 2010.

Along with the changing context of the industry as the result of the globalisation phenomenon and the resulting deregulations and shifts towards the global labour market, the industry also experienced significant changes in the context of the workplace due to rapid advancements in technology. The introduction of new technologies, including automation of machinery, complex and sophisticated equipment, containerization of seaborne cargo, new ship types, etc. has changed the on-board tasks, the way they are performed, and consequently the job descriptions of the seafarers (Emad 2011). Emad further states that the use of new technology brought new features relevant to workplace learning which demanded changes to the education and training of the seafarers. These issues are examined in Chapters Two and Three of this thesis.

### 1.3 Overview of Research Aims

The research within this context will aim to investigate whether the workforce being educated, trained, and certified under the contemporary MET system and in accordance with the internationally agreed standards of the STCW Convention, fulfils the perceived requirements of the employers. It will investigate whether the ‘minimum training requirements’, as set by the current STCW Competency Based Training (CBT) mechanism, provide adequate knowledge and skills to enable the officers to undertake shipboard duties. In order to achieve these aims, the research will examine whether stakeholders perceive a gap between the training being provided to the officers and the actual knowledge and skills they need to competently perform their duties. Should the stakeholders perceive a gap, the research further aims to examine its nature and the underlying reasons for such a gap. The research will examine whether the stakeholders are addressing the perceived gaps in order to bridge the competency issues of the seafaring workforce. A comparison will be made between ship owners’ and officers’ accounts, to explore whether there are any discrepancies in their perceptions.

The main aim of this study is *‘to examine the underlying reasons for the perceived skills and competency gap of the merchant ship officers’*. To achieve this aim, the following research questions will be addressed:

- ***What informs the main stakeholders’ (ship owners, ship officers and trainers) perceptions, concerning the ship officers’ skills and competency gap?***

This question examines the way stakeholders perceive a ‘skills and competency gap’ and the basis on which they ground their views. The findings are used to understand the means through which the competency of the officers is observed and monitored in real practice. At the same time, the findings will be employed to assess the significance of the ‘skills and competency gap’ of the merchant ship officers.

- ***What is the nature of the perceived skills gap, as understood by informants?***

This examines the nature of the skills gap, as perceived by informants. Answers to this question are essential determinants of the research that will enable the researcher to categorise the skills gap and investigate the root causes of the shortcomings.

- *What are the impediments to the education and training of the officers, as perceived by the stakeholders?*

This question will examine the stakeholders' perceptions regarding potential factors that could affect the outcome of the training. The answers to this question may shed light on the underlying reasons for the shortcomings in the skills and competence of the officers.

- *Are the perceived gaps between the training being provided to the officers and the actual skills they need to perform their assigned duties adequately addressed by stakeholders?*

By asking this question of informants, the research examines what, if any, actions are being taken by the stakeholders to bridge the perceived skills gap. Responses to this question will also shed light on whether increased globalisation has affected the MET system's response to the identified skills gap.

## **1.4 Overview of Theoretical Framework of the Thesis**

At the outset of the research, I came up with my broad research question and set the aims of the study. Then, with the advice I received from my supervisors, I designed the research and scheduled and conducted pilot interviews. It was not long after conducting the pilot interviews when I realised that the main themes emerging from the preliminary data suggested that the prominent issue of the 'skills gap' could be closely related to the shortcomings in the 'practical aspects' of the education and training of officers. This was also consistent with my own on-board experiences. Further interviews with different stakeholders, especially the officers and trainers, highlighted the prominence of the practical training of the workforce and the perceived shortcomings in this area in the contemporary MET system. From this stage, I started looking at the historical background and evolution of the education and training of the seafaring workforce. At the same time, I started studying learning theories to gain a better understanding about education and training and the learning process and patterns. My supervisors advised me to read 'The Knowing-Doing Gap', a book written by Pfeffer and Sutton (2000). Research conducted by Pfeffer and Sutton, explored why knowledge of what needs to be done frequently fails to result in action or behaviour consistent with that knowledge. They call this the "knowing-doing" problem (Pfeffer and Sutton 2000, p. 4). One of the most important insights from their research is that knowledge that is actually implemented is much more likely to be

acquired from learning by doing rather than from learning by reading, listening or even thinking (Pfeffer and Sutton 2000, p.6).

It is possible that the difference in seafarers' performance comes from differences in the quality and depth of what individuals 'know' in theory. It could also be due to the seafarers' inability to turn their knowledge into practice, as described in Pfeffer and Sutton's 'knowing-doing' concept (see Baillie 1997). By examining the appropriate learning theories in the maritime domain, it is intended to gain an insight into whether the MET system provides adequate training opportunities for the seafarers to turn their knowledge into practice and develop the skills needed for shipboard operations.

Prior to the introduction of the STCW 78 Convention, the apprenticeship model of training was the most common means for seafarers to acquire the maritime competencies (Cicek et al. 2002; Emad and Oxford 2008). This was the time where the ship owners had a relatively good level of surveillance on the quality of their shipboard workforce throughout the whole process of selection, recruitment, training and deployment, and thereafter in the arrangement and support of their progressive education and training cycles. The ship owners, in order to comply with their shipboard workforce needs, were committed to recruit mainly their native apprentices and despatch them to work and learn on board their fleet, under supervision and mentoring of the officers. This is often referred to in the literature on learning theories as skills development within a 'community of practice'<sup>10</sup>. Examples of learning theories include 'activity theory', developed from the work of Lev Vygotsky (1896–1934), 'learning by doing' (Dewey and Dewey 1915), and 'experiential learning theory', which was built on the Dewey work by David Kolb in the 1970s.

As a result of the move to the FOC, and the shift from a national to global labour market, ship owners became less interested in participating in training (Lane 2000). This resulted in a significant reduction in the shipboard berths for new trainees. This issue, together with the introduction of the STCW Convention, which put more emphasis on the theoretical training of the officer cadets, resulted in a shift from shipboard to shore-based training of officer cadets.

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<sup>10</sup> The concept of 'community of practice' was first proposed by cognitive anthropologist Jean Lave and educational theorist Etienne Wenger in their 1991 book *Situated Learning* (Lave and Wenger 1991). This concept is further explained in Chapter Three.

## **1.5 Structure of the Thesis**

The thesis is structured in nine broad chapters. In this introductory chapter, I have outlined the research context and key aims of the thesis.

Chapter Two provides an extensive review of globalisation within the shipping context. In this chapter, the process of economic globalisation, leading to de-regulation and re-regulation of the shipping industry and the impact of globalisation on the shipping labour market are explained. The need for standardisation of the regulations within this global industry and main regulatory bodies, with an emphasis on the regulations related to education and training of the seafaring labour force, is outlined. An introduction to the main regulatory bodies of the shipping industry is also presented. The chapter further explains the transformation of the 'workplace' due to technological advancements in shipping and the need for changes to the skills requirements of the shipboard operation. Finally, the historical background of the Maritime Education and Training (MET), evolution of the STCW Convention and contemporary literature in this area are examined.

Chapter Three describes learning theories applicable to maritime education and training and explains their relevance to this thesis.

Chapter Four outlines the methodological approach and the specific methods that are selected to achieve the aims of this study. This chapter also describes the key issues around access to data and interviewees, financial limitations and ethical issues.

Chapters Five, Six and Seven detail my research findings. They consist of a thematic discussion of informant accounts, based on interviews with the ship owners, officers and trainers.

Chapter Eight consists of a comprehensive critical discussion of the research findings. This is where the underlying aspects of the skills and competency gap of the officers, as perceived by the main stakeholders, are discussed in depth and cross-thematic analysis is carried out.

Chapter Nine is the concluding chapter that starts by revisiting the background of the study, looking at how economic globalisation and technological advancements in shipping have affected the education and training of merchant ship officers. It also reviews key findings, explains how this research has contributed to the literature, offers recommendations, reflects on the limitations of the study and suggests issues for future research.

# CHAPTER TWO

## Globalisation, Competent Labour and MET: The Changing Context of the Maritime Industry, Workplace, and Skills

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### 2.1 Introduction

This chapter begins by providing an exploration of globalisation in the context of shipping. It demonstrates how economic globalisation and the movement of capital together with de-regulation have resulted in changes in the organisation of the shipping industry, putting particular emphasis on the changes to labour supply. It also looks at changes to maritime education and training, including the extension of training provision from traditional maritime nations to emerging shipping labour supplier countries.

Another prominent factor in the changing context of the workplace is the technological advancements that have occurred in shipbuilding and equipment. The resultant need for changes to the training and skills development of the seafaring workforce is also presented in this chapter.

As a result of both globalisation and technical advancement, changes have taken place in the shipping industry and labour force supply, as well as a transformation of work and the workplace. These changes have highlighted the need for global governance and standardisation of regulations in the industry. The need for global governance and the regulatory bodies who govern the safety and competency requirements of the shipping labour force are explained in this chapter.

The safety of all ships operating in the marine environment is a matter of global concern. As the world has witnessed over the past decades, several maritime accidents have caused a horrendous loss of human lives and immense damage to the marine environment. Such accidents need to be prevented. During more than fifty years of its existence, the International



Maritime Organisation (IMO) - formerly known as Inter-Governmental Maritime Consultative Organisation (IMCO) - has developed rules, regulations, technical standards and codes of practice to enhance the safe and efficient operation of ships and prevent marine pollution. There are more than fifty IMO conventions and agreements and numerous protocols and amendments incorporating the standards for maritime safety and pollution prevention (IMO 2016). The adoption of these standards, rules and regulations is very important but present considerable challenges when applied on a global scale.

Moreover, appropriate measures need to be taken to ensure their effective implementation by those who control, manage or operate ships. For this purpose, highly trained and skilled personnel are required, both afloat and ashore. In addition to basic maritime training, specialised training is required for the management and operation of ships. Appropriate training is also required for other role-players in the industry such as maritime administrators, surveyors, technical managers of shipping companies, port authorities, teachers and examiners to implement the rules and operate the ships.

Although all of these key stakeholders of the maritime industry need appropriate training in order to facilitate the safe and efficient running of the industry, the IMO has given the highest priority to the training standards of seafarers who are in the forefront of the industry. This chapter concentrates on the standards set for the education and training of seafarers. In order to do this the historical background and evolution of Maritime Education and Training (MET) and contemporary literature in this area are examined.

## **2.2 Free Trade, State Intervention and Globalisation in the Shipping Industry**

It has been argued extensively in the literature that merchant shipping is one of the most globalised industrial sectors (Alderton and Winchester 2002; Sampson 2003; Alderton et al. 2004; Selkou and Roe 2004; Kahveci and Nichols 2006; Sampson and Bloor 2007; Gekara 2008; Walters and Bailey 2013). The ownership and management chain surrounding any particular merchant navy vessel can involve many different countries. It is not unusual to find that the owners, operators, shippers, charterers, insurers and seafarers are all of different nationalities and that none of these are from the country whose flag flies at the ship's stern (IMO 2005, p. 9). There is, therefore, the need for a framework of international standards to

regulate this industry; standards that can be generally consented, adopted, implemented and enforced by the nation states. Without internationally recognised and accepted standards, it seems impracticable to operate a vessel that even if it is fully compliant with the regulations of the country of origin, sails to other countries where different sets of rules and requirements could be in practice. This common approach is necessary so that ships can operate around the world in a manner in which countries receiving them can be confident that, in giving them access to their ports and waterways, the visiting vessels do not place their safety, security and maritime environment at an unreasonable risk. In order to build up such an internationally accepted environment, shipping has evolved through centuries. This evolution has been radical with the emergence of economic globalisation within the past few decades.

In order to understand the nature of globalisation in the shipping industry, it is essential to have a clear picture of the concept of globalisation. A rich body of literature shows that globalisation is undoubtedly one of the most deliberated topics in contemporary debate (Hirst and Thompson 1992; Scholte 2000; Giddens 2002; Hirst et al. 2009). Scholte (2000) perceives globalisation as a concept that applies to a diversity of cultural, social, political and economic perspectives. It is a term used to describe how human beings are becoming more interdependent around the world. Many scholars describe globalisation as a process of de-territorialisation which facilitates free and unrestricted movement of capital, thus allowing easy cross-border economic activity, free trade and greater international economic integration (Scholte 2000; Giddens 2002; Held and McGrew 2002; Stiglitz 2002).

Historically, trade flowed across nations and cultures, linking the economic prosperities of societies together as well as acting as an intermediary for ideas and technological practices. This kind of interaction was the basis of Adam Smith's theory of absolute advantage, and David Ricardo's theory of comparative advantage (Schumacher 2012; Dev Gupta 2015). Discovery of Latin America, passage to the Far East and India, discovery of new sources of raw materials, new sources of plantations, slavery and many other new developments of this kind, introduced new trade routes and accelerated the expansion of merchant capitalism and world trade (Held and McGrew 2002). Merchants have long crossed borders in the pursuit of economic opportunities, and states have supported their profit-seeking activities, recognising the benefits and prosperity to their nations. This was the beginning of an extensive pattern of trade across borders. After World War II, the infrastructure for communication and transportation – two crucial means of interaction – improved dramatically. According to Lechner and Boli, (2004,

p. 1) such links were the “raw material of Globalisation”. Development of trade discovered new routes and development of merchant capitalism became more important. Merchant capitalists and industrial capitalists were better aware of the world developments and looked for better living conditions through free trade, as one of the means for capitalist economic growth, hoping that free trade would boost economic growth and consequently bring them wealth and prosperity. This happened under the direct command of nation states that had the utmost authority over all economic activities and all resources involved, such as labour, capital and trade, within their boundaries and jurisdiction (Held et al. 1999; Held and McGrew 2002).

At that point, national strategies were mainly put in place to protect domestic industries. It was in the mid-1970s that things started to change as companies within advanced states started looking beyond national limitations for better opportunities. While on the one hand nation states were trying to safeguard their national interests through their policies, regulations and protectionist doctrines, on the other hand, in the wake of globalisation, corporations with expansionist interests were being developed (Gekara 2008).

However, the practices of nation states were not set up to accommodate such expanding trade relationships. Therefore, the nation states found themselves in a position where they had to accommodate the new features of a globalised economy in their current economy, in a way that would best fit the interests of their nations, and started making changes to their regulations.

Similar processes to those discussed above, in relation to nation states versus globalisation, could be observed in shipping, in terms of shipping under national flag versus Flag Of Convenience (FOC) and an influx of de-regulations in the shipping industry. FOC is explained in detail further in this chapter. In the beginning, shipping companies were nationally based but operated internationally under the rigid regulatory systems of nation states. They were dependent on state protection for survival (Metaxas 1985). This relationship gradually changed to the point that presently most shipping companies operate largely beyond the owners’ actual nation state regulations (ie the nationality of the majority of beneficial owners is not the same as that under which their ships operate), and instead operate under the lax regulations of FOC. In order to examine this trend, we will now take a brief look at the key aspects of shipping policies.

### **2.2.1 A Historical View of Shipping Policies**

According to Selkou and Roe (2004), political and economic forces that developed within the last two decades of the nineteenth century introduced a new phase of international political economy. Cafruny (1987) highlights the importance of the new phase as intensification of international competition and increasing concentration of capital, nationally and trans-nationally, combined with the greatly enlarged role of the state in economic affairs.

According to Odeke (1984), between 1880 and the late twentieth century, the trend towards shipping liberalism was transformed into one that was characterised by the increasing formation of cartel arrangements and the extended role of state intervention. During this time, the tendency towards concentration of ownership and intensification of international competition had a significant impact on shipping policies. Some traditional maritime nations, in efforts to strengthen their national shipping industry, facilitated mergers and promoted cargo reservation schemes (Cafruny 1987). Although the post-World War II period appeared to contain some degree of liberalism within the shipping sector, the level of truly free trade was rather limited. These trends led to a tendency towards an intensification of shipping subsidies (Selkou and Roe 2004). Subsidies were normally considered to be tools to assist in sustaining the prosperity of what was viewed by states as a vital national maritime industry. Selkou and Roe (2004) attribute the application of such subsidies and protectionist practices to perceptions of national governments that there was an essential need for the maintenance, establishment and development of domestic merchant fleets in the context of intense pressure from other fleets worldwide. Writing about thirty years before Selkou and Roe, Sturmeay (1975) revealed how this trend was followed until the late 1950s and into the 1960s. These sorts of protectionist practices might have led to the maintenance of the national fleets and safeguarded national employment.

Due to radical economic and political changes that have been taking place throughout the world, especially during the second half of the twentieth century, the characteristics of both national and international maritime policy have been subject to major adjustment since the 1970s (Selkou and Roe 2004). According to Button (1993), there are specific reasons for states to have shipping policies. By setting policies, states impose their role by interfering with shipping activities and preventing those in the market from organising themselves without regulations and advice (Selkou and Roe 2004). Examples of such policies include containment of monopoly power, control of excessive competition, regulation of externalities (e.g. pollution

control and garbage disposal), provision of public goods (e.g. navigational buoyage systems), social conditions, and training qualifications for workers at sea (Button 1993).

However, the gradual development of a global environment for trade has been well documented (Daniels and Lever 1996; Cleaver 1997; Dasgupta 1998; Held et al. 1999; Moore 2003; Buckman 2005). In the shipping sector, many scholars have attributed the obvious manifestation of the new era of global trends in shipping policies to the growth of open registries of ships, mostly referred to as 'Flags Of Convenience' (FOC) (Alderton and Winchester 2002; Donn 2002; Alderton et al. 2004).

### **2.2.2 Liberalisation and Free Market Policy in Shipping**

Frankel (1992) states that since the late 1970s there has been a considerable reduction in the advocacy of extended nationalism and state control in the shipping sector and it has been replaced by privatisation and further deregulation and reforms in international trade and shipping. Governments once regularly worked against freeing up the maritime sector through regulating, protecting, subsidising and restricting the operation of foreign investors and operators. However, these have progressively been replaced by free market incentives and the call for liberalisation of the shipping sector including reductions in national shipping regulations and a variety of other types of government control (Selkou and Roe 2004).

The history of shipping suggests that it is a volatile and capital-intensive business. Ship owners, classification societies, insurance companies, legal advisors, maritime administrations, port authorities, training institutes, ship builders, cargo owners and last but not least, shipping companies providing various services all over the world are interwoven players of this industry. As such, shipping is an international industry where various parties belonging to different and multiple countries commonly take part (Paixao and Marlow 2001). As Sampson (2004, p. 245) states:

The industry is regulated, owned, managed, financed and supplied with labour on an international basis. A vessel may be owned in one country, technically managed in another, have its crew supplied by several others, trade internationally and be registered in any one of a number of nations operating open registers. As such, the industry provides us with a fascinating example of how a truly global industry operates, and no more so than when considering issues of labour markets and the regulation of standards of education and training.

Selkou and Roe (2004) and many other scholars consider maritime transport as the largest service provider in international trade. According to figures compiled by shipping information providers Clarksons (SeaNews 2013), the world's fleet of vessels actually carrying cargo reached one billion Gross Tonnage (GT) in September 2012, and since then has grown to 1.01 billion, comprising 57,400 ships, today. It is estimated that more than 90 percent of the world trade is being carried by ships (Selkou and Roe 2004; Mitropoulos 2005).

The above suggests that global trade strongly depends on sea trade, as the most efficient mode of transportation. This can only be facilitated by a reliable and standardised shipping industry with safe ships and a competent workforce.

### **2.2.3. State Intervention in the Safety of Shipping**

Safety is another prominent issue commonly addressed at state level. This is something that the market and private sector may not achieve as the linkage between commercial success and standards of training and work conditions (two important components of safety) is not only weak but also not always direct and clear (Button 1993). In this regard some of the earliest maritime policies aimed to raise the standard of working conditions and qualifications of those who work at sea. Boisson (1999) states that until the end of the Roman Empire, seafarers were ill equipped to confront sea perils. He further states that certain western countries, such as Spain, France and Britain, as the pioneer nation states, developed safety-related rules and increased control on ships. This trend began in the first half of the eighteenth century and by 1850 the Merchant Shipping Act was introduced by Britain. Boisson (1999) calls this 'the most important advance' in shipping legislation which marked the real start of state action in regulating and controlling all issues related to merchant shipping, specifically the issues related to the safety and working conditions of seafarers. Regarding these issues, while the states remain responsible for implementation of the national and international legislations, the International Maritime Organisation (IMO) and International Labour Organisation (ILO), two specialised agencies of the United Nations, also play a large role in the new era. The roles of these two organisations are briefly examined later in this chapter.

In the next section, we will see that shipping not only operates in a global business environment but also utilises that environment in its employment of global labour markets through the flexibility offered by the international market of ship registers. However, it is also important to document some prominent issues such as the technological developments in shipping which

have had an impact on the rapid globalisation of the industry and examine how these have affected seafarers' safety, working life, employment, education and training.

## **2.3 Impact of Globalisation and Technology in the Context of Shipping – Labour Market Transformation**

There are some important issues attributed to the emergence of globalisation that affected shipping, and consequently the seafarers, during the 1970s and 1980s. One of the prominent issues was the global economic recession in the 1980s which had an adverse impact on shipping. On the one hand there was the “structural readjustments in the world economy” (Alderton et al. 2004, p. 2), which led to a substantial fall in freight rates (the price per unit of the carriage of cargo) as world trade went into recession. On the other hand, a flood of new and cheap ships launched from the subsidised and protected shipyards of the world in the late 1970s undoubtedly produced ‘excessive capacity’ and consequently exacerbated the bad trading period (Alderton et al. 2004). The oil crisis in the 1970s was also a major challenge for seafarers since ship owners and ship operators slashed operating costs in order to stay competitive. Cost pressures, along with emerging technological developments, such as containerisation of the cargo units and automation, led them to reduce the manning scale of the ships. That, in turn, resulted in redundancy of many seafarers, causing major changes to the nature, source and structure of crews (Morris 2001). In order to reduce operating costs and stay competitive, ship owners adopted hasty survival strategies by moving into the unregulated space of ship registry where lax regulatory regimes allowed them to manipulate cost factors, such as taxes on ships and cheap labour, to their advantage (Lane 2002). In order to have a better insight into these changes, it is necessary to examine the issue of ship registry and FOC.

### **2.3.1 Registry of Ships and Flags of Convenience**

The United Nations Convention of the Law of the Sea (UNCLOS) recognises that each state has a right to establish the conditions for the granting of its nationality to ships. These conditions should address administrative, technical and social policy matters, and include the seaworthiness of the vessels and the manning and training of crew (UN 1982).

After World War II, the merchant fleet of the world was owned primarily by the economically advanced nations and most vessels were registered in the nations where their owners resided.

The twentieth century saw a significant shift in ship registration from ‘embedded’ maritime nations to ‘open registries’, commonly known as Flags Of Convenience (FOC) (Carlisle 1981; Alderton et al. 2004). The earliest examples of this phenomenon were usually where the decision to re-flag was taken for political or military reasons, whilst the more recent examples are much more likely to be on economic grounds and reflect the globalised nature of an industry which can effectively choose any country it wishes in which to register its assets whilst remaining formally elsewhere (Selkou and Roe 2004; Kahveci and Nichols 2006). One of the primary reasons that vessels register in FOC states is the ability it gives them to avoid restrictions on the use of labour, the pay and benefits they receive, or the composition of the crew of any nationality (DeSombre 2000; Sampson and Schroeder 2006). In order to attract more ships to their flags, the FOCs, mainly with low or even lacking regulatory capacity, compete with each other by offering more favourable treatment and relaxed regulations. It might be construed that they are selling regulations at the cost of deteriorated health and safety, and working and living conditions of seafarers (Alderton et al. 2004).

It is claimed by scholars that the key component of globalisation in the maritime industry is the development of open registries and ‘crews of convenience’ (Alderton and Winchester 2002; Donn 2002; Alderton et al. 2004). The International Transport Workers’ Federation (ITF)<sup>11</sup> regards flags of convenience to be where the nationality of the owner is different from the country of registration. Flag of Convenience (FOC) and Crew of Convenience (COC) have broken the link between the ownership of a vessel, the nation where it is registered and the nationality of the crew that sails it. Emergence of flags and crews of convenience had a dramatic impact on employment opportunities for seafarers in the traditional maritime nations. Kahveci and Nichols (2006, p. 18) consider a flag of convenience as a flag which allows:

1. lower crewing costs requirements, since registration under a flag of convenience generally means unrestricted choice of crew in the international market; not being subject to onerous national wage scales; more relaxed crewing rules;

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<sup>11</sup> ITF is an international trade union group which has carried out a campaign against FOC (Donn 2002).

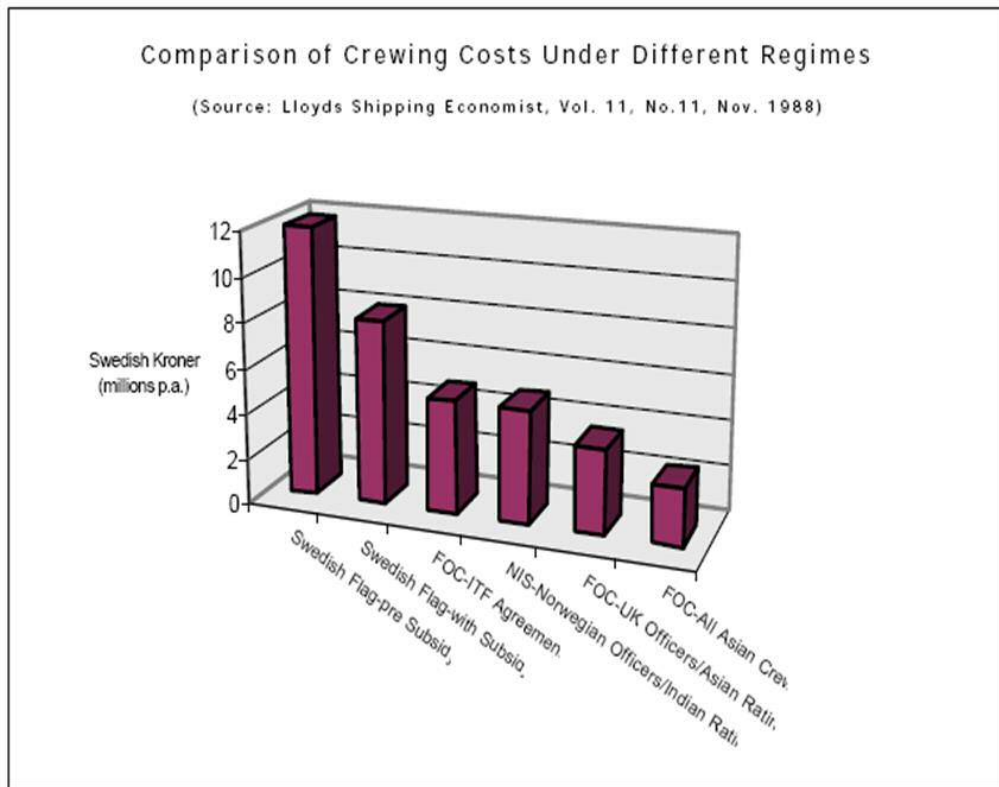


2. lower operating costs generated by 'lighter' maintenance programmes and less stringent enforcement of safety standards imposed by the register;
3. less regulatory control and avoidance of bureaucracy;
4. the probable avoidance of tax;
5. anonymity;
6. easy accessibility/exit to/from registry.

Figure 2.1 overleaf (cited in Lane 2000, p. 9), is based on an analysis produced by Swedish ship owners in 1988. It illustrates a comparison of crewing costs under different regimes and indicates the ship owners' desire to reduce labour costs.

According to Donn (2002), during the rapid spread of FOC, typically a two-tiered system of employment had emerged in the world shipping industry. These two tiers are separated by shipping segment and by nation of vessel registration. Arguably, Donn claims that one provides a high standard of living and favourable working conditions (TMNs) while the other (open registry) provides low wages and often exposes seafarers to the risk of exploitation including inhumane treatment and unsafe conditions (Chapman 1992; Couper 1999).

This is not to say that all national flags are top quality and all FOCs are sub-standard in terms of safety at sea and the welfare of ships' crews. As Ready (1994, p. x) asserts, "The flags of convenience are not and in fact never have been the exclusive province of the 'cowboy' operators." Notwithstanding the arguments against flags of convenience, for more than half a century the practice has evolved and grown to the extent that by January 2004, 60 percent of the world fleet was registered under an open registry flag (see Figure 2.2 overleaf) and it has continued to increase. According to the United Nations Conference on Trade and Development (UNCTAD), in 2015 the tonnage registered under a foreign flag was about 71 percent of the world total (UNCTAD 2015, p. 41).

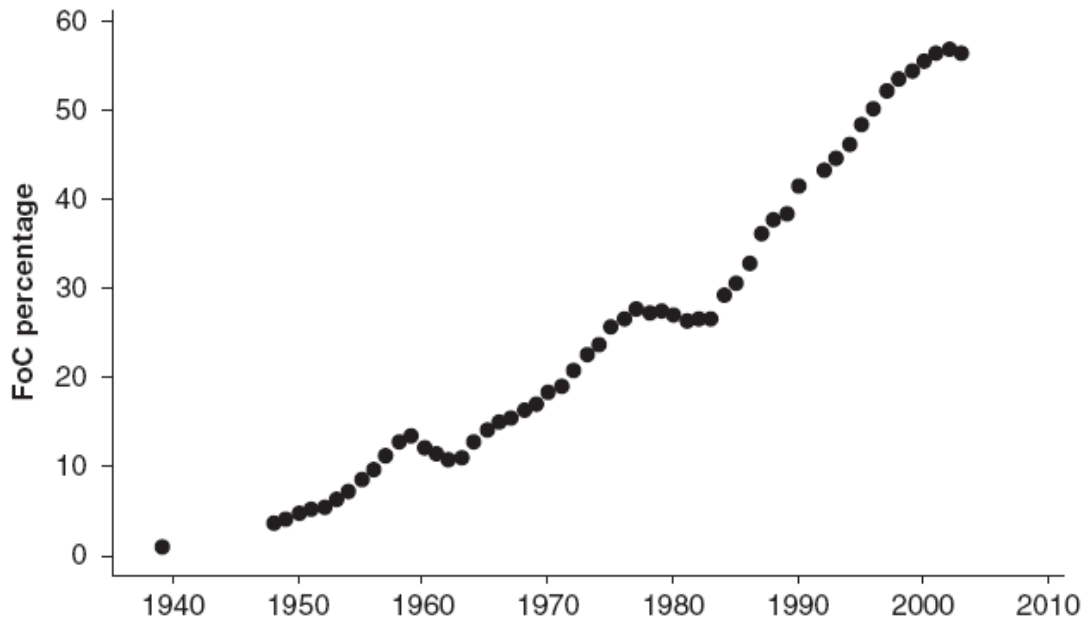


**Figure 2.1 Comparison of Crewing Costs<sup>12</sup>**

Source: Lane (2000, p. 9)

What can be inferred so far, with regard to the evolution and development of the shipping policy and in particular the recent growth of open registries, is the desire of ship owners to minimise costs and therefore utilise the cost benefits that these registries offer. According to Marlow et al. (1997) ship owners' and shipping companies' decisions are clearly influenced by financial considerations.

<sup>12</sup> In Figure 2.1: The X (horizontal) axis comprises the following: Ship under Swedish flag regulations without state subsidy; Ship under Swedish flag, subsidised by state for crew wages; Ship under Flag Of Convenience under ITF agreement for crew wages; Ship under Norwegian International Ship Registry - crew complement of Norwegian officers & Indian ratings; Ship under FOC - crew complement of the UK officers & Asian ratings; Ship under FOC – All Asian Crew. The Y (vertical) axis indicates the crew cost per ship per annum in Swedish Kronor.



**Figure 2.2 Flagging Out and World Tonnage (grt) 1939–2003**

Source: Kahveci and Nichols (2006, p. 19)

The key issues explained above had a significant effect on the changing context of the shipping industry that in turn has had a substantial impact on the lives, work, and employment relations of the seafarers who work on board ship. In particular, by the end of the twentieth century, a multi-faceted system of employment had emerged in the world shipping industry (Donn 2002). During the first half of the twentieth century seafarers could be employed by national companies and serve on board their national flags under a well-regulated national employer-employee relationship and with well-secured jobs. However, during the past four decades, seafarers have been employed in a relatively deregulated labour market with little or no job security. They are being increasingly employed by ship management companies, through a well-developed network of independent crew agencies from relatively poor parts of the world (Kahveci et al. 2002; Sampson and Wu 2003; Alderton et al. 2004).

### **2.3.2 Flag Of Convenience, Labour Market and Education and Training**

Regarding the labour market framework of the shipping industry, Lane (2000, p. 4) states that until the mid-1970s in nearly all countries with a shipping fleet, labour markets were regulated

in a similar way. Legislation, standards of safety, education etc came under state control but decisions were made through an informal consensual arrangement between employers' organisations, trade unions, government agencies and voluntary organisations. He attributes the strength of such a regulatory system to "its ability to continuously develop best practice in one part of the system and export it to all other parts, so regulation, far from being a dead hand, was actually a source of great dynamism (p. 5)." In the 1960s a great deal of collective energy was being devoted to progressive reforms in education and training, welfare and employment terms and conditions in order to build and retain a well-trained and proficient workforce.

With a slump in world trade during the 1970s, shipping companies embraced different one-off survival strategies, in an attempt to minimise costs and remain competitive. A search for cheap labour was one of the hasty measures adopted by many enterprises. According to Kahveci and Nichols (2006, p. 18):

... enterprises that wish to cut labour costs have a choice, constrained by particularities in each given instance: either to export capital (shift their operation abroad; or less drastically, shift to a low wage area in the same state) or to import labour from cheap labour zones...By engaging in fictitious capital export – altering the national registration of their vessels - the ship owners could achieve the advantages that land-based employers get when they shift their factories abroad - and not only this, they were able to access labour from the whole world's cheap labour zones.

These strategies resulted in breaking the bonds of shared nationality between employers, seafarers and maritime training institutions (Lane 2002, p. 3). According to Lane (2000, p. 6) it was no longer practically feasible for the well-developed 'informal alliance' of ship owners, maritime educationalists, trade unions, etc. to be directly involved or influential in the training and education of the great bulk of the seafarers. The widespread resort to flags of convenience detached the links of common citizenship between ship owners and seafarers and between training and certification and flag state. Lane (2002, p. 3) further claims that "the regulatory void in this turbulent and inherently unstable market is a major problem for everyone in the industry."

## **2.4 Impact of the Technological Advancements on Seafarers' Working Lives and Skills**

The literature shows that seafarers' working lives have been changed to a great extent during the past four decades. Examples of such changes are working on board ships with multinational crew and intensification of work due to a reduction in the number of crew members on board ships. However, it is important to note that not all of these changes can be attributed solely to globalisation but also to technology and advancements of ships. The introduction of the iron-hulled and steel-hulled vessels powered by steam was a rapid technological advancement and was indeed considered as the beginning of modern shipping. It meant that ships could move faster and undertake longer voyages with increased carrying potential. The next step in technological innovation was the introduction of the diesel engine in 1912. The new engines offered even greater efficiency than the steam turbine with increasing speed and extended advantages of fast ships. In the years to follow until the 1980s, there were rapid developments in ship size and design with increased automation in ships' equipment, computerised engineering, modern cargo handling and automated navigation. There has been a dramatic change in the composition of the world's merchant fleet. Giant tankers, a new generation of container ships, gas and chemical carriers, sophisticated chemical carriers and large bulk carriers, which were unknown in the early 1950s, now constitute the world's modern merchant fleet. One of the greatest developments in respect of ship design and operation was the introduction of containerisation in the 1960s which completely revolutionised international transportation and had great implications on the nature of work both at sea and in port (Stopford 1997). Containerisation, in conjunction with Just-In-Time (JIT) logistics and management, has affected the working lives of seafarers drastically (Sampson and Wu 2003; Alderton et al. 2004; Kahveci and Nichols 2006). All these developments saw ships become faster, more efficient and cost effective and, in terms of manning, crew levels were roughly halved from what they were at the introduction of the steam engine. Osterman (2010, p. 2) states that:

Great technological developments have transformed the societal topography onboard, just as in other industries. Many tasks previously performed by hand can now be executed faster, cheaper and more accurately using machines, enabling crew reductions as a way to minimize operation costs. Yet, the human element is an indispensable part in any work system.

At the same time ports were growing bigger and more efficient hence port turn-around times were reduced drastically (Kahveci 1999, Gardner et al. 2001). Some of these changes might be attributed to the technological innovations and advancements but most of them can be traced to globalisation. However, these two emerging issues (globalisation and technological advancements) have occurred in tandem and it is hard to differentiate the cause from the effect.

Moreover, technological advancements and innovations such as sophisticated Automatic Radar Plotting Aids (ARPA), Global Positioning System (GPS), Electronic Charts (ECDIS), Unmanned Machinery Space (UMS) engines on the one hand and the introduction of the Internet and Information and Communication Technology (ICT) on the other, have all greatly transformed the way work is experienced on board ships by seafarers (King 2000; Anand 2011). Such technological advancements, together with commercial and economic pressure on ship operators, resulted in the reduction of the manning-scale of the ships and at the same time required changes in the skills needed by seafarers to perform their assigned duties (King 2000). The changes to the workplace and nature of the job of the seafarers in this highly globalised working environment demanded an international set of training provisions to prepare and provide the skilled workforce.

## **2.5 Global Governance and Standardisation**

In 1889 the first international conference regarding safety matters was convened by the United States during which the necessary qualifications for officers and ratings remained one of the main issues on the agenda. Some maritime nations, including Britain and the United States, tried to achieve an agreement. However, that conference succeeded with only one agenda item (the rules for prevention of collision by ships) and despite being on the agenda, no agreement was reached on training and certification of seafarers (Stopford 1992).

According to Cahill (1990) safety has never ranked very high on the scale of priorities of those who own ships. Until the mid-nineteenth century, ship owners and their agents ashore were not liable to criminal penalties for failures of safety at sea (Boisson 1999). The law imposed no criminal liability on the ship owners who failed to manage, refit or equip their ships properly or sent her to sea under-manned (Potter 1992). Ship owners in an industry without any regulations could take almost all decisions without paying any attention to the safety, including training, of crew members.

The start of the regulatory process was indeed initiated by public pressure due to the occurrence of some maritime accidents (Boisson 1999). The ‘Titanic’ disaster in 1912, when more than 1500 people lost their lives due to the collision of the ship with an iceberg, is considered to be the most well-known casualty in maritime history. It was actually the ‘Titanic’ disaster that most changed maritime safety. Although the 1929 International Convention for the Safety Of Life At Sea (SOLAS)<sup>13</sup> took about two decades to be adopted and enacted, it had essentially convened due to the ‘Titanic’ case. This case is likely to influence the drafting of new legislation for many decades to come.

Indeed, maritime safety regulation has, throughout its history, been reactive and motivated by the occurrence of major maritime incidents. While this approach has contributed to improved maritime safety, the process is often regarded as being too slow (Winbow 2005; Sekimizu 2014; Lewin 2015). It involved the participation of different players in different regions who together endeavoured to reach a consensus on some measures aimed at improving maritime safety.

During the period under study, the accident-driven approach was conducted more unilaterally than multilaterally. This state of affairs was going to change, but there were considerable obstacles.

### **2.5.1 Developments of Regulatory Systems**

The regulatory regime for the shipping industry has undergone considerable changes in the areas of safety of life at sea, vessel-source pollution prevention and control, and more recently maritime security to safeguard against global terrorism. The International Maritime Organisation (IMO) is the principal international regulatory body with a global standard-setting mandate, which is confirmed by the 1982 United Nations Convention on the Law of the Sea (UNCLOS). Since its inception, IMO has introduced a considerable number of regulations to the world maritime industry. However, the increase in IMO regulations has not always been successful in the phase of implementation (Winbow 2005).

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<sup>13</sup> SOLAS is one of the IMO’s international maritime conventions which prescribes the minimum safety standards in construction, equipment and operations for ships.

Along with the developments in the maritime industry, specifically in the shipping sector, which were discussed earlier in this chapter, came changes to the nature of the work, workplace structure, configuration of the crew and qualifications required of crew members. This was accompanied by growing global concern about health and safety at sea and environmental pollution. These were the basic reasons driving the International Maritime Organisation (IMO) as a global regulatory body of the maritime industry through which many regulatory conventions were initiated. Moreover, the International Labour Organisation (ILO) took up the role as the international body to improve standards and conditions of work, and to encourage productive and ‘decent employment’ throughout the world (ILO 2006).

IMO and ILO, as two specialised agencies of the UN, have been working in tandem in setting up conventions, codes and recommendations in order to enhance education and training, well-being and health and safety issues of seafarers. While, traditionally, IMO deals with safety and pollution prevention issues of the maritime industry, ILO is the authority for addressing the welfare and labour conditions of the seafarers.

In addition to the IMO and ILO, as the most important global regulatory bodies, there are others who are playing a role in maritime policy-making, although not intervening directly in the regulatory implementation and enforcement process. These include, inter alia, trade unions and a group of non-governmental organisations. The most important of these are considered to be the Baltic and International Maritime Council (BIMCO), International Chamber of Shipping (ICS) and International Shipping Federation (ISF)<sup>14</sup>, as organisations representing ship owners as well as the International Transport Workers’ Federation (ITF).

In order to grasp more about the regulatory systems of the maritime industry it is important to look at the IMO and ILO, as the two main regulatory bodies of the industry, in some detail.

### **2.5.1.1 International Maritime Organisation (IMO)**

The International Maritime Organisation (IMO) was established in 1948. Today the IMO is the most important player in the maritime safety regulation regime with a remit to set standards on a global scale. A large amount of legislation has been adopted by the organisation, first

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<sup>14</sup> ICS and ISF merged in 2011.



affecting maritime safety areas and later the protection of the marine environment and more recently maritime security.

IMO conventions are considered as political agreements between governments of member states to be implemented by contracting governments being parties to the convention. Based on this principal, several international instruments have been adopted by IMO since its inception, some of which are in force. The most important instruments, among others, are considered to be the International Convention for the Safety Of Life At Sea (SOLAS), the International Convention on the Prevention of Pollution from Ships (MARPOL), the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the International Convention on Load Lines (LL).

Presently there are laws for almost all areas of maritime safety and pollution prevention covering all aspects of ship construction, ship operation and the education and training of seafarers. The main problem in complying with the legislation resides not with lack of legislation but lack of implementation and enforcement. IMO has recognised this and in response has established a new sub-committee on flag state implementation (IMO 2015).

#### **2.5.1.2 International Labour Organisation (ILO)**

The International Labour Organisation (ILO) was created in 1919. There were three major factors which motivated governments to establish such an organisation. The initial motivation was humanitarian in view of the fact that workers were exploited with no consideration for their health, family lives or their advancement (ILO 2006). The second motivation was political since it was realised that without considering improvement in the work and life condition of ever-increasing numbers of workers, there would be a potential for social unrest and even revolution. Economic motivation was the third incentive in view of the productivity of the workforce and its relationship to the cost of production (ILO 2006).

Adoption of international labour standards through development of conventions and recommendations, technical cooperation to assist developing nations and an extensive research, training, education, and publications programme are three major tasks of the ILO (ILO 2006). Since its inception, ILO has adopted over 60 maritime labour instruments addressing, inter alia, safety standards, standards of competency of seafarers, hours of work and manning, in order to improve the safety of life on board ships.

ILO developed and adopted the consolidated Maritime Labour Convention (MLC) in February 2006. The new consolidated convention, while setting out seafarer's rights to decent conditions of work on a wide range of subjects, has been designated to be the so-called 'fourth pillar' of the international regulatory regime for quality shipping (ILO 2006). This Convention is supposed to complement the three key conventions of IMO, namely SOLAS, STCW and MARPOL.

## **2.6 The 'Human Element' in Shipping**

From the early regulations adopted by the IMO it is apparent that there has been a significant shift in emphasis from technical matters (e.g. Safety Of Life At Sea and Marine Pollution Conventions) towards operational and management issues and the 'human element' (e.g. STCW Convention and International Safety Management Code). This reflects the industry's recognition of the impact of 'good management' and 'adequate education and training' in improving and achieving maritime safety and marine environmental protection objectives. A summary of official inquiries into shipwrecks and marine casualties shows that, historically, the 'human element' has had a major impact on safety. A pilot study carried out by the Marine Directorate of the UK Department of Transport in 1991, focusses on quantitative aspects of casualties. It shows major human involvement in casualties and underlines the significance of the 'human element' in shipping. More specifically, the study findings reveal that in the root cause of 80 to 90 percent of all accidents, 'human element' is present.

'Human element', 'human factor', and 'human error' are popular phrases used in shipping literature. While they have different meanings, they are sometimes used interchangeably (Liu 2001). Rothblum (2000, p. 2) describes human error as, "An incorrect decision, an improperly performed action or an improper lack of action/inaction". IMO (2000) defines it as, 'A departure from acceptable or desirable practice on the part of an individual or group of individuals that can result in unacceptable or undesirable results.' There are various definitions for this term in the literature. However, they all convey the meaning that 'human error' is the failure of planned human performance. According to Liu (2001), human beings are treated as a component of a larger system. The term 'human element' may therefore be used to refer to human beings' functions and performances in the system with human error as only an example of the human elements' failure in the system. Rothblum (2000, p. 3), describes how performance can be affected not only by a person's natural, innate characteristics (such as

knowledge, skills, abilities, memory, motivation and alertness) but also by external elements such as technology, the environment and organisational factors. Interaction with these external factors can affect human capabilities including perception, comprehension, decision-making, safety, physical and mental performance, fatigue, risk-taking and teamwork.

A study undertaken by Clench (1995) identifies training, workload, fatigue, manning, selection, language, management and knowledge as the main human elements in the maritime system.

Squire (2010, p. 1) states that:

Too often, the term ‘human error’ is cited as the cause of an accident; in some cases, it may be correct to say that the immediate cause was through ‘operator error’, but when looking to the root cause, that ‘human error’ may well have started at the procurement or chartering stage if little consideration has been given to ensuring that the ship and its crew are really ‘fit for purpose’ or, indeed, whether that ship is ‘fit for the crew’.

The terms ‘human element’ and ‘human factor’, are used in the literature synonymously. IMO (1997) interprets the meaning of the term ‘human element’ as a complex multidimensional issue that affects maritime safety and marine environmental protection and it involves the entire spectrum of human activities performed by a ship’s crew and the other stakeholders of the industry.

It is the human element on board ship that can either provide the skills that may prevent a disaster, or plain lack of competence that can cause one (MPT 2016). While technological capability continues to develop at an increasingly fast rate, the human component in any process will always be necessary, with both its benefits and its drawbacks (Eyerdam 2015). That is why the international maritime community has now shifted from an approach which traditionally sought technical solutions to safety-related problems and is focusing instead on the role of human factors in maritime safety (Forward 2004; Er and Celik 2005).

The purpose of Maritime Education and Training (MET) is to train and supply competent seafarers, as the main component of the human element, for the shipping industry (Demirel and Mehta 2009). In the next section the evolution of MET and the STCW Convention is presented, together with the industry stakeholders’ perceptions on their efficacy.

## **2.7 Maritime Education and Training: Importance and Evolution**

In order to study the evolution of the maritime education and training it is important to understand its history. Kennerley (2002) points out that among the different aspects of maritime history, the study of seafarers' education and social welfare are the most neglected and least documented. This is what I also experienced in the course of this research. It became evident to me that, compared with the wealth of research in the areas of the market, economy and technical aspects of ship construction and equipment, there is only a small amount of academic research in the area of seafarers' training. There are, however, quite a number of industry periodicals, magazines, newspapers, professional meeting reports and a wealth of anecdotes which, for the purpose of this research, will be referred to as 'grey literature'. Moreover, there are also official documents with regard to education and training which can be accessed in the industry's leading organisations.

The safe and efficient operation of any ship, among other technical factors, depends primarily on a well-educated, trained and competent crew (Lewin 2015). Kennerley (2002, p. 3) states that, "Seafaring was, and perhaps still is, essentially an occupation where performance depended heavily on experience". For centuries, seafarers learned their trade by going to sea. They began as young apprentices and learned on the job by being trained by their elders and trying to do what they were told. In time, they picked up enough knowledge to become competent seafarers in their turn (Kennerly 2002; Le Goubin 2010; Emad 2011). By the nineteenth century, training had become more formalised and many seafarers commenced their apprenticeships by spending some time at training establishments ashore (Kennerly 2002). These training establishments were sometimes operated by governments, occasionally by the industry and sometimes by individual shipping companies. However, by the second half of the twentieth century, new issues and concerns about the traditional education and training of the seafarers had emerged and been recognized by the industry stakeholders. The shipping world had become more international than ever and there was concern that standards in some merchant marines were not as high as they should be (Kennerly 2002).

The considerable developments in the shipping industry that took place in the last four decades of the past century significantly affected the maritime education and training of seafarers (Fuazudeen 2008a). These years saw great strides in different aspects of shipping technology with the variety of special purpose ships, the birth of enormous size ships, the introduction of

numerous electronic aids and systems and the increased trend towards automation. All these factors initiated the need to review the traditional system of maritime education and training and to try to cope with these developed systems and techniques. Lewin (2015, p. 1) states that:

In the maritime industry, on the job (OJB) training was the norm ... when young cadets received all their training and assessment on-board in the British Navy. However, this changed when formal requirements were introduced in the 20th century following major maritime accidents such as the Titanic, compulsory schooling, and especially technological innovations revolutionized the maritime sector (container shipping, ECDIS<sup>15</sup> and AIS<sup>16</sup>, etc.). There was first a transition from on the job training to the classroom.

The issue of technological change and its implications for the seagoing workforce was predicted and examined within a study carried out in 1974 by the Panel on Human Resources in the U.S. maritime industry of the National Research Council. The panel's report addressed how technological advancements would affect various aspects of the seafaring workforce and amongst the anticipated changes was the need for seafarers to develop new, more sophisticated skills (National Research Council 1974). The report foresaw that the nature of ships and work aboard ship was changing and would continue to be reformed through advances in technology. New types of ships would entail changes in size, equipment and tasks that affect crew size, crew roles, crew relationships and crew performance. Less than a decade from the dissemination of this report the emergence of globalisation intensified the situation and the need for a workforce with new skills who could work in a new social setting was found to be imminent. The effects of the changes to the shipping industry, especially changes to the shipping labour force, became more conspicuous. This was the time when the major de-regulations and re-regulations of the shipping industry took place (Lane 1997). The policy makers were urged to review the training systems according to the new shipping needs and the demanded work skills. The outcome of the international-scale changes could also be traced through the modifications in the MET system by the introduction of the STCW Convention and its subsequent amendments and major revisions during four decades to date.

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<sup>15</sup> Electronic Chart Display and Information System (ECDIS) is a geographic information system used for nautical navigation that is used on-board ships as an alternative to paper nautical charts.

<sup>16</sup> Automatic Identification System (AIS) is an automatic tracking system used for collision avoidance on ships.

In 1980, a message was addressed by the Secretary General of the Inter-governmental Maritime Organisation (IMCO), now known as IMO, on the occasion of the World Maritime Day. The theme of this message was 'Maritime Training for Safer Shipping and Cleaner Oceans'. In 2002, IMO acknowledged its changing priorities by endorsing a new mission statement, an evolution from the then theme to 'Safe, Secure and Efficient Shipping on Clean Oceans'. Through implementation of the STCW Convention provisions within the MET system, the IMO aimed to provide an efficient workforce who could achieve the goals set in the mission statement.

Contemporary analyses of maritime accidents show that more than 80 percent are attributed to human errors as noted above (Goulielmos 1997; Baker and Seah 2004; IMO 2005; Emad 2011), despite the fact that ships are equipped with highly developed machinery and navigational aids. If it is intended to reduce the number of marine casualties and accidents to a minimum, then the proper education and training of seafarers is viewed as vital (IAMU 2014).

### **2.7.1 The Nature of Maritime Education and Training and its Objectives**

Maritime Education and Training (MET) is considered as technical education and training for the professional workforce in the maritime industry. According to Dong (2014, p. 115):

Traditionally, people defined Maritime Education and Training (MET) as an educational system which aimed to provide seafarers for merchant vessels, however, with the development of the shipping industry, it is necessary to redefine the conception of MET from a broader perspective to cover more aspects such as maritime finance, maritime security, as well as some rare maritime disciplines in shipping markets.

In the current MET system, programmes of training and study are provided for both sea-based and shore-based personnel to enable them to advance to higher ranks or pass competency exams. The main objectives of the system are therefore to train cadets to progress to the rank of ships' officer and ratings to work as seamen, to enable ships' officers to pass the higher CoC, to provide specialised short courses for seafarers, to train shore-based staff for management and executive roles and also to provide training to port labourers. This research is primarily concerned with the education and training of the ship officers and officer cadets.

## **2.7.2 Who Needs Training On Board?**

Shipboard handling and operations demand skilful practitioners and involve a universally recognised hierarchy and certification system (see Appendix 1: A Typical Shipboard Organisation Chart). There are three departments on board ships, i.e. deck, engine and catering departments. The labour division principally includes ‘officers’ and ‘ratings’. Based on the officers’ role, they mainly work either in the ‘deck’ or ‘engine department’. The Master of the ship (Captain) is in overall charge of the vessel and takes steps to reach this position from the deck department.

Principally, all seafarers need to undergo training prior to being deployed for shipboard tasks. The STCW Convention prescribes specific and detailed training for all individuals.

## **2.7.3 Education and Training of Officers**

In order to become an officer, the trainee should undergo diverse basic and specialised training, acquire a specific amount of knowledge and skills and be considered ‘competent’ to perform his/her assigned duties on board ship. Competencies are mainly acquired through a combination of college-based education and training plus practical experience on board ship (IMO 1996; Gould 2010). College-based curricula mainly comprise classroom-based theoretical education, and simulator and workshop training for practical skills. Shipboard training is the time the candidates spend in the actual workplace to develop their skills. For the first CoC the officer cadets carry a training record book<sup>17</sup> and the shipboard officers are supposed to train them accordingly and attest that the training requirements are fulfilled.

The duration of training varies for different types of qualification in different countries. To give a general idea, typically an officer cadet in the current UK deck officer training scheme undergoes five phases of sandwich training (college-based and on board ship) for a duration of about 150 weeks.

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<sup>17</sup> The training record book is a portfolio that specifies the on-board training requirements of the officer cadets, as specified in STCW Convention.

The qualifications of those responsible for the training and assessment of the candidates are also addressed in Regulation I/6 of the STCW Convention (IMO 2011, p. 28).

The education and training system of the officers and officer cadets was traditionally based on the apprenticeship model. By the introduction of the STCW 78 Convention, the MET of the seafarers changed to a dominantly ‘knowledge-based’ system and later, by the introduction of STCW 95, it was transformed to a Competency Based Training (CBT) model.

#### **2.7.4 Assessment and Certification**

One of the main features of MET is the system of examination and certification of seafarers. Upon completion of training, candidates should be able to demonstrate the competencies required in the Convention through an appropriate examination and assessment procedure. If successful, they will then be awarded a Certificate of Competency (CoC), which is the licence to work on board ship.

The role of maritime institutes is limited to the preparation of candidates for examinations and the official authorities (mainly maritime administrations) in each country are entitled to conduct these examinations and to issue the various CoCs. Legislations govern these tasks totally, name the different subjects, their contents, and prescribe the standard required for each CoC.

Although it is not always the case that these official authorities carry out the examination procedures, they must issue the CoC (IMO 1996). In some countries, the role of conducting the examination procedure is delegated to one or more of the maritime institutes in the country. The result of these examinations must be recognised by the government authorities (the examination sections of the maritime administrations) before the CoCs are issued by the governmental authority. IMO holds the maritime administration of each country accountable for implementation of the training standards as well as the certification system.

#### **2.7.5 ‘Competence’ and ‘Competency Based Training’**

The current STCW Convention is designed on a competency-based model of training. In this system, the training objectives are set, based on specific competencies. Trainees are subject to specific assessments to demonstrate the required competence is acquired.



Literature shows there are proponents (Harris et al. 1995) and opponents (Hyland 1994) of the CBT system. The idea of this research is not to scrutinise the advocates and sceptics of the CBT system. However, since this is the basis of the STCW requirements, I will briefly look at the literature to provide a clear understanding of the concept.

In a literature review carried out by Guthrie (2009) about ‘competence’ and ‘competency based training’ he states that, “On the surface, ‘competence’ seems to be a simple concept...that simplicity melts away to reveal something which is conceptually far more complex” (p. 18). According to the training package development handbook for units of competency (DEEWR<sup>18</sup> 2007, cited in Guthrie 2009, p. 18), competency is defined as:

...the ability to perform particular tasks and duties to the standard of performance expected in the workplace. Competency requires the application of specified skills, knowledge and attitudes relevant to effective participation in an industry, industry sector or enterprise. It covers all aspects of workplace performance and involves performing individual tasks; managing a range of different tasks; responding to contingencies or breakdowns; and, dealing with the responsibilities of the workplace, including working with others. Competency requires the ability to apply relevant skills, knowledge and attitudes consistently over time, and in the required workplace situations and environments.

Schofield and McDonald (2004) claim that competence has a broader concept than just the ability to perform job-related tasks. According to Guthrie (2009), “Competency Based Training (CBT) often stresses work performance, and the outcomes of that which are observable, measurable and assessable” (p. 18). However, according to Schofield and McDonald (2004, p. 16) “performance is underpinned by the constituents of competence: personally held skills, knowledge and abilities which collectively underpin and enable performance.”

It is worth mentioning that some researchers within the industry are sceptical (eg. Alop 2004) about the success of the CBT method of MET. Alop (2004) claims that years since the introduction of CBT, the role of the human element in accidents continues to be high. It is also

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<sup>18</sup> Department of Education, Employment and Workplace Relations

claimed that the use of the core concept of competence is not appropriately established within the STCW Convention (see Abila 2016).

This issue is examined further in section 2.9 of this chapter. In the next section, the regulatory system pertaining to the education and training of the seafarers is examined.

## **2.8 International Regulations Regarding Maritime Education and Training**

Maritime education, training and certification is one of the components of maritime safety. The first major act of the IMO (then known as IMCO) was to convene the International Conference on the Safety of Life at Sea in 1960. One of the resolutions adopted in that conference called upon governments to take all practicable steps to ensure the education and training of seafarers. It was also recommended that IMO and ILO co-operate with each other and with interested governments in achieving these goals (IMO 1997).

A joint committee on training, comprising the governing body of ILO and the Maritime Safety Committee (MSC) of IMO was established in response to this recommendation. The first output of the joint committee was a Document for Guidance that was published in 1964. This Document provided guidance on the education and training of masters, officers and ratings in the use and operation of aids to navigation, life-saving appliances, devices for the prevention, detection and extinction of fires, and other ship's equipment contributing to safety at sea (IMO 1997).

The Document was subsequently amended and supplemented three times by the Joint Committee, in 1975, 1977 and 1985. Despite the success of this Document, in 1971 the IMO Council decided that still further measures were needed to strengthen and improve standards and gave urgent consideration to convening a conference to adopt a convention on international standards of watchkeeping, training and certification of seafarers (IMO 1997). At that time, individual maritime administrations of the individual countries, mainly the TMNs had their own specified and established standards of training, certification and watchkeeping of officers and ratings. Usually these standards were unilateral, without reference to practices in other countries. As a result, standards and procedures varied widely across the nations. (IMO 2006)

Preparatory work was carried out by the IMO Sub-Committee on Standards of Training and Watchkeeping, which prepared the text of a draft convention, an annex containing requirements for watchkeeping, training and certification and a number of draft recommendations. However, only in 1978 was an instrument regulating this area adopted at an international level: The International Convention on Standards of Training Certification and Watchkeeping for Seafarers, STCW 1978 (UN 2006).

### **2.8.1 The 1978 STCW Convention**

The Convention prescribes minimum standards for education, training and certification of the seafarers, which countries are obliged to meet (IMO 1997). The Convention entered into force on 28 April 1984 and was accepted by 144 states with fleets aggregating 98.45 percent of the world merchant shipping tonnage (IMO 2006). When the Convention entered into force, it was expected that its requirements would ensure the competence of masters, officers and ratings of all seagoing ships and their safe operation through efficient watchkeeping. “As with all IMO Conventions it reflected the highest practicable standards which could be globally agreed at the time of its adoption” (IMO 2000, p. 27).

### **2.8.2 Contents of the STCW 1978 Convention**

The STCW 1978 Convention consists of six chapters and 23 resolutions, which specify training provisions mainly for officers and ratings of deck, engine and radio departments (IMCO 1978).

The chapter for the deck department establishes the basic principles to be observed in keeping a navigational watch, covering such matters as watch arrangements, fitness for duty, navigation, navigational equipment, navigational duties and responsibilities, duties of the lookout, navigation with a pilot on board and protection of the marine environment. It states that candidates must also have passed an appropriate examination covering not only navigational aspects and ship-handling but ship stability, construction and damage control, power plants, cargo handling and stowage, fire prevention, medical care, maritime law (including requirements of the SOLAS and other IMO Conventions), personnel management and training, communications, life-saving, search and rescue, and methods for demonstrating proficiency.

The chapter for the engine department follows a similar format to that of the deck department and begins with a regulation that outlines the basic principles to be observed in keeping an engineering watch. While requirements for deck officers vary according to the tonnage of the ship, for engineer officers the determining factor is the power of the engine.

An explanatory note points out that mandatory provisions relating to radio watchkeeping are set out in the ITU Radio Regulations and safety radio watchkeeping and maintenance provisions are included in the same regulations and in the SOLAS Convention.

In the Convention there are special requirements for tankers. Its intention is to ensure that officers and ratings who have specific duties related to the cargo and cargo equipment of tankers shall have completed an appropriate shore-based fire-fighting course, and have completed either an appropriate period of shipboard service or an approved familiarisation course.

In addition to the main provisions of the Convention, there are some resolutions adopted by the 1978 Conference (STCW 1978 Resolutions). Resolutions are designed to back up the Convention itself. They are recommendatory rather than mandatory and incorporate more details than some of the Convention regulations (STCW 78).

### **2.8.3 Shortcomings of the STCW 1978**

The STCW 1978 Convention was adopted to ensure the competence of masters, officers and ratings of all seagoing ships. However, despite its broad global acceptance, it was realised by the late 1980s that the Convention was not achieving its purpose (Lewarn 2002; IMO 2006; Emad 2011; Ghosh et al. 2014). Instead, it was gradually losing credibility. The main cause for this appeared to be the general lack of precision in its standards, the interpretation of which was left "to the satisfaction of the Administration" (IMO 1997). The Convention had prescribed minimum periods of seagoing or other appropriate service and specified 'knowledge' requirements without defining the 'skills' and 'competence' required (Lewarn 2002; Emad and Roth 2008; Emad 2011). This resulted in widely varying interpretations of standards and many countries failed to effectively administer and enforce Convention requirements. Therefore, STCW certificates could no longer be relied upon as evidence of competence (IMO 1997).

Moreover, as the result of globalisation and technological advancements (see Chapter Two) the traditional organisation of duties and responsibilities on board ship was also changing. Within the industry, the need for greater flexibility in the training and certification of seafarers became a significant force in the demand for change.

The 1978 Convention represented an important milestone in maritime regulation and in maritime training. It organised technical standards for seafarers for the first time globally (IMO 1997). However, it also created an awareness of the very different systems of maritime education across the world, as they are dependent, to a large extent, on historical influences and the educational systems in different countries (Lane 2002).

Despite its broad global acceptance, (by 1st July 1995 the Convention was accepted or ratified by 113 countries, thereby covering 94.6 percent of world tonnage), it was realised in the late 1980s that the Convention was not achieving its purpose (Chapman 1997; Vanchiswar 1997).

Lewarn (2002, p. 22) states:

STCW 78 focused on what seafarers needed to know to be deemed competent. Courses tended to be academic in nature, classroom based, teacher centred, with assessment based around formal written exams... it failed for a number of reasons, one of which was that, in an educational sense, it loosely described what a seafarer had to know to be deemed competent. Knowing something and doing something are two different things - I know the theory of ship handling but that does not mean I can actually handle a ship. The test for knowledge alone can be separate from the test for doing (competence) but the test for doing (competence), by default, incorporates the test for knowledge.

The STCW sub-committee working groups that prepared the 1978 drafts therefore had to go back to the first principles and, in doing so, established the fundamental concepts that form the basis of the amended Convention.

#### **2.8.4. The 1995 STCW Convention**

The growing criticism of the training standards of the seafarers and worldwide political and public concerns regarding shipping casualties not only undermined the credibility of the Convention itself but also reproached the IMO (IMO 1997). Therefore, the STCW 78

Convention was revised by the IMO in the 1990s in response to the criticism of its shortcomings. According to the information disseminated by the IMO (1997, p. 4), the main aims of the revision were:

- 1) to transfer all detailed technical requirements to an associated Code;
- 2) to clarify the skills and competence required;
- 3) to require Administrations to maintain direct control over and endorse the qualifications of those masters, officers and radio personnel they authorize to serve on their ships;
- 4) to make Parties to the Convention accountable to each other, through IMO, for their proper implementation of the Convention and the quality of their training and certification activities; and,
- 5) to have the amendments enter into force for all Parties to the Convention with the least possible delay.

Amendments to the STCW Convention entered into force in February 1997 but it took until February 2002 for the STCW 95 Convention to become fully enforced.

### **2.8.5 Structure and Contents of the STCW 1995 Convention**

The STCW Convention (IMO 2001) comprises several ‘articles’ and sets of ‘regulations’ and a ‘Code’. The new feature of the revision is the adoption of a new STCW Code, to which many technical regulations of the Convention have been transferred. The Code consists of two parts. Part A of the Code comprises mandatory requirements while Part B contains recommended guidelines that are not mandatory.

In eight chapters of the Convention, the following provisions are addressed:

Chapter I of the convention is the general provisions.

Chapter II is regulations for the master and deck department.

Chapter III is the provisions for the engine department.

Chapter IV comprises the provisions for radio-communication and radio personnel.

Chapter V specifies the special training requirements for personnel on certain types of ships, e.g. ro-ro passenger ships<sup>19</sup> and tankers.

Chapter VI contains provisions for emergency, occupational safety, medical care and survival functions.

Chapter VII specifies regulations regarding alternative certification and equivalent education and training arrangements.

Chapter VIII contains measures that have been introduced for Watchkeeping personnel to prevent fatigue.

The regulations contained in the Convention are supported by the STCW Code. The code contains the minimum standards of competence required for seagoing personnel in a tabular format. Each table in four columns identifies the 'competence', 'knowledge, understanding and proficiency', 'methods for demonstrating competence', and 'criteria for evaluating competence'. The following is a sample of the competence tables.

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<sup>19</sup> Roll-on/Roll-off passenger ships are capable of carrying passenger and wheeled cargos e.g. cars, trucks.

**Figure 2.3 Sample Competence Table of STCW 2010 (Table A-11/2)**

Source: IMO 2011 (p.112)

Specification of minimum standard of competence for masters and chief mates on ships of 500 gross tonnage or more.

**Function: Navigation at the management level.**

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Plan a voyage and conduct navigation	<p>Voyage planning and navigation for all conditions by acceptable methods of plotting ocean tracks, taking into account, e.g.:</p> <ul style="list-style-type: none"> <li>.1 restricted waters</li> <li>.2 meteorological conditions</li> <li>.3 ice</li> <li>.4 restricted visibility</li> <li>.5 traffic separation schemes</li> <li>.6 vessel traffic service (VTS) areas</li> <li>.7 areas of extensive tidal effects</li> </ul> <p>Routeing in accordance with the General Provisions on Ships' Routeing</p> <p>Reporting in accordance with the General principles for Ship Reporting Systems and with VTS procedures</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved simulator training, where appropriate</li> <li>.3 approved laboratory equipment training</li> </ul> <p>using: chart catalogues, charts, nautical publications and ship particulars</p>	<p>The equipment, charts and nautical publications required for the voyage are enumerated and appropriate to the safe conduct of the voyage</p> <p>The reasons for the planned route are supported by facts and statistical data obtained from relevant sources and publications</p> <p>Positions, courses, distances and time calculations are correct within accepted accuracy standards for navigational equipment</p> <p>All potential navigational hazards are accurately identified</p>
Determine position and the accuracy of resultant position fix by and means	<p>Position determination in all conditions:</p> <ul style="list-style-type: none"> <li>.1 by celestial observations</li> <li>.2 by terrestrial observations, including the ability to use appropriate charts, notices to mariners and other publications to assess the accuracy of the resulting position fix</li> <li>.3 using modern electronic navigational aids, with specific knowledge of their operating principles, limitations, sources of error, detection of misrepresentation of information and methods of correction to obtain accurate position fixing</li> </ul>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved simulator training, where appropriate</li> <li>.3 approved laboratory equipment training using: <ul style="list-style-type: none"> <li>.3.1 charts, nautical almanac, plotting sheets, chronometer, sextant and a calculator</li> <li>.3.2 charts, nautical publications and navigational instruments (azimuth mirror, sextant, log, sounding equipment, compass) and manufacturers' manuals</li> <li>.3.3 radar, terrestrial electronic position-fixing systems, satellite navigation systems and appropriate nautical charts and publications</li> </ul> </li> </ul>	<p>The primary method chosen for fixing the ship's position is the most appropriate to the prevailing circumstances and conditions</p> <p>The fix obtained by celestial observations is within accepted accuracy levels</p> <p>The fix obtained by terrestrial observations is within accepted accuracy levels</p> <p>The accuracy of the resulting fix is properly assessed</p> <p>The fix obtained by the use of electronic navigational aids is within the accuracy standards of the systems in use. The possible errors affecting the accuracy of the resulting position are stated and methods of minimizing the effects of system errors on the resulting position are properly applied</p>



As a new approach to the training of the seafarers, in the revision process, IMO structured the revised Convention to be outcome-based by adopting the CBT method. It requires the candidates to demonstrate their ability to perform defined tasks. It is supposed that the applicants for the CoC demonstrate that they are able to ‘do’ what they are trained to do (Hardin 2000).

With the introduction of the STCW 95 Convention and changing structure of the training to CBT, the replacement of the minimum requirement for the on-board training of seafarers became legitimate and use of simulators and workshops in place of the on-board practical training was introduced (STCW 1995).

### **2.8.6 Shortcomings of the STCW 1995 - Introduction of the STCW 2010**

The STCW 95 Convention was in place for more than a decade, during which time it was amended several times. With ever-increasing technological advancements, the introduction of new changes to the on-board organisational structures (e.g. the introduction of electro-technical officers<sup>20</sup> on board ships) the industry urged the IMO to take appropriate action to address the shortcomings of the Convention. There were some other issues, such as the new safety and environmental policies, which also needed to be addressed in the education and training provisions of the seafarers. In 2006, the IMO took preliminary actions to undertake a comprehensive revision of the STCW 95 Code. This resulted in the STCW 2010, Manila amendments.

Examining the policy documents of IMO indicates that the following are among the main changes to the STCW 95 Convention and Code:

- 1) New training guidance for officers and ratings.
- 2) New training requirements for ‘leadership’ and ‘teamwork’.

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<sup>20</sup> Electro-Technical Officers are in charge of all the electrical and electronic systems on board ships. Although this rank was introduced on board ships almost two decades ago, their training standard was not introduced until the latest revision of the STCW Convention 2010. Electro-Technical Officers replaced the position of Electrical Officers, mostly known as electricians on board ships. The changes to the position were in response to the industry’s requirement for experts who could deal with the increasing amount of electronic equipment on board ships.

- 3) New measures to avoid ‘fatigue’ through modifications to the ‘minimum rest hours’ of seafarers on board.
- 4) Introduction of new training requirements of electro-technical officers.
- 5) Increasing the shipboard training requirements of the engine department cadets.
- 6) Changes to the ‘drugs and alcohol policy’ and medical examination of seafarers.
- 7) Introduction of the Able Seaman training requirements and certificate of competency (in harmony with the ILO requirements for Able Seaman).
- 8) New training requirements for Electronic Chart Display and Information System (ECDIS).
- 9) New competency requirements for seafarers serving on board oil tankers, gas carriers, chemical carriers, ships operating in polar waters and ships with dynamic positioning systems.

Whereas the STCW 78 Convention focused almost entirely on knowledge, the emphasis of STCW 95 shifted to practical skills and competence, underpinned by theoretical knowledge. The 2010 amendments continued to emphasise ‘competence’ rather than sea service or period of training.

As it can be seen from the evolution of the STCW Convention through almost half a century, the IMO has been trying to update the Convention in response to the changing requirements of the industry. However, the literature shows that there have been significant concerns about the content, implementation, effectiveness and time taken by the IMO to make amendments. In the next section, I will examine the literature for the industry’s reflections on the STCW Convention’s effectiveness, the MET system and the skills and competency of the officers.

## **2.9 Industry’s Perception Regarding MET and STCW - Literature**

While there is an abundance of literature on the technical aspects of the industry such as shipbuilding, machinery and equipment, there is comparatively little academic research available on the education and training of seafarers. Therefore, for the purpose of this research,

I refer to a handful of research studies and projects carried out within the industry as well as the information available in the industry's documents and periodicals. In research conducted by Lewin (2015, p. 2) regarding 'Training Effectiveness in Maritime Transport', he states that: "There is a paucity of research on the effectiveness of training on safety in the maritime industry."

One of the early pieces of research carried out after implementation of the STCW 95 Convention was the 'Harmonisation of European Maritime Education and Training Schemes' (METHAR). The main objectives of METHAR (Zade 2000) were to contribute to the development of harmonised syllabuses and their implementation, identify needs for the adaptation of MET programmes to the requirements of the maritime industry, provide better understanding of the, by then, new STCW 95 Convention, and suggest a harmonised approach to better meet its requirements. This project was initiated since it was noted that objectives, systems, schemes, concepts and training methods of MET varied considerably among Member States of the European Union. The project commenced in 1996 and took about four years.

The METHAR project was mainly convened to increase the competitiveness of the European maritime industry but it is noticeable that the European shipping industry perceived that there were inconsistencies in the implementation of the STCW Convention by the nation states which needed to be addressed. One of the significant recommendations of the METHAR project suggests that, "More on-board training places should be made available by ship owners/ship operators so that MET students can complete their training for a certificate of competency" (p. 50).

A similar project convened by the European Commission – DG Energy and Transport between 2000 and 2003 was 'The Thematic Network on Maritime Education, Training and Mobility of Seafarers (METNET)'. The three main objectives of METNET were "to improve the quality, harmonize the contents and extend the applicability of Maritime Education and Training (MET) for ship officers in the EU" (Schröder et al. 2004, p. 1). Meeting these objectives was seen as a way of improving competitiveness, employment opportunities, mobility, safety, efficiency and environmental concerns and increasing the supply of labour in European shipping (Schröder et al. 2004).

In his doctoral thesis on implementation of STCW 95 in the context of a safety culture in shipping, Leca Da Veiga (2001) highlights the importance of adoption of a 'quality assurance'

mechanism in the MET system for harmonising the implementation of the STCW Convention. The quality assurance is now embedded in the Convention and MET institutions and the maritime administrations of the countries need to incorporate such a system or equivalent in their systems and periodically provide an independent audit report to the IMO in fulfilment of the Convention requirements.

Relatively recent research by Emad (2011) which looks at the assessment system of seafarers as one of the main elements of the MET, identifies contradictions in the education and training system which, he claims, prevent its objectives from being met. Emad's study reveals that instead of testing whether students have acquired sufficient skills and knowledge to carry out their job in the workplace (described as being 'authentically competent'), the aim of the system is to ensure they can pass competency examinations. He states that "practitioners obtaining certification contributes to the belief that they are competent when no (little) evidence has been gathered as to whether this belief is justified and therefore constitutes factual knowledge (Emad 2011, p. 70). Emad recommends changes to the assessment system, proposing that the IMO and certification authorities should "do more than just prepare guidelines that reinforce the current practice...[and should] establish performance standards for competency certification. These standards have to be detailed and clearly defined so that the students and the trainers know exactly what is expected from them and assessors know what is to be assessed and how." (2011, pp. 70-71).

As explained earlier in this chapter, the STCW Convention is structured on a competency-based training model. According to Harris et al. (1995), cited in Emad (2011, p. 58):

Competency-based education is perceived by some as the answer, by others as the wrong answer, to the improvement of education and training for the complex contemporary world. Proponents of CBT promote it as a way to improve the correspondence between education/training and workplace requirements.

Wolf (1995), in advocating CBT, suggests that CBT provides clear objectives and therefore measuring the effectiveness of the training can be better achieved. In opposing CBT, Hager (2004) suggests that CBT does not successfully integrate learning and human action. From Hager's perspective, it is thought to be reductionist, narrow and theoretically, empirically and pedagogically unsound. Hyland (1994, p. 336) describes it as, "largely unsuitable for the

teaching and learning which goes on in higher education institutions, whether this occurs in general/academic or professional/vocational contexts”.

Alop (2004) claims that after years of implementation of the STCW 95 Convention, even though the proposed CBT system aimed to improve competencies, the number of accidents attributed to the human element remains significant (Alop, 2004).

Literature shows that one of the significant changes to the training system of seafarers was a drastic reduction of the on-board training requirement for the Certificate of Competency candidates, brought about by the STCW 95 Convention and justified in the Convention by its replacement by simulator training. Prior to the introduction of the STCW 95 Convention, the minimum requirement for on-board training (so-called ‘sea-service’ in the STCW 78 convention) for deck candidates was about 30 months<sup>21</sup>. This time is now reduced to 12 months and 6 months for deck and engine candidates respectively. In the revised STCW 2010 Convention, this duration is increased to 12 months for engine cadets. However, literature shows significant scepticism about these changes. As an example, research conducted by Bailey et al. (2006) under the title of ‘Navigation, interaction and bridge team work’ states:

...experience suggests that little attention is paid to the practicalities of communicating in noisy spacious environments or the practical accomplishment of decision-making through talk-in-interaction. Indeed simulators tend to be small and quiet with the participants a few feet apart and with the programmes utilised requiring little dynamic interaction between members. And with the current worldwide shortage of qualified officers simulators are being increasingly used to reduce the time spent on ships during the training period (p. 359).

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<sup>21</sup> There are provisions for on-board training of officers in the STCW 78 Convention (Regulations II/4 and III/4 for deck and engine officers respectively). For example, it requires "36 months of approved sea-going service in the deck department of not less than three years which shall include at least six months of bridge watchkeeping duties under the supervision of a qualified officer; however, an Administration may allow the substitution of a period of special training for not more than two years of this approved sea-going service, provided the Administration is satisfied that such training is at least equivalent in value to the period of sea-going service it replaces (Regulation II/4, 2.C)." This was a grey area open ‘to the satisfaction of the Administration’ of the countries and duration of on-board training differed in countries. Hence, the average figure (about 30 months) presented in this study is obtained from an archived document of the training institutes, information received from one of the Maritime Administrations as well as information acquired from senior seafarers whose training was based on STCW 78 Convention (IMCO 1978).

In research conducted by Prasad et al. (2011), under title of ‘Collaborative Learning for Professional Development of Shipboard Engineers’, the authors advocate group-based learning methods as a means of developing professional knowledge and personal qualities such as learning skills, cooperation and teamwork, among marine engineers. They claim that the MET system fails to foster such qualities, providing only “specified generic engineering and seamanship knowledge with some basic skills to perform tasks on-board”. This limitation is attributed to the lack of uniformity in MET standards, the MET training methods and the assessment procedures. The authors also point out the advantages of ship-specific training as machinery and equipment varies from ship to ship.

Lewarn (2002, p. 22) claims that the STCW 78 Convention failed because “knowing something and doing something are two different things.” However, noting what was found in the literature, especially the scepticism about the CBT training model of the STCW 95 and 2010 Conventions, as well as considering the reduced training time on board ships, the question remains whether the contemporary STCW Convention is achieving its goals.

The documentary review carried out for the purpose of this research (details of which are given in section 4.6.2) revealed that despite the introduction and implementation of the STCW Convention for almost half a century, there is a significant variance within the MET system of the countries included in this research. These discrepancies are prominent in the areas of curricula, training facilities, simulators (duration and quality), and practical training.

So far in this chapter, I have looked at the literature on how seafarers traditionally developed their skills through observation and practice and how, in the wake of globalisation, technological advancement and evolution of the STCW Convention, the apprenticeship model of learning has been largely replaced by a combination of classroom-based and drastically reduced on-board training. In the next chapter I will examine some relevant learning theories, and study the application of these theories in shipping and examples from the health<sup>22</sup> industry.

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<sup>22</sup> There are close similarities in the education pattern of the shipping and health industries in the sense of adaptation of ‘apprenticeship’ models of training and the application of experiential learning theories in training.

## 2.10 Summary

This chapter describes how economic globalisation resulted in changes in the organisation of the shipping industry. In this process, the shipping companies, in order to stay competitive, moved their ships from their national flag to FOC countries. Under FOC, ship owners took advantage of using cheap labour, mainly trained in under-resourced training systems within the newly-emerged labour supplying countries. This issue had a significant effect on the quality of the education and training of the shipping industry's labour force, especially the merchant ship officers.

It was explained that technological advancements in shipbuilding and equipment during the past couple of decades was another prominent factor in changing the context of the workplace and demanded changes to the education and training and skills development of the merchant ship officers.

The changes that took place in shipping highlighted the need for global governance and standardisation of regulations in the industry. In this process the IMO and ILO played important roles in the development and implementation of the international regulations in order to address the industry's need.

The chapter then highlights the role of the 'human element' and the need for the industry to train a competent workforce to ensure the safe operation of its ships. The safety of all ships operating on the high seas is a matter of global concern and the safe and efficient operation of any ship profoundly depends on a skilled and competent workforce (Lewin 2015). In this chapter, literature pertaining to the MET of merchant ship officers has been examined and how and why the STCW Convention was introduced to the industry and its subsequent evolution have also been scrutinised.

Merchant ship officers need to undergo diverse training and obtain necessary knowledge and skills in order to be able to perform their assigned duties on board ship. The literature shows that these skills were traditionally obtained on board ship via an apprenticeship model of training: from master to novice. The traditional apprenticeship training model has now been replaced by a CBT model that includes a combination of college-based education and training plus practical experience on board ship (IMO 1996; IMO 2011). It is evident within the literature that with the introduction of the STCW Convention, the duration of the on-board

training has been radically reduced compared to four decades ago, being partially replaced by simulator and workshop training. There is scepticism and concern within the industry whether the STCW competency-based model of training introduced by the STCW 95 Convention has been successful (Alop 2004).

The literature review describes how some scholars have conducted research into the MET system and the STCW Convention's shortcomings. Their findings show that despite the allocation of a huge amount of collective energy to revise the policies, there remains great concern within the industry about the skills and competency of the merchant officers. (Zade 2000; Sampson 2003; Alop 2004; Emad 2011; Patraiko 2016). In order to have a better understanding of skill development through education and training, some relevant learning theories are examined in the next chapter.



## CHAPTER THREE

# Learning Theory Applicable to Skill Development in MET

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### 3.1 Introduction

In Chapter Two, the changing context of the maritime industry, workplace and skills, together with the changes to the MET system and STCW Convention were presented in detail. It was established how globalisation and technological advancement have affected both policies and practices in the shipping industry. This chapter will now examine how this changing context has affected the instructional methods and learning processes of the seafarers. In order to understand the prevailing teaching and learning processes in the MET system, it is necessary to look at the learning theories relevant to the empirical focus of this study. These theories are further deployed in the Discussion and Analysis chapter to inform the findings of the research.

Historically, apprenticeship was the most common mode of learning through which the seafaring labour force developed their skills and competence on board ships (Hutchins 1995). Despite the changes to the industry outlined in the previous chapter, through which part of the education and training of seafarers shifted to training establishments ashore, seafarers are still expected to gain part of their knowledge and skills on board through observation and hands-on practice. In this chapter, the continued relevance of the apprenticeship model of learning on board ships is discussed.

A variation of the apprenticeship model is the ‘cognitive apprenticeship’, through which a teacher makes explicit to a novice the ‘non-visible’ skills involved in complex processes. Further, in this chapter, the effectiveness of this model is examined and its suitability to the requirements of a contemporary seafaring labour force is considered. Apprenticeships, whether traditional or cognitive, take place on board ship through a dyadic master-novice relationship as well as within the context of the on-board ‘community of practice’. In the community of practice, the process of learning is regarded as taking place through participation in the working life of a community and is based on the theory of situated learning. This theory, developed by

Brown, Collins and Duguid (1989), holds that knowledge is situated in the location where learning takes place, i.e. within the interactions of the community. Situated learning has its roots in the theory of experiential learning developed by David Kolb, which in turn built on the constructivist work of Dewey, Lewin and Piaget (Kolb 1984). The core idea of experiential learning is that knowledge is created through practice. Studying the historical background of the education and training of the seafaring labour force suggests that the above-mentioned learning theories and training models are the most relevant and applicable to the MET system.

In the following sections, these theories and models of learning by doing are examined. As there is a paucity of published research into the application of these theories in the maritime sector, research conducted into their effectiveness in other sectors, mainly the health sector, is presented.

## 3.2 Learning Theories

*“For the things we have to learn before we can do them, we learn by doing them”*  
(Aristotle, c. 350 BCE).

The ancient Greek philosopher here describes the concept of learning through experience or, as Dewey describes it, ‘learning by doing’ (Dewey and Dewey 1915). This is the theory that knowledge is constructed by the individual through practice. A number of theories are founded on the concept of learning by doing and are described as constructivist theories. This view contrast with the behaviourist belief that knowledge exists independently of the individual and that the main aim of education is to instil in learners an accepted body of information and skills previously established by others (Scheurman 1998).

In the following sections a number of theories and models of learning by doing, including experiential learning, situated learning, communities of practice, apprenticeship and cognitive apprenticeship are examined. As there is a paucity of published research into the application of these theories in the maritime sector, research conducted into their effectiveness in other sectors, mainly the health sector, is presented.

### 3.2.1 Experiential Learning

The modern theory of experiential learning, developed in the 1970s by David A Kolb, builds on the work of Dewey, Lewin and Piaget who all describe learning in terms of a cycle of experience. Kolb defines experiential learning as, “The process whereby knowledge is created through the transformation of experience” (Kolb 1984, p. 38). Kolb’s model of experiential learning depicts the process of constructing meaning from experience as a four-stage cycle. The process begins with a *concrete experience*, such as the completion of a task. This is followed by *reflective observation* in which the individual looks back on the experience to consider what works and what does not. The next phase is *abstract conceptualisation* in which the reflection gives rise to new ideas or modifies existing ones, followed by *active experimentation* where the individual plans how to use the new information. This leads back to the concrete experience, repetition of which will now be informed by previous experiences, thoughts and reflection (Kolb, 1984.) According to Rogers (1969) and Hoover (1974), cited in Gentry (1990), in addition to skills and knowledge, feelings and behaviours are also learned in this way.

One of the conditions set out by Kolb as essential for experiential learning is that the individual should be willing and motivated to learn. This suggests that learning is largely self-directed but Gentry (1990) concludes that in order for ‘proper’ learning to occur, tasks should be well-structured from a teacher’s perspective, with relevant, specified objectives, monitoring and feedback. Literature shows that experiential learning is highly valued in the field of medical education; the General Medical Council stating, with regard to the general clinical training of the pre-registration house year,<sup>23</sup> that the “most important element is experiential learning” (GMC 1997 cited in Maudsley and Strivens 2000, p. 536). Pedagogies that facilitate experiential learning include apprenticeships, work placements, role-play, simulations and on-the-job learning (Gentry 1990).

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<sup>23</sup> A term for a mandatory year of training in hospital medicine undertaken by all doctors in the UK upon completion of their medical degree.

### 3.2.2 Situated Learning

Situated learning (or situated cognition) theory draws on many of the ideas considered above. Brown, Collins and Duguid (1989) argue that meaning is contextual and that there is a relationship between learning and the social situation in which it occurs. For learning to be meaningful, it should take place through carrying out 'authentic' activities within the social and physical context where it will be used. Through this method students learn how to apply their knowledge appropriately. "Activity, concept, and culture are interdependent...learning must involve all three" (Brown et al. 1989, p. 33).

Herrington and Oliver (1995) cite a number of case studies and pieces of research that support the situated learning approach as a successful model of instruction. In two studies into the workplace learning experiences of medical students by Bleakley (2002) and Dorman et al. (2007), situational learning takes place in ward-based environments. Both studies found that alongside the development of the necessary level of practical competence, the development of 'social' qualities such as professional identity, confidence and motivation formed a 'hidden agenda' for learning outcomes.

Whether the model can be successfully transferred to the classroom is a matter of debate. This matter is particularly relevant to the discussion on the pros and cons of replacing a portion of the on-board training of officer cadets with training in simulators and workshops. According to McLellan (1994) a successful situated learning environment can be either the workplace, a physical simulation of a workplace setting or a computer-based representation using interactive multimedia. While the use of interactive multimedia is seen as the solution to the problem of using situated learning in the classroom, critics such as Hummel do not believe that it provides an authentic work situation and that "courseware becomes the learning environment and not the authentic situation" (Hummel 1993, p. 15.) Herrington and Oliver (1995) address concerns about such limitations by explaining that when the program, the implementation process, and the learner are considered together, multimedia programs can be developed which address all the key components of a situated learning environment. Research by Lunce (2006) corroborates this view. By looking at three studies where simulations are used to bring real-world learning into the classroom, Lunce concludes that many of the benefits of situated learning can be obtained through the use of simulation in the traditional classroom context.

Situated learning is the theory used by Lave and Wenger (1991) to describe how learning occurs within a community of practice. In the following section, the concept of communities of practice is discussed and consideration is given to how this model applies to communities on board ship.

### **3.2.3 Communities of Practice**

The term ‘community of practice’ was coined by the social anthropologist, Jean Lave and research scientist, Etienne Wenger in their 1991 work, “Situated learning: legitimate peripheral participation”. It is a social theory of learning which describes groups of people who share a common occupation, interest or goal and improve their practice by interacting on a formal or informal basis. On his current webpage, Wenger defines the term thus: “Communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly” (Wenger-Trayner and Wenger-Trayner 2015). Lave and Wenger’s original study of apprenticeship in occupations including midwives, tailors and quartermasters (1991) enabled them to develop their theory of how learning takes place within various communities. In some cases the practice of these groups had remained unchanged for centuries and passed from generation to generation. Therefore, the terminology may be new, but the concept it describes is not, with Wenger describing it as ‘age-old’ (Wenger-Trayner and Wenger-Trayner 2015).

Whereas the primary relationship in an apprenticeship is commonly represented as being between novice and master, Lave and Wenger highlight the value of the interactions that take place between the apprentice and other members of a community of practice.

In situations where learning-in-practice takes the form of apprenticeship, succeeding generations of participants give rise to what in its simplest form is a triadic set of relations: the community of practice encompasses apprentices, young masters with apprentices, and masters some of whose apprentices have themselves become masters. But there are other inflection points as well, where journeyfolk, not yet masters, are relative old-timers with respect to newcomers. The diversified field of relations among old-times and new-comers within and across the various cycles, and the importance of near-peers in the circulation of knowledgeable skill, both recommend against assimilating relations of learning to the dyadic form characteristic of conventional learning studies (Lave and Wenger 1991, pp. 56-57).

What characterises a community of practice, however, is not simply that the novice learns from multiple practitioners, rather than the one-to-one relationship of apprenticeship, but also that knowledge is situated within the social world of the community. Lave and Wenger reject the idea that learning is a process of internalising knowledge transmitted from an external source. Instead, they see learning as involving the whole person participating in the world.

The notion of participation thus dissolves dichotomies between cerebral and embodied activity, between contemplation and involvement, between abstraction and experience: persons, actions and the world are implicated in all thought, speech, knowing and learning (Lave and Wenger 1991, p. 51).

Lave and Wenger use the term “legitimate peripheral participation” to describe the process of how learning occurs in such communities. They describe how newcomers begin on the periphery of a community. This is regarded as a positive, dynamic position where the newcomer has the potential to access sources of understanding through increased involvement with other community members. By initially carrying out simple but authentic tasks, for example delivering messages, the newcomer is able to view the work of the community from different perspectives and thus build up knowledge of various aspects of the practice. Through interaction with other members, the newcomer will eventually move towards a position of full participation. Motivation is provided by “the growing use value of participation, and by newcomers’ desires to become full practitioners” (Lave and Wenger 1991, p. 122). The community of practice renews itself over time as newcomers gradually become full participants and eventually replace ‘old-timers.’ The newcomer’s peripheral position can be seen as pivotal to interactions with other communities of practice, which gives it the potential to be a powerful position.

In the community of practice on-board ships, this is how novices, such as officer cadets, and even the junior officers can develop their skills through interaction with other community members. This involves interaction with members of the same department, e.g. deck department, as well as with members of other departments, such as the engine department. The knowledge and skills are not only developed through interaction with those who are considered as experts but also through interaction with other members of the community including old-hand seafarers, junior officers and near-peers. They start developing their skills by being assigned less important, menial tasks and when they have mastered these gradually, under supervision, they begin to undertake more difficult tasks until they become full participants.

In addition, Lave and Wenger (1991) describe how the journey from newcomer, to full participant, to old-timer also entails identity development. When a newcomer participates in the legitimate practices of the community it enables them to experience what it is like to be a certain type of practitioner and develop the skills, qualities, attitudes and emotions that give the practitioner their identity. “Learning thus implies becoming a different person with respect to the possibilities enabled by these systems of relations. To ignore this aspect of learning is to overlook the fact that learning involves the construction of identities.” (Lave and Wenger 1991, p. 53). Duguid (2005, p. 113), describes this as learning ‘*to be*’, which he says “requires knowing *how*, the art of practice, much of which lies tacit in a CoP [Community of Practice]”. Therefore learning in this context enables practitioners not only to gain knowledge but to learn to apply knowledge appropriately.

In the academic literature, there is controversy as to whether professional identities can actually be acquired while using simulators or college-based workshops (National Research Council 1996). As discussed in earlier chapters, the education and training of officers on board ship has been partially replaced by simulators and workshops in maritime colleges. Whether officer trainees can develop the appropriate attitudes and identities in a simulated environment or whether they need to carry out authentic tasks and experience real shipboard operations within the community of practice in order to know what it actually feels like to perform these roles, is a matter of debate (Safahani 2009).

In order for learning and identity development to take place, newcomers need to be given *access* to the practices of the community. Lave and Wenger (1991, p. 101) acknowledge that access can be problematic and can be manipulated for a variety of reasons. They use the term ‘transparency’ to describe a context that allows access to information flows and conversations and to the ‘inner workings’ of artefacts. Artefacts can be physical, linguistic or symbolic and include tools, technology, stories and community lore (Lave and Wenger 1991; Duguid 2005). Through using artefacts, both tacit and explicit knowledge can be built up. Recounted anecdotes can act as fables to illustrate good and bad practice and can be passed down through the community.

Prevention or removal of access is termed ‘sequestration’. Duguid (2005) identifies two different types of barriers to access. The first type is involuntary, where difficulties exist in the ability to share knowledge, such as those created by cultural differences, language barriers and

time constraints. The second type is voluntary, where “local communities...may simply not want to share, or they may want to hide what they know” (Duguid 2005, p. 113).

Knowledge of these concepts is helpful in understanding how access to knowledge within the community of practice on board ships can be restricted or impeded. There are a number of potential ‘involuntary’ barriers that stem from the changing context of work and the workplace. Examples include social, cultural and linguistic differences as well as the use of new technologies, which have led to many aspects of job performance becoming less visible or hidden (Bakker et al 2006). How these factors may hamper knowledge transfer and consequent skills development is examined in the Discussion and Analysis chapter.

The concept of ‘communities of practice’ has undergone substantial evolution and change since Lave and Wenger first coined the term. “Initially the concept aimed to provide a template for examining the learning that occurs among practitioners in a social environment, but the focus of the concept has diverged during subsequent years (Li et al. 2009, p.11). One notable difference is that the concept, as originally conceived, describes a learning community that has developed naturally (as is the case on board ship) whereas in recent years Wenger has proposed that communities of practice can be intentionally created or ‘installed’ as a management tool for improving productivity (Wenger and Snyder 2000). Wenger has also changed the terminology of the three identifying characteristics of a community of practice from ‘mutual engagement’, ‘joint enterprise’ and ‘shared repertoire’ (Wenger 1998), to ‘the domain’ (the field of interest shared by members of the group), ‘the community’ (interaction between members through meetings, whether in person or remotely) and ‘the practice’ the competencies that are shared and improved upon through the interactions of the group) (Wenger et al. 2002).

It is therefore necessary, when applying the concept of ‘communities of practice’, to define which interpretation is being used. Throughout this thesis, the term is used in the sense it was originally proposed, and is applied to previously existing communities that happen to share the characteristics defined above, rather than communities that have been intentionally created for the purpose of exchanging knowledge. It is used to refer to the on-board communities of a ship, where situated learning takes place as part of the daily working and social practice. Studying the communities of practice model is useful in understanding and identifying the factors that may adversely affect on-board training; for example, the ‘shared repertoire’ may be reduced where crew members come from different backgrounds. Stories of past experiences may no longer be told due to factors such as language barriers, fatigue, reduced leisure time and



reduction of crew numbers. Such factors and the way they affect social interaction and access to knowledge in the community are examined in this research.

In the foregoing, it can be seen how the communities of practice concept is applicable to on-board training of seafarers. However, the literature exploring the role of communities of practice in education and training on board ships is very limited with much greater emphasis given to the ‘apprenticeship’ model as the predominant means of skills development in MET, where a dyadic relationship between the master and novice is prevalent. In the following section, the concept of apprenticeship is examined.

### **3.2.4 Apprenticeship**

The literature shows that the term ‘apprenticeship’ can be defined in two ways. In some cases it is used as a metaphor for learning informally from a more skilled person, as in Dennen and Burner’s comparison between apprenticeship and the way a child learns from an adult. They define apprenticeship in broad terms as, “The process through which a more experienced person assists a less experienced one, providing support and examples, so the less experienced person gains new knowledge and skills,” (Dennen and Burner 2008, p. 426). Other references to apprenticeship use the narrower definition of a more formal arrangement, whereby a novice learns a trade or profession by working for a skilled or qualified person, usually for a recognised period. Guile and Young define the ‘institution of apprenticeship’ as, “The constellation of both legal and contractual rules and relations governing the status of employment, the associated workplace entitlements and the formal and informal educational processes that socialise a young worker into a workplace and occupational culture” (Guile and Young 2001, p. 70.)

In the literature, the original model of craft or trade apprenticeship is usually referred to as ‘traditional apprenticeship.’ The identifying features of learning through traditional apprenticeship are listed by Berryman (1991) as being firstly, that motivation comes from the desire to complete the work itself rather than from the acquisition of qualifications or certificates; secondly, that apprentices begin with simple tasks where mistakes have less serious repercussions; thirdly, that learning involves the ability to physically perform a task rather than to describe it; fourthly, that performance standards are an intrinsic part of carrying out the work and it is obvious when standards have been attained and finally, that teaching is carried out by

experts through the example they set as they carry out the tasks of their job, rather than being an conscious activity.

In research on the subject of apprenticeship, one is likely to find reference to how long this model of learning has been in existence. Described variously as being used since “ancient times” (Collins et al. 1991, p. 6), “dating back at least to the medieval Guilds” (Toner 2002, p. 56), and being used “long before universities even existed” (Dennen and Burner 2008, p. 427), apprenticeship can lay claim to being the oldest model of learning. The fact that for centuries it was the method by which novices worldwide learned their profession, trade or craft, would appear to be testament to its effectiveness. However, in the nineteenth century the widespread introduction of schools throughout the developed world meant that apprenticeship was no longer the most common method of education (Collins et al. 1989). Economic recession led to a decline in the number of traditional apprenticeships in Britain in the 1970s (Huddleston 1998) and now, in the twenty-first century, apprenticeship’s viability and sustainability as a method of skill acquisition is a matter of on-going debate.

According to Resnick, “Real apprenticeship has all but disappeared in industrialized countries, although the title is sometimes retained for entry level, trainee positions” (Resnick 1989, p. 13). The author attributes this to the prevalence of highly technical industrial processes which can take days to complete, preventing apprentices from viewing the processes from beginning to end during their work placements. Also, the safety and potential cost implications of allowing trainees access to complex equipment mean that learning by trial and error is no longer appropriate. Finally, neither the technical processes nor the thought processes of the ‘experts’ are visible, so learning by observation and imitation is not sufficient. This view is also shared by Berryman who says, “Clearly, traditional apprenticeships are not entirely transferable to a modern society where many skills, such as mathematics, law or computer-based machining, are at best only partly visible” (Berryman 1991, p. 3).

This idea that apprenticeship learning involves a tacit process, whereby apprentices model themselves on experts or masters, is challenged by the findings of Fuller and Unwin (2003). In a study of Modern Apprentices in the UK steel industry they found that apprentices were soon able to pass on knowledge and skills to their less-experienced colleagues.

It would appear from our data that people are clearly able to articulate and make explicit enough of their job-related knowledge and skills in order to then ‘teach’ their

colleagues. Our findings also indicate that the role of teaching and instruction in apprenticeship is underplayed in the situated learning perspective (Fuller and Unwin 2003, p. 45).

In addition to challenging the notion that all apprenticeships are largely tacit in nature, this example demonstrates that apprentices can learn from their peers, which corresponds with the on-board situation described previously. As stated in section 3.2.3, during on-board training, cadets do not learn solely from the senior officers who supervise them, but also learn from the junior officers and ratings within the on-board community of practice.

Fuller and Unwin are much more optimistic about the future of apprenticeship, considering that it remains a vibrant part of vocational education and training systems. They claim that apprenticeship is understood world-wide, saying that it “transcends educational and sectoral boundaries and hierarchies as evidenced by its use as a term and as a model of skill formation by lawyers, doctors, journalists, plumbers, chefs, and musicians” (Fuller and Unwin 2011, p. 261).

A century ago, apprenticeship for a career at sea in the British Merchant navy was a formal arrangement, the terms of which were set out in a contract called an indenture. At this time, apprenticeship was the dominant form of vocational experiential training, which took place entirely on board ship. Since the latter decades of the twentieth century, a combination of shore-based and shipboard training has replaced this type of apprenticeship (Kennerley 2005). However, the term ‘apprenticeship’ is still applied to the shipboard part of the training.

Fuller and Unwin’s vision of the future of apprenticeship is that of a model that evolves to suit the changing demands of the modern workplace (2011). One such variation of the model is cognitive apprenticeship. As mentioned in the previous section, in the shipping industry, the changing nature of tasks and sophistication of new equipment and machinery has affected the teaching and learning process on board ships, making many aspects of jobs less visible (Emad 2011). Operating complex machinery, computers and controls is mainly through the mind process of the practitioner and many aspects of the operation are not visible. In such workplace settings, observation per se may not be sufficient for effective training and skills development. In order for the mentee to understand the work process and for learning to be effective, more elaboration of the procedures may need to be provided by the mentor while performing a task. The apprenticeship model can therefore be tailored to accommodate the changing demands of

the modern workplace, as Fuller and Unwin suggest. Cognitive apprenticeship is a variation of the apprenticeship model which has been developed to address these new demands.

### 3.2.5 Cognitive Apprenticeship

An adaptation to the traditional apprenticeship model, called ‘cognitive’ apprenticeship, has been proposed by Collins et al. (1989) which includes instruction in thinking. They define the concept as, “Learning through guided experience on cognitive and metacognitive, rather than physical, skills and processes” (p. 456). Where the thinking processes involved in a learning activity, such as decision-making and problem-solving skills, were previously implicit, the cognitive apprenticeship aims to make these explicit so that learners can put them into practice. Cognitive apprenticeships “aim to make the thinking process of a learning activity visible to both the students and the teacher” (Ghefaili 2003, p. 1).

The cognitive apprenticeship model comprises six teaching methods: modelling, coaching, scaffolding, articulation, reflection and exploration, briefly summarised below.

*Modelling* is the demonstration of a skill by an expert (in person or using aids such as DVDs) so that the students can conceptualise the processes involved in performing the skill. *Coaching* is the observation by an expert of students carrying out a task and the provision of suggestions, feedback and reminders and further demonstration if necessary. *Scaffolding* is support in the form of suggestions, help or physical aids pitched at the learner’s level of skill, which is gradually removed as the learner’s skill increases (the process of *fading*). *Articulation* is the process of enabling students to verbalise their knowledge and thought processes while carrying out a task. In the *reflection* stage students are encouraged to be self-critical and compare their performances and thought-processes with those of an expert, other students and eventually, with a cognitive model of expertise which they will have internalised. Finally, in the *exploration* stage students are guided towards problem-solving on their own. They are set general goals and encouraged to conduct their own research and frame their own objectives (Collins 1991).

The cognitive apprenticeship model is used to train practitioners in a number of fields, including nursing, teacher training, instructional technology, chemistry and engineering (Dennen and Burner 2008). An example of the model being put into practice is given by Woolley and Jarvis (2007) who describe how a purpose-built Clinical Practice Suite,

replicating a hospital ward setting, has been constructed at the School of Care Sciences, University of Glamorgan, expressly designed so that student nurses can be trained according to the six stages of the cognitive apprenticeship model. The challenges of implementing the model are identified as being the cost of equipment, technical expertise and staff training requirements and the time it takes to implement and deliver within the curriculum.

Stalmeijer et al. (2009) examined the implementation of the cognitive apprenticeship model from the point of view of medical students. Students working in focus groups were given vignettes based on the six teaching methods of the model and asked to relate the examples to their own experiences to assess how successfully they perceived these factors to have been implemented in their training. The findings of the investigation were that all teaching methods had been experienced but the students showed greater recognition of modelling, coaching and articulation and had less experience of scaffolding, reflection and exploration. Problems identified by the study were the inconsistent use of teaching methods (attributed to teachers allocating insufficient time and lack of teaching skills), lack of knowledge of students' skill levels in the scaffolding phase and the need for further explanation in the modelling phase of how and why the clinicians performed tasks in a particular way. The students proposed remedies for these problems, suggesting they could be proactive in stimulating the use of certain teaching methods, that being attached to an individual teacher for longer periods increased their feeling of involvement, that teachers should be encouraged to ask the students about their level of training and that teachers should receive training in giving feedback to aid coaching. The authors concluded that, "Although further research is needed to establish the usefulness of the model, we believe that it is safe to say that the model shows promise as an instrument for studies focusing on evaluation, feedback, self-assessment and faculty development in clinical teaching" (Stalmijer et al. 2009, p. 545).

In 2008, Dennen and Burner conducted a review of recent empirical research into the Cognitive Apprenticeship model in educational practice. The review looked at research regarding the application of the model as a whole, the application of component parts of the model and the application of parts of the model within communities of practice. The authors concluded that, "The cognitive apprenticeship model is an accurate description of how learning occurs naturally as part of everyday life and social interactions," and that "the instructional strategies that have been extracted from these observations of everyday life can be designed into more formal learning contexts with positive effect" (Dennen and Burner 2008, p. 426). At the time

when the study was conducted, it was noted that the existing research was fragmented and there was a need for a more systematic approach to developing “instructional design, teaching and learning based on the cognitive apprenticeship model” (Dennen and Burner 2008, p. 426).

### **3.3 Summary**

In this chapter a number of theories and methods of ‘learning by doing’ relating to the empirical focus of this research were examined. It was explained that the theories of experiential learning, situated learning and communities of practice are all based on the concept of learning by doing. The development of these theories, their relationship to each other and how they apply to the education and training of seafarers were then presented.

Traditionally, merchant ship officers were trained on board ship through the apprenticeship model of learning where they developed their skills mostly through observation and practice. However, the globalisation of the industry as well as technological advancements of ship construction and equipment have had an impact on the education and training of the seafarers. Factors such as the multi-nationality of the crew complement, reduction in crew numbers, differences in culture and language, have affected the social interaction between crew members which, in turn, affected the training and skills development within the community of practice on board ships. Moreover, the new technology introduced a modern workplace in which many aspects of the job process became less visible and raised the question of whether the apprenticeship model is still an effective means of training. In order to address the changing demands of training in modern workplaces, Fuller and Unwin (2011) suggest that changes need to be made to the traditional apprenticeship model of learning and one such variation to the model is that of cognitive apprenticeship. This chapter examined both traditional and cognitive apprenticeships of learning and their relevance to the MET.

The learning theories and methods studied in this chapter will be deployed in the Discussion and Analysis chapter to shed light on the underlying reasons for the skills and competency gap of the officers and to examine whether the preconditions for their successful implementation currently exist within the MET system.

So far in this thesis, the globalisation and technological advancements in shipping, their effects on the education and training of the merchant ship officers as well as the literature and evolution

of MET and the related learning theories have been examined. In the next chapter, the methods and methodology of the research is presented.

# CHAPTER FOUR

## Methodology and Methods

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### 4.1 Introduction

As discussed in earlier chapters, this research is an empirical examination of education and training in the shipping sector with particular emphasis on the competency of merchant ship officers. The study examines whether employers and seafarers perceive a gap in the skills and competency of the merchant officers and if so, what is its nature and what are the underlying reasons for the gap. If such a gap is identified, the research further aims to examine whether it is being addressed within the industry.

By and large, the identification and examination of underlying reasons for the perceived competency and skills gap is considered to be the main aim of the research. In order to achieve the research aims, the following research questions will be addressed:

- *What informs the main stakeholders' (ship owners, ship officers and trainers) perceptions, concerning the ship officers' skills and competency gap?*
- *What is the nature of the perceived skills gap, as understood by informants?*
- *What are the impediments to the education and training of the officers, as perceived by the stakeholders?*
- *Are the perceived gaps between the training being provided to the officers and the actual skills they need to perform their assigned duties adequately addressed by stakeholders?*

This chapter is a discussion of the methodology of the study and the methods I have used to gather the necessary data to answer the research questions and meet the aims of the research. Here, I will also discuss various data sources and the reason for selecting them, data analysis, ethical considerations and anticipated difficulties throughout the research.



## **4.2 Research Design**

While there is some confusion between research design and research method (Bryman 2001; De Vaus 2001), Bryman (2001) clearly states that research method refers to data collection techniques, as distinct from research design. He describes research design as providing “a framework for the collection and analysis of data” and states that the selection of research design is dependent on the aims of the research (Bryman 2001, p. 29). That is, the choice reflects the purpose of the study, whether the study is concerned with finding a causal relationship between variables, or generalising the outcome, or understanding specific behaviour in its social context (Bryman 2012).

According to De Vaus (2001, p. 1) social researchers attempt to find answers to two fundamental types of research question. Those are ‘what is going on?’ (descriptive research) and ‘why is it going on?’ (explanatory research). The main aim of this study is to examine ‘what’ is going on in the industry concerning the seafaring labour force, their education and training, the skills they need to perform their jobs, and the regulations set to ensure competency and certification of the merchant ship officers. The research also examines whether there is a perceived competency and skills gap in the industry and if so, ‘why’ this is the case. These two issues will be studied in tandem in order to shed light on the main research aims of this study. Therefore, this research is both descriptive and explanatory qualitative research, investigating the perceived competency and skills gap of the merchant ship officers and the underlying reasons for the gap.

## **4.3 Research Planning**

In order to find answers to the research questions, I needed to make a clear plan to conduct the study and think of essential elements that could help to uncover the underlying reasons for the perceived skills and competency gap of the merchant ship officers. These ingredients include having ample understanding of the research context and associated literature, embracing an appropriate theoretical stance and strategy, adopting appropriate method(s) to collect necessary data and identifying the target groups and informants. These issues are discussed in detail further in this chapter.

## 4.4 Composition of the Context and the Literature

Bryman (2012) suggests that “someone planning to conduct research must be familiar with the *literature* on the topic or area of interest” (p. 5). In the case of my research, prior to examining the literature of merchant mariners’ education and training, I realised that the research question could not be answered through knowledge of the MET literature per se. There could be several underlying reasons affecting the skills development of the merchant ship officers. Hence, it was necessary to start with understanding the wider context around the research theme.

From the early stages of this research, having refined my research aims, my supervisors advised me that an understanding of globalisation as well as technological advancements in the maritime industry were a prerequisite for conducting this study. Globalisation and new technologies are both prominent factors shaping changes in labour supply and demand as well as the changing context of maritime employment over the last thirty years.

Prior to addressing the research questions, it was essential to gain an appropriate and ample understanding of economic globalisation and the movement of capital, which, together with de-regulation, have resulted in changes in the organisation of the shipping industry, particularly the labour supply patterns. In this process, through an extensive literature review, I examined how globalisation in the shipping labour market has led to a shifting of interests in maritime education and training of seafarers from traditional maritime nations to emerging shipping labour supplier countries and the potential effects of this shift on the quality of training of the officers. The technological advancements in shipbuilding and introduction of automation and modern shipboard equipment are other prominent factors that resulted in the changing context of the workplace. The transformation of the nature of the shipboard tasks consequently demands changes to the training and skills requirements of the seafaring workforce, which are examined in this research. These issues form the core of the contextual chapter of the research (see Chapter Two).

Moreover, in order to achieve the key aims of this research, it was found necessary to examine the historical background of the MET system, evolution of the STCW Convention, previous research in this area and learning theories relevant to the training of the seafarers (see Chapter Two).

## 4.5 Theoretical Stance and Research Strategy

I have learned through my studies that a successful social research project needs to be structured on a clearly defined research strategy and adopt an appropriate theoretical stance (Gorard 2013), in line with its research aims and objectives.

Recalling my background as a technical seafarer, I was used to looking at the world from an 'objective' point of view. I was far more familiar with quantitative methods of data collection and analysis, based on facts and figures. When I joined the social science group in Cardiff University, I gradually became acquainted with 'subjectivist' and 'constructivist' approaches to looking at social phenomena (eg. Denzin and Lincoln 1994; Bryman 2004; Flick 2014) by attending taught modules such as 'Principles of research design' and 'Qualitative methods of data collection and analysis'. At this time, I became more familiar with some of the essential critical issues of social science and could better conceptualise that there are underlying structures that guide the process of social interpretation and knowledge construction.

According to Payne and Payne (2004, p. 152), "Objectivity in social research is the principle drawn from positivism, that, as far as possible, researchers should remain distanced from what they study so findings depend on the nature of what was studied rather than on personality, beliefs and values of the researcher." This is an approach not accepted by researchers from a critical standpoint or from interpretive traditions. Positivism is considered as the major epistemological paradigm in natural science and similarly in social science from the 1930s through to the 1960s (Gray 2004). Its core argument is that the social world exists externally to the researcher and its properties can be measured directly through observation (Gray 2004). While Williams and May (1996, p. 27) describe positivism as "one of the heroic failures of modern philosophy", Hughes and Sharrock (1997) identify one of the fundamental mistakes of positivism as some of the assumptions it makes about scientific inquiry. In view of that, Gray (2004, p. 18) states that, "Science is, certainly, interested in producing theoretical explanations but not just on the basis of what can be observed." Payne and Payne (2004, p. 154) argue that positivist objectivity is inherently 'conservative'. Moreover, those most vocal in rejecting a narrowly objective social science argue that one of sociology's tasks is to clarify the social constitution of society, so that it can be changed for the better. Hence, without a clear set of values, it is impossible to define what is socially problematic and what might be done better (Payne and Payne 2004).

According to Gray (2004, p. 20) a major anti-positivist stance is interpretivism, which looks for “culturally derived and historically situated interpretations of the social life-world” (Crotty 1998, cited in Gray 2004, p. 20). Gray (2004) claims that there is no direct, one-to-one relationship between ourselves (subjects) and the world (object) and the world is interpreted through the classification schemas of the mind. In terms of epistemology, interpretivism is closely linked to constructionism (Gray 2004). It is an ontological position that asserts the “social phenomena and their meaning are continually being accomplished by social actors” (Bryman 2004, p. 17). In the process of social interaction, human beings not only interpret phenomena and construct meaning, but also create social structures and institutions, which in turn govern the process of social interaction. According to Bryman (2004) these structures and institutions are not universal or permanent. They are continuously revised and changed through the constant interaction of humans and their environment and the social settings (Bryman 2004). Thus, the social world and the meanings and realities within are not fixed or stable but are constantly and continuously revised on the basis of experience (Gray 2004). There is therefore a dynamic relationship between the subject and object and it is through this relationship that social meaning and reality are created.

Having considered my own research topic in the light of the above and having taken into consideration the substantial literature about objectivism and positivism as ontological and epistemological positions, I found my research ontologically and epistemologically best framed in the constructivist and interpretivist approaches respectively. In relation to this study, my stance is that social research is not a process of discovering facts that already exist independently of human experience and interpretation, but rather that meaning is generated in the interaction between the researcher and respondent. As Denzin and Lincoln (1998) and Payne and Payne (2004) have argued, social research is therefore an active construction process in which the researcher is deeply involved and implicated. They emphasise that the social world cannot be measured with precision and predicted on quantitative generalisations. Researchers in the real world must seek to discover how people understand and relate to their world and how they create and share meaning about their lives and work; it is about understanding how people view what happens to them and around them at a particular time and place (Berger and Luckman 1967; Rubin and Rubin 1995; Gray 2004).

The next consideration is the selection of a qualitative or quantitative strategy. Bryman (2001) presents the distinction between these two fundamental paradigms. Quantitative research is

concerned with a deductive approach and the testing of theories by quantifying the data of social phenomena, and views social reality as an objective activity. In contrast, a qualitative approach is predominantly involved with the generation of theories, and deems social reality as an emergent entity of an individual's creation (Bryman 2001). Punch (1998) illustrates the difference in terms of methodological implications. Whilst a quantitative strategy concerns finding out factors which affect specific phenomena and the determinants or correlation between variables, qualitative research refers to discovering, seeking to understand or exploring a process and describing experiences. He suggests that the selection of strategies relies on the research question and the aim of the study, that is, what the researcher is trying to find out. In addition, consultation of past literature, practicality considerations such as time, budget and the availability and the accessibility of samples, and the researcher's familiarity with the situation all influence the choice (Punch 1998).

Considering these factors, a qualitative approach is adopted for this research. In the light of the aims of this study, it is an appropriate strategy. Miles and Huberman (1994) note that qualitative data relies on people's 'lived experience', and so are "fundamentally well suited for locating the *meanings* people place on the events, processes, and structures of their lives: their perceptions, assumptions, prejudgements, presuppositions [...] and for connecting these meanings to the *social world* around them" (Miles and Huberman 1994, p. 10). Qualitative research enables the researcher to understand these meanings, and also the particular context within which the individual acts, the effect of this context on their actions, and the process by which these actions take place (Maxwell 2005). Moreover, qualitative data provide 'thick descriptions' which, due to their richness, help to communicate the complexity of the phenomena (Miles and Huberman 1994).

It was evident that a qualitative strategy would be of particular relevance because the aim of the research concerns examining the perceptions of the stakeholders and exploring the underlying reasons for their perceptions about the skills and competency gap of the merchant ship officers, in order to obtain a better understanding of the phenomenon. In this case, the respondent is the most significant element in the qualitative research process, and unlike the positivist surveyor, the qualitative researcher gives voice to the individual respondent (Flick et al. 2004; Braun and Clarke 2013; Barbour 2014; Bryman 2014). Quantitative surveyors approach the research field with readily formed concepts for which they seek confirmation (Bryman 2004). They construct precise and standard questions that they ask all respondents in

the same way. This does not allow room for any depth in exploration of complex concepts, which require elaborate interpretation.

## **4.6 Data Collection**

According to Rubin and Rubin (2005) social research utilises an array of techniques; survey researchers ask people standardised questions; demographers analyse official data; and some social researchers use experimental techniques. However, qualitative social researchers gather information by observing, talking with and listening carefully to the people who are engaged in the research. Qualitative researchers obtain data principally through participant observation and qualitative interviewing. Rubin and Rubin (2005) state that when doing participant observation, naturalistic researchers observe from the side-lines or join the activities of those they are studying, but interviewing techniques rely less on watching and more on asking questions. Through qualitative interviews, we can understand experiences and reconstruct events that we did not participate in. Rubin and Rubin (2005) recommend the qualitative interview technique for describing social issues.

To address my research questions, the most appropriate approach to data collection is qualitative interviewing. There are a number of practical reasons for not employing participant observation. The fact that different institutions and organisations involved in the study are located in different countries makes it logistically impossible, as do time restrictions. In supporting the case for qualitative interviewing, Fontana and Frey (1998) recognise interviewing as the key to social discovery and construction. Moreover, Mason (1996) suggests that most qualitative research, in one way or other, ends up using interviewing, whether as the main strategy or as complimentary to other data collection methods, which means that this technique works well with other data collection techniques, including the document analysis I employ for my research.

According to Bryman (2012), ‘documents’ are another source of data that is commonly used by social researchers. The wide range of ‘documents’ being used in the social research include official documents from the state and policy documents from the companies and organisations. To understand the wider policy context, I examined a number of key official documents regarding education and training of merchant ship officers in general and the policy documents and training curricula in particular.

Data collected through interviews as well as information acquired from official and policy documents are the main data sources used for this research. The following is an elaboration on the data collection methods of this study.

#### **4.6.1 Interviewing**

Dey (1993) claims interviewing is the most commonly used method in social research. A qualitative interview is considered to provide greater depth than some other data collection methods and it is an effective way to access people's perceptions (De Vaus 2001). Gaskell (2000) regards interviews as a joint venture, a sharing and negotiation of realities in which the interviewer and informant are in different ways involved in the production of knowledge. Interview approaches vary in terms of the extent to which they are structured. In the 'general interview guide approach', the researcher identifies a series of topics or broad interview questions which serve as a guide for exploring and probing the informant (Patton 1990). Arskey and Knight (1999, p. 32) add that, "Interviewing is a powerful way of helping people to make explicit things that have hitherto been implicit – to articulate their tacit perceptions, feelings and understanding." A major theoretical strength of the interview technique, which reflects on a rich qualitative research tradition, is its recognition of the interviewer as part of the research, unlike quantitative methods which insist on eliminating the presence of the researcher from the research. Researcher influence is considered a contamination of the purity of data but the qualitative tradition questions the practicality of this by pointing to the fact that, as informed social beings, researchers carry their views, opinions and some basic understanding of the problem under investigation, into the field. It is therefore impractical to try to eliminate their presence and influence on both data generation and data analysis processes (Hammersley and Atkinson 1995; Baszanger and Dodier 1997; Fielding and Thomas 2001).

The semi-structured interview approach is probably the most used of all the interview approaches (Rubin and Rubin 2005). Unlike structured interviews, there are many variations in this approach such that within the same schedule, questions will vary in the degree of openness, while at the same time some questions will be funnel-type while others will be probe-type. The funnel-type questions start with an open statement followed by a series of questions designed to narrow the scope down to the specific area. The probe-type start with a specific question and by use of probes allow the researcher to explore general answers in greater depth. The idea behind both types of questions is to exhaustively explore the area of investigation.

I designed my interview schedules (Appendices 3a-3e) in such a way that questions follow each other in a logical sequence so that the later questions build upon and expand the scope of the earlier questions. In this way, by the end of the sequence, the specific area of investigation is covered exhaustively and in a logical way. This approach makes it easy to relate the responses from the different questions in a progressive development. The use of such opening phrases as ‘to what extent?’ or ‘in what way?’ give the respondent room to respond in an unrestricted way so as to generate full responses which include both factual knowledge and informed opinion. Also, the deliberate use of closed questions followed by probes, which I use during this research, is another strategy to explore the area from the specific to the general. The answer to the closed, specific opening question is then built upon by probes until a full response is offered by the respondent.

A key strength of the semi-structured interview is that it allows the interviewer to control the process of gathering information, whilst at the same time allowing for new leads and issues to be followed as they emerge. The semi-structured interview, in particular, allows the researcher to build into the interview frame a level of flexibility which captures insights and personal perspective which may well be lost through the imposition of a more rigid ‘structured’ interview (Denzin and Lincoln 2000).

Bowman et al. (1984) suggests that the depth of understanding required to do qualitative interviewing makes it difficult for qualitative researchers to remain value-free or neutral towards the issues raised. Rubin and Rubin (1995, p. 12) add that the interview is affected by the researcher’s personality, moods, interests, experiences, and biases. How the researcher asks questions changes depending on how he or she feels about the topic or the interview and what the researcher hears from the answer may depend on his or her mood, understanding and prior experience. These were the issues I needed to be aware of prior to conducting interviews in order to avoid any adverse effect on the quality of data.

It should be noted that semi-structured interview methods inevitably entail a number of limitations. One of the major weaknesses of the interview is the danger of bias. Patton (2002) points out that there is potential for interview data to be distorted due to personal bias and the emotional state of the respondent and the researcher. Further, he recounts the source of bias during an interview, *inter alia*, to be: the attitudes, opinion and expectations of the interviewer; a tendency for the interviewer to see the respondent in his/her own image; a tendency for the interviewer to seek answers that support her/his preconceived notions; misperceptions on the



part of the interviewer of what the respondent is saying and misunderstanding on the part of the respondent of what is being asked.

While it is impossible to be completely free of bias (Strauss and Corbin 1998) and personal value (Bryman 2001), it is important for the researcher to be conscious of these limitations, recognise the potential for bias and make an effort to minimise the risk. They suggest, for instance, that careful formulation of interview questions, of which the meaning is clear, is crucial. Biases can intrude into the analytic process as well. Strauss and Corbin (1998) note that in order to reduce the danger of bias, it is essential to stand back and examine the data objectively by questioning everything, and not to accept the words or explanations given by the respondents at face value.

In the literature on qualitative approaches, there is a clear recognition that the issue of researcher influence is delicate and must be treated with caution. Researchers must carefully gauge the extent of their involvement to ensure that their role does not dominate the interview process in the form of advocacy and deliberate efforts to find solutions to problems (Forester 1993; Thomas 1993). Noting my background as an old-hand seafarer, having personal perceptions and experience in the research area, I had to be extremely cautious to keep my impartiality, not only during the interview process but also when I was analysing my findings.

While conducting the interview there are some important issues of interview dynamics which need to be considered. These include how, practically, to listen and ask questions within the interview. While there is much advice in textbooks about such factors as steering, probing, sequencing and framing of questions during the interview (Mason 1996; Denzin and Lincoln 1998), many of these issues can probably only gradually be resolved by practical experience of conducting interviews in the field. So, it is necessary to use any opportunity to do pilot interviewing prior to commencing fieldwork. For this purpose, since I did not have any previous interviewing experience, I practised a couple of times and interviewed my friends in order to develop my interviewing skills prior to approaching the field. Moreover, in order to ensure that the research questions “operate well” and the “research instruments as a whole function well” (Bryman 2014, p. 263) I conducted three pilot studies with informants from different target groups. Conducting these pilot interviews also provided me with some experience and confidence in steering the main interviews.

One of the reasons for employing a semi-structured interview method for this study is that this type of interviewing is neither too strictly structured as to curtail conversation, nor too unfocused. Instead, it follows a mechanism of self-adjustment which provides the interviewer with the opportunity to restructure and reorganise questions to suit the special circumstances of the interview as well as background and experience of the interviewee. It is therefore structured enough to give focus and open enough to allow for the flexibility to accommodate different interviewees and situations. For the purpose of this research I needed to interview different people from diverse backgrounds and organisations. While I needed, to some extent, to ask questions that were focused on the research topic, on the other hand I needed to be flexible with the questions to different interviewees and let them speak out about the hidden issues that might shed light on the research topic.

Most importantly, the semi-structured interview technique recognises and accommodates the individuality of those being interviewed. Unlike the quantitative survey, qualitative interviewing gives voice to the interviewees and indeed centres their role in the process of data generation. Thus, instead of appearing as research objects, the interviewees' role is seen as the most important part of the process. The semi-structured interview technique therefore gives interviewees the opportunity to describe their worlds in their own words and acknowledges varying views reflecting the complexity of social life.

In this particular study, the various experts within the shipping industry possess a wealth of knowledge and have views and opinions about the subject of the research. Policy experts, training experts, ship owners, ship managers<sup>24</sup> and seafarers, all have their views on the nature of the problem, and on the effective solutions. It was not a surprise to find these views and opinions differ from person to person.

The semi-structured interviews used in this research were conducted either face-to-face or remotely by telephone interview. The face-to-face interviews were convened in the interviewees' premises and each interview took circa one hour. Due to the geographical

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<sup>24</sup> Some independent ship owners have their own vessel operating capability, so their own personnel operate their ships. However, ships may also be owned by investors such as banks who lack the necessary expertise to operate them. Such owners outsource the expertise needed to operate their ships to specialised companies. These are known as ship management companies (also known as ship managers). Ship managers usually offer a range of different management services, such as crewing management, technical management, commercial management etc. Those ship managers who are involved with crewing management either recruit officers from the pool of the global shipping labour market and/or recruit and train their own personnel.

diversity of the sample, and due to time constraints and budget limitations, the use of telephone interviewing was inevitable. There is a rich body of literature about the pros and cons of this data collection method (Tausig and Freeman 1988; Frey and Oishi 1995; Gall et al 1996; Creswell 1998; Bryman 2012). However, for the purpose of my research, I found the telephone interview method very effective, with one exception. On some occasions, I found it slightly challenging, to keep telephone respondents engaged enough for an hour's interview. Since this was my first experience in conducting telephone interviews, some practice interviews were carried out to ensure that equipment was set up properly and that I could stay focused on key topics linked to my research questions.

All of the interviews within the UK, Iran and the six interviews with ship officers in India were carried out face-to-face and the rest of the interviews were carried out via telephone. Details of the number of the interviews are provided in Figure 4.1 (see section 4.7).

The interviews were conducted in two stages. The first stage interviews were carried out in 2009, when the first major revision of the STCW Convention, known as STCW 95, had been in practice for nearly 15 years. However, at the time of the first stage interviews the STCW was undergoing a new revision. Therefore, I thought it essential to wait and witness the implementation of the new STCW 2010 in order to be able to verify the perceived effectiveness of this revision that was introduced in response to changing industry needs. Hence, the second stage of interviews were planned and conducted in 2013.

With the introduction of the STCW 2010 Convention, which is claimed by the IMO to be a comprehensive revision of STCW 95, I realised that it was necessary to approach the concerned stakeholders of the industry to discover their views on the impact of the new STCW on the quality and competence of the shipping workforce. In planning for the second stage interviews, comprehensive meetings were convened, comprising the researcher and the supervisors to the research, during which the extent of the changes to the STCW were discussed and the relevant informants were targeted. Initially, I intended to interview some of the same shipping companies and officers who were interviewed in the first stage data collection in order to find out their opinions about the new changes to the STCW Convention. Taking into consideration that the first stage interviews were conducted a few years ago, it was not an easy task to get hold of the same people. However, one shipping company and a few officers from the first stage interviews were approached and the issue of the new STCW requirements was preliminarily discussed with them. It was not very surprising when they unanimously

announced that they were not too conversant with the new STCW requirements. Since the enforcement deadline of the STCW 2010 was 1st January 2017, they stated that it was too early to assess the impact of new training arrangements. At this point, the new requirements of the revised Convention were almost halfway through the implementation timeframe, and the training institutes were found to be the most appropriate informants on the changes to the training requirements and the possible impacts of the STCW 2010 on the seafarers' training. Hence, it was decided to target only the training institutes for the second stage of the empirical work.

Transcribing interviews is a time-consuming part of the research process which also requires careful consideration. It was planned to audio record the interviews. Permission to use recording equipment needed to be requested and the interviewee's acceptance was not always guaranteed. However, even if the interview is recorded, Arksey and Knight (1999) suggest that there is the potential for data loss and distortion. Such data losses could come in the form of non-verbal communication or mistakes in transcription. Time needed to transcribe interview recordings must also be taken into account. During the course of conducting interviews, I experienced a number of occasions when the interviewee did not accept my request to use the digital recorder and I had to take notes during the interviews. Being the only interviewer, I found it extremely challenging to write detailed notes at the same time as posing suitable interview questions.

#### **4.6.2 Document Analysis**

The second method of data collection for my research is using 'documents' as sources of data. What I mean by 'documents' here is materials that can be read, have not been produced specifically for the purpose of social research, and are relevant to the concerns of the social researcher (Bryman 2016). In discussing the different kinds of documents used in social research, Scott (1990) has distinguished between personal documents and official documents and has further classified the latter in terms of private as opposed to state documents. A further set of important distinctions made by Scott relates to the criteria for assessing the quality of documents. He suggests (1990, p. 6) four criteria, namely authenticity, credibility, representativeness and meaning. What he means by authenticity is whether the evidence is genuine and from unquestionable origin. Credibility means that a document is free from error

and distortion. Representativeness is typicality of the document and meaning is whether the document is clear and comprehensive.

According to Gray (2004) documents are some of the most frequently used sources of data collection and include a wide variety of organisational and institutional documents and state political and legal records. A distinct advantage of using documents, as a source for data generation, is their non-reactivity; while the information may sometimes be inaccurate or incomplete, at least it is not usually manipulated by the producer of the data in the knowledge that the material is going to be studied (Gray 2004). Hakim (1993), cited in Gray (2004) suggests that administrative documents and records can provide the basis for international comparisons and studies of organisations and policy development. This feature of document analysis corresponds to the focus of my research on the MET-related regulations, STCW Convention, and documents related to the shift in MET providers from traditional maritime nations to newly emerged labour supply countries, and to differences in the interpretation and implementation of policies.

For the purpose of this research, policy documents are utilised, such as those of the IMO and Merchant Navy Training Board (MNTB)<sup>25</sup> of the UK, and official documents of relevant organisations from public and private sources, such as training institutes, Baltic and International Maritime Council (BIMCO)<sup>26</sup>, International Shipping Federation (ISF)<sup>27</sup>, Society Of International Gas Tanker & Terminal Operators Ltd (SIGTTO)<sup>28</sup> and International

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<sup>25</sup> The Merchant Navy Training Board (MNTB) is a voluntary body and charitable trust responsible for maritime education and training of the workforce for the merchant navy in the United Kingdom.

<sup>26</sup> BIMCO is the international shipping association representing ship owners.

<sup>27</sup> ISF is the international employers' organisation dedicated to maritime manpower issues.

<sup>28</sup> The Society of International Gas Tanker and Terminal Operators (SIGTTO) is an international organisation whose mission statement is 'to promote shipping and terminal operations for liquefied gases which are safe, environmentally responsible and reliable' through the development of best operating practices and guidelines, a sustained learning environment, promotion of training and development of all within the industry.

Association of Independent Tanker Owners (INTERTANKO)<sup>29</sup> as well as shipping companies' training policies.

This information enables me to examine the historical background of the MET system, as well as mechanisms for implementation and monitoring of the STCW Convention.

## **4.7 Interview and Document Sampling**

Flick (2014) states that, "The general issue of sampling is how to select cases or examples from a wider population (which might be too big to be studied completely) so that the research in the end can make statements that apply not just to the individual participant(s) of the study (p. 167)." There are several reasons for it not being feasible to take an entire population in the data collection process, including time limitations, financial restrictions, accessibility to participants and willingness to participate. 'Gatekeepers' (the people we negotiate with to make interview appointments and/or get access to the data) can also provide an obstacle by denying access to selected interviewees and data (Flick et al. 2004; Bryman 2012).

For the purpose of this research, I adopted a 'purposive' sampling strategy (Patton 2002; Braun and Clarke 2013) and given the challenge of gaining access (see section 4.10, Anticipated Difficulties), a 'snow-ball sampling' approach (Bryman 2012; Gorard 2013) was utilised. Details about the research sampling criteria are provided later in this section.

The various data sources were carefully selected to provide a range of data that would shed light on the research questions from a number of angles. It was necessary to identify the most appropriate informants within the industry who were concerned with the education and training of the merchant ship officers; those who not only had the appropriate information but were also willing to share their experiences and views which in turn could shed light on the research topic.

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<sup>29</sup> The International Association of Independent Tanker Owners (INTERTANKO) is the association of owners of independent tankers in the world, with the objective of developing and promoting best practice in all sectors of the tanker industry.

After extensive elaboration of the research questions, with the guidelines and advice I received from my supervisors, a decision was made to interview four categories of informants. These were experts from maritime organisations, ship owners and ship operators, merchant ship officers, and trainers (see Figure 4.1). For the purpose of this research, these are considered as the key informants whose perceptions would provide information about the skills and competency gap of the merchant ship officers.

**Figure 4.1 Interview Table**

<b>Interviewees</b>	<b>Number of interviews</b>
Shipping Companies & Ship Management Companies	14
Maritime Organisations	8
Maritime Institutions	12 (within eight Training Institutes)
Merchant Ship Officers	27

In selecting the shipping companies, I used certain criteria, including whether the companies had ships operating under FOC and multinational crew. The shipping companies were selected purposively and the issue of accessibility of the shipping company was a challenge which I overcame through the use of the snowballing method, details of which are discussed later in this chapter. There was a potential for bias in the use of the snowballing method, particularly the risk of oversampling a particular network of peers. Being conscious of this issue, I tried to avoid it by keeping to my predetermined selection criteria among those who were introduced through snowballing. Considering the wide range of shipping companies in different parts of the world operating under different structures and strategies, selection was a challenge. Therefore, the sample might not be representative of all types of companies in the industry and it is likely that those companies who agreed to participate in this research were more likely to have well-defined training provision.

The seafarers were selected from those shipping companies that were interviewed, based on their availability and their ranks, details of which are discussed in section 4.7.1.4. At the outset of the research, consideration was given to whether officer cadets should be included as a potential target group of informants. After consulting with training experts within the industry, it was decided not to include this group and instead focus on the officers who were in a position

to take a more informed view and reflect on the research question, having both experience of cadetship, as well as real world practice. It was perceived that officer cadets who were still in the process of undergoing training, or even those who had just completed it, lacked the experience of real practice that would enable them to perceive and reflect on any potential gap.

The selection of training institutes was less challenging than selecting the shipping companies. The criteria for selection were that the training institutes provided a full range of training courses to cadets and officers and came from different MET systems under various socio-economic conditions. The sample included training institutes from TMNs with a high standard of training, two major global shipping labour suppliers, i.e. a newly-emerging labour supplier country with a reputation for a low quality of training and a major training supplier with a reputation for high quality training. Other samples came from a country that mainly supplies the workforce for their national fleet. Therefore, the training institutes were purposively selected from those who met the criteria and were willing to participate in the research. Moreover, access to the training institutes was found to be relatively easy. This issue is further discussed in section 4.7.1.5.

The accounts of three stakeholders, ie the ship owners, officers and trainers, are directly reflected in the data chapters. However, since the maritime organisations' involvement with training issues is mostly concerned with policies, the interview data received from them was only used for the purpose of gaining a holistic understanding of the issues.

As mentioned earlier in this chapter, in addition to collecting data through semi-structured interviews, for the purpose of this study I used documentary analysis. The documents I was interested in were:

- those that detail the regulations regarding maritime education and training adopted by the IMO;
- those that denote the sets of regulations and recommendations regarding maritime education and training adopted by organisations other than IMO. This includes special training requirements adopted by organisations such as INTERTANKO and SIGTTO for officers working on board tankers and gas carriers;



- maritime administrations' documents regarding organisation, rules and regulations as well as the implementation process of the international standards for maritime education and training, such as STCW;
- details of the organisation, course content, curricula and quality systems of training institutes as per requirements of the STCW;
- shipping companies' official documents about the education and training of officers, both ashore and on board.

A comprehensive examination and analysis of the relevant documents helped me to lay the grounds for a detailed fieldwork data collection and analysis.

Next, the samples selected for the interviews and the document analysis, and the rationale for their selection is presented.

#### **4.7.1 Data Sampling Rationale**

With regard to the sample size, Patton (2002) states that “qualitative research tends to use smaller samples than quantitative research, but there are no rules for sample size in qualitative inquiry” (p. 244).” However, Gough and Conner (2006) and, Terry and Braun (2011), cited in Braun and Clarke (2013, p. 55), indicate that a sample size of 15 to 30 individual interviews is common in qualitative research. Another means for determining whether the size of a data sample is adequate is whether the state of ‘saturation’ has been reached. According to Bowen (2008), Morse (1995) and Sandelowski (1995), cited in Braun and Clarke (2013, p. 55), saturation occurs when additional data fails to generate new information.

In the case of my research, the total number of the individual interviews exceeds double the norm indicated by scholars, as stated above. While the number of ship owners and trainers interviewed (14 and 12 respectively) are close to the lower figure of 15 in the sample size mentioned above, the number of officers interviewed (27) approaches the upper figure of 30. Towards the end of the interviews I felt that the data collected was showing signs of repetition, so the research could reasonably be regarded as approaching the ‘saturation’ point. The study utilised 61 semi-structured interviews with the key stakeholders, i.e. 14 shipping companies (including ship management companies), eight maritime colleges, eight maritime organisations and 27 seafarers, across the UK, Cyprus, India, Iran and the Philippines. Interviewees were

officials and policy makers of the organisations, managing directors, operations managers, crewing managers, technical managers and seagoing officers of the shipping companies, and directors, principals and curriculum leaders of maritime training institutions (see List of Participants in Appendices 2a – 2d). The majority of the interviews (53) were conducted in the first phase and eight interviews in the second phase of the data collection.

One of the greatest challenges was how to select the specific countries to sample, the organisations where I could obtain appropriate data and the number of interviewees from each category of stakeholder (ship owners, officers and trainers). In order to sample from a diverse group of stakeholders, many considerations needed to be taken into account when selecting sources and choice of data samples. These included the scope of the research, considerations on available time (duration of the research), financial limitations, difficulties in getting ‘access’ to the organisations, plus the geographic diversity of the shipping companies, training institutions and merchant ship officers.

Interviews with IMO officials helped me to examine their perceptions and concerns with regard to the research problem as well as the strategies they adopt in order to address any perceived problems. Interviews with the shipping companies and ship management companies helped me to understand their perceptions about the skills and competency gap of the merchant ship officers. Interviews with seafarers helped me to explore their ideas about the quality of training they receive and their perceptions of their own skills and competency gap, as well as that of their fellow seafarers. Interviews with Merchant Navy Training Board officials, as the national coordinators of recruitment and training of officer seafarers, helped me to reveal difficulties and challenges involved in the process of training and recruitment of the officers in one of the pioneer nations in the area of MET. Additionally, the trainers’ accounts revealed their perceptions about the skills and competency gap of the merchant ship officers and shortcomings in the contemporary MET system.

#### **4.7.1.1 Choice of Countries**

As stated earlier in this chapter, the study utilises semi-structured interviews with key stakeholders, from the UK, Cyprus, India, Iran, and the Philippines. These countries are selected for the following reasons:

**The UK:** As the research was being carried out in the UK this was a convenient location in which to conduct interviews. Secondly, the UK is one of the reputable countries, globally

recognised for providing a high standard of training to seafarers. Thirdly, the IMO and most of the other pioneer organisations concerned with the MET of the seafarers, who were also targeted to be interviewed, are based in the UK. Therefore, they were easily accessible. Finally, the UK represented a TMN in the samples.

**Iran:** Due to my work experience of over two decades being largely based on board Iranian ships, I knew a wide range of people in the Iranian shipping community. Therefore, I was able to establish contact with the gatekeepers and get access to the interviewees. Also, in order to encompass the diversity of the shipboard organisations, crew complements and MET system, it was planned to collect and include data from a country where the majority of ships fly the national flag and are manned mostly with national crew. Iranian shipping companies have these characteristics (see Appendix 2a – Participants List).

**Cyprus:** This country emerged as the result of the snowball method of getting access to the informants and was the location of the headquarters of a shipping company whose gatekeepers showed willingness to contribute to this research. The company possessed relevant criteria for this research such as having a fleet of ocean-going ships, multinational crew complements and ship owners involved in the education and training of their workforce.

**The Philippines:** According to Drewry Maritime Research and Consulting Services<sup>30</sup> research manning report (2015), the Philippines, supplying about 218,000 seafarers annually, is the largest global shipping labour supplier. The Philippines merchant officers do not have a good reputation in terms of quality and competency but are “viewed as good value for money” (Drewry 2015).

**India:** Again, according to Drewry Maritime Research and Consulting Services manning report (2015), India, supplying more than 104,000 seafarers annually, ranks third in the global shipping labour supplier list. Indian merchant officers enjoy a high reputation with respect to their quality and competence (Drewry 2015).

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<sup>30</sup> Drewry maritime research and consulting services is a leading independent provider of research and consulting services to the maritime and shipping industry.

#### 4.7.1.2 The Organisations

The following provides a rationale for selecting the organisations interviewed for this research:

- 1) **The IMO**, being the highest international regulatory body with a global mandate to set up the STCW Convention requirements, is one of the principal key informants with regards to this research.
- 2) **MNTB** is a voluntary body responsible for the maritime education and training of the workforce for the merchant navy in the United Kingdom. It is selected as a key informant organisation, pioneering the MET system of one of the TMNs with the highest standards of education and training for merchant ship officers.
- 3) **BIMCO** is the international shipping association representing ship owners. This organisation is a pioneer in studying the global shipping labour market and skills shortages.
- 4) **ISF**<sup>31</sup> is the international employers' organisation dedicated to maritime workforce issues. This organisation collaborates with BIMCO in conducting regular research on skills shortages of seafarers on a global scale.
- 5) **SIGTTO** is an international organisation whose mission statement includes developing best operating practices and guidelines, sustaining a learning environment and promoting training and development within the industry in order to promote safe, environmentally responsible and reliable shipping and terminal operations for liquefied gases. This organisation is a pioneer in designing and launching extra training standards (on top of the STCW Convention requirements) for the seafarers working on board LPG<sup>32</sup> and LNG<sup>33</sup> ships.
- 6) **INTERTANKO** is the association of the owners of independent tankers in the world with the objective of developing and promoting best practices in all sectors of the tanker

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<sup>31</sup> ISF is now part of the International Chamber of Shipping (ICS). The ICS is concerned with technical, legal and policy issues that have an impact on international shipping.

<sup>32</sup> Liquefied Petroleum Gas (LPG) tankers

<sup>33</sup> Liquefied Natural Gas (LNG) tankers

industry. This organisation is also a pioneer in adoption of the highest practicable standards for training of the seafarers working on board tankers (other than LPG and LNG).

- 7) **Trinity House** is the organisation committed to the education, support and welfare of mariners and their dependants. This organisation is selected due to the relevance of its activities to the education and training of seafarers.

#### **4.7.1.3 Shipping Companies and Ship Management Companies**

There are three criteria in the selection of shipping companies. The first one is availability and getting access through ‘snowball sampling’. The second criteria is including companies in the interview list with a multinational crew complement operating ships under a Flag of Convenience (FOC) as well as the companies deploying national crew sailing under a national flag. The third is the size of the company. In research carried out by Fraunhofer (2013) the research results show that there is a correlation between the size of the company and the operational issues they encounter. In their categorisation they state that more than 1,500 companies globally manage more than ten vessels each. Only 150 manage more than 40 vessels, which results in a long tail of mid-size companies. “These ship managers in total manage approximately 25,000 – 30,000 vessels, which leave another 20,000 vessels managed by smaller entities (p. 7)”. I decided to use the same categorisation as Fraunhofer (2013) because I needed a wide range of shipping companies to interview. The idea of categorizing the shipping companies to small, medium and large emerged during the course of data collection. The preliminary data showed signs of variance in shipping companies’ policies regarding education and training of the seafarers and their response to the skills gap of the officers, dependent on the company’s size. This issue is further discussed in the Discussion and Analysis chapter.

#### **4.7.1.4 Merchant Ship Officers**

The merchant ship officers were mostly selected from the list of active officers of the shipping companies interviewed. All of the officer interviewees are senior officers and consideration was given to including diverse nationalities. (See Appendix 2b - Participant List – Officers).

Senior ranking officers were chosen because it was perceived that they could not only reflect on their own education and training during their cadetship and through all stages of their career

up to the higher ranks, but they could also reflect on the knowledge, skills and any perceived gaps in the competence of their subordinates.

#### **4.7.1.5 Training Institutions**

The training institutions selected for interview included four from the UK, being representative of TMNs that are commonly perceived as providing high training quality; one from the Philippines, as the biggest global shipping labour supplier and where there are international concerns about the quality of training; one from India, as a major officer supplying country with high training quality; two from Iran, representing a country with a dominant national fleet and national crew and minimum multinational crew complements, where the training institutes were mainly involved with education and training of the national seafarers.

### **4.8 Data Analysis**

The previous section has outlined an account of the data collection process. While acknowledging the interactive relationship between data collection and data analysis, I now come to a systematic description of the data analysis process in this section. I first discuss the nature of qualitative analysis with reference to the methodological literature, and then proceed to describe the data analysis procedure undertaken in my study.

Coffey and Atkinson (1996) consider qualitative data analysis as the representation or reconstruction of social phenomena. They consider it as the process of making sense out of the data. According to Bassey (1999, p. 84) qualitative data analysis constitutes “an intellectual struggle with an enormous amount of raw data in order to produce a meaningful and trustworthy conclusion which is supported by a concise account of how it was reached.” Patton (1990) argues that there is both ‘art’ and ‘science’ to qualitative inquiry generally, and to qualitative analysis specifically. “There is a part of qualitative analysis that is highly creative, depending on the insights and conceptual capabilities of the analyst. But there is also a technical side to analysis that is analytically rigorous, mentally replicable, and explicitly systematic” (p. 462). The technical side of qualitative data analysis points to analytic procedures. Wolcott (1994) argues that describing, analysing and interpreting are involved in the data analysis process, which is not linear. The data analysis process moves in analytic circles with various facets including data managing, reading and memoing, classifying and interpreting, and visualising and representing (Creswell 1998).

There are many different ways to approach qualitative data in order to produce a rich analysis, none of which is superior to the other; rather more relevant and suitable depending on the type of research and objectives of the analysis (Dey 1993; Coffey and Atkinson 1996). Qualitative data analysis is the process of data manipulation through which the researcher discovers and examines concepts, themes, events and topical markers embedded within. With the ultimate aim of integrating these themes and concepts into a concrete area, the researcher provides answers to the research questions (Rubin and Rubin 2005). The coding and analysis approach to answering specific research questions (Mason 2002) is the one that I consider most relevant and suitable to the data that I collected in the field. In this process, I utilize a coding technique for categorisation and cross-thematic analysis of interview transcripts (Strauss 1987).

Coding is the process of going through all the transcripts and then allocating a label or mark to each data unit where matching concept, theme or event appears. Coding allowed me to quickly locate excerpts from all the interviews that refer to the same concept, theme or event and then examine them together (Rubin and Rubin 2005). Once coding was achieved, the data was ready to be interrogated and systematically explored to generate meaning (Delamont, 1992). Delamont suggests that one should be looking for patterns, themes, and regularities as well as contrasts, paradoxes, and irregularities. Coding can be done either by a computer or manually (Coffey and Atkinson 1996).

In the course of data analysis, upon preparing transcripts of interviews, concepts and themes were found, refined and elaborated. In the next stage, identified concepts, themes and events were compared and/or combined across the transcripts. In so doing, I was able to produce accounts based on the research question (Rubin and Rubin 2005). Such cross thematic analysis helped to identify patterns in the data and examine the links between the themes and concepts in order to reach the ultimate thematic integration and be able to answer research questions. Cross-thematic data analysis was effective in revealing the complex web of inter-relationships between social themes and it exposed the complexity of the research question within the shipping industry (Dey 1993).

I obtained data from a range of shipping companies, officers and training institutes located in different parts of the world, details of which are discussed in the data sampling rationale. However, the idea was not to have a country-specific study of the competency issue but to look at the competency of the officers on a global scale. Therefore, the data that emerged from the

interviews were mainly collated and analysed based on the informant groups, i.e. shipping companies, seafarers and trainers and not according to the country where the data originated.

Data are presented and ordered in the empirical chapters under headings corresponding to the first three research questions listed in section 4.1. Under these headings, themes are listed in order of importance, determined by how frequently the topics emerged during the interviews. In analysing the data, I took note of the priority given to topics by different informant groups (i.e. which answer was given first) and also focused on whether there were any inconsistencies or paradoxes in the answers.

Tesch (1990) describes qualitative analysis in terms of decontextualization and recontextualization. In my data analysis process I intended to follow the flow pattern from colour coding to thematic deconstruction whereby I could break up the notes into different thematic categories, study each individually and finally reconstruct a coherent and logical account that answers my research questions. According to Coffey and Atkinson (1996), “Writing and representation is a vital way of thinking about one’s data. Writing makes us think about data in new and different ways.” However, there is no single best way to reconstruct and represent the social world (Hammersley and Atkinson 1995).

To make the data analysis more thorough I employed Computer Assisted Qualitative Data Analysis (CAQDAS) using Nvivo software that is available via the Cardiff University network. The advantage of using this computer software is that it helped me in detailed coding, categorising and identifying of all thematic similarities that my eye and memory could easily miss. This also made the cross-thematic analysis easier and more accurate. Moreover, it made it easier for me to identify similarities and differences between the sets of data; i.e. data from documents and interview data.

## **4.9 Ethical Considerations**

Many researchers have raised issues, and formulated guidelines and principles, concerning the ethics of researching social science and human subjects with respect to the different phases of the research process (Robson 2002; Bryman 2004; Gray 2004; Payne and Payne 2004). Bryman (2004) points out that scholars often differ quite widely over ethical issues and questions; in other words, there is no consensus over what is and is not ethically accepted. However, they all put emphasis on the responsibility of the researcher to be conscious of the ethical issues of



the research. Observance of ethical principles constitutes an important aspect of professional integrity (Gray 2004). Gray suggests that the ethics of research concern the appropriateness of the researcher's behaviour in relation to the subjects of the research and those who are affected by it. Since social research in the real world inevitably deals with people and the things that affect them, ethical issues can arise at the planning, implementation and reporting stages of research (Gray 2004). There are certain behaviours in research, such as causing harm to individuals, breaching privacy and confidentiality, using information improperly, and introducing bias, which are considered unethical in any profession (Kumar, 1996; Christians 2000). Bryman (2004) categorises ethical issues into four main areas; i.e. harm to participants, lack of informed consent, invasion of privacy, and deception. According to Bryman (2004, p. 509) harm can entail a number of facets: physical harm, harm to participant's development, loss of self-esteem and stress.

In recognising that the study at different stages directed me to a variety of individuals, groups and institutions, it was essential that I took a thorough look at ethical issues at a very early stage of my research. Hence, I made myself acquainted with the guidelines of the Cardiff University ethics committee to which I submitted my research proposal and outline of my research methods, for review and approval. I became eligible to pursue my research only after I received Ethics Committee approval. Moreover, questions about ethics in social research also bring in the role of professional associations such as the British Sociological Association (BSA) and the Social Research Association (SRA), which have formulated codes of ethics. I made myself familiar with these codes and, where applicable, used these guidelines throughout my research.

One of the most important concerns within this study is the issue of 'informed consent'. This principle means that prospective research participants should be given as much information as might be needed to make an informed decision about whether or not they wish to participate in the study (Gray 2004; Bryman 2004). In order to fulfil this requirement, I prepared an information data sheet and a consent form provided to all participants (see Appendices 4 and 5). Prior to any participation in this research, they were given the opportunity to become acquainted with the research topic, scope and intention and, should they wish to participate, make an informed decision by signing the consent form. For those participants who were interviewed by telephone, they received and signed their consent form via email.

The other area of ethical concern relates to the issue of respondent confidentiality. According to Bryman (2004) this is linked to the issue of anonymity which should be respected in the research process. In the case of qualitative research, particularly concerning face-to-face interviews, it is essential to ensure that the connection between information and participants is only known to the researcher and does not become public. The essence of anonymity is concerned with non-traceability so it is critical to ensure that participants cannot be identified by another person from findings used in public documents.

Operating ships is a complex activity involving many people with different interests, commercial sensitivities and competition priorities. Therefore, when approaching IMO experts, maritime administrations, other maritime organisations such as BIMCO, and training institutes, it was extremely important to assure the gatekeepers of anonymity and the confidentiality of their information. In order to obtain unbiased, robust and valid information from the ship officers, they, too, needed to be assured of anonymity and confidentiality. Therefore, I disguised all identities very carefully. As Christians (2000) points out, the data gathered through the research “ought to be secured or concealed and made public only behind a shield of anonymity.”

The shipping companies’, seafarers’ and the training institutes’ names are all concealed and coded throughout this thesis. These codes are annexed to this research (see Appendices 2a, 2b and 2c). In the case of the participants from maritime organisations, the role and position of the interviewees are not provided since their identities could be recognised within their organisations (see Appendix 2d).

Overall, I approached my research well aware of my duties and responsibilities towards the participants, sources and research community.

#### **4.10 Anticipated Difficulties**

Undoubtedly, as in any other research, there were some issues that I identified as potential difficulties in conducting and completing the thesis which I have tried to avoid. One of those difficulties was ‘access’. Negotiating access to the various interviewees was not easy. There are people in maritime administrations and organisations, shipping companies and training institutes, who constantly claim to be ‘too busy’. While I intended to communicate my objectives in a professional manner and assure my respondents of the good intentions of the

study, I had to ask them for the minimum time which they could spare on conducting interviews. Having looked at similar research conducted by Gekara (2008) I realised that negotiating with gatekeepers and getting access to stakeholders within the shipping industry is challenging. Gekara states that out of 90 letters he sent out to his research target groups in shipping companies, training institutions and maritime organisations, asking for interview appointments, he received only 15 replies. Out of those who replied, he received only seven positive responses. I experienced the same when I commenced access negotiations. However, the use of ‘snowball’ sampling helped me to increase positive responses from gatekeepers. Since I was introduced to them through a third party who were known to the gatekeepers, my success rate in making appointments improved.

Another important challenge was the time limit for the completion and submission of the thesis. This was influential in limiting the scope and depth of the study. At the same time, it was decisive in determining the sample size and, as far as practicable, selection of the samples in close proximity to the researcher.

Another difficulty was anticipated to be financial limitations. My research involved a lot of travelling which incurred heavy costs. I needed to travel within the UK as well as visit other countries. This issue meant that my travelling to all of the target countries was restricted and some of the interviews were conducted over the telephone.

As I stated earlier in this chapter, one of the difficulties I encountered in a few cases was when the interviewees refused to let me record the interviews. I was faced with the challenge of note taking and keeping focused on the influx of information I was receiving. I had to be focused not to miss any important data, and at the same time think of the appropriate probes and questions to smoothly and logically pursue the interview.

It is necessary to mention that not all of the hindrances and burdens were identifiable from the outset of the research. In my case three unforeseen misfortunes happened that affected my timely research. An unforeseen issue was the major changes made to the STCW Convention during the course of my research that obliged me to schedule a second stage of interviews. I also faced several health issues which were mostly as a consequence of the injuries I had sustained during more than twenty years of working at sea. Moreover, my father passed away and the situation became very complex and it took me a considerable time to overcome the turmoil.

## **4.11 Summary**

The ‘constructivist’ approach adopted for this research holds that the social world cannot be measured with precision and the researcher in the real world must seek to discover how people understand and relate to their world and how they create and share meaning about their lives and work. Hence, a qualitative research strategy is deployed and a semi-structured interview method is used to give voice to the interviewees to express their views about the skills and competency gap of the merchant ship officers. The main actors in the industry involved with the education and training of the shipping labour force, consisting of sixty-one experts from maritime organisations, shipping companies, merchant ship officers and maritime training centres across five countries are identified and interviewed. Additionally, document analysis is used as a second data collection method for this research.

Chapters Five, Six and Seven are dedicated to the data collected through the semi-structured interviews with the ship owners/ship managers, merchant ship officers and trainers.

# CHAPTER FIVE

## Research Findings: Employers' Accounts

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### 5.1 Introduction

Qualitative data obtained from interviews with employers, i.e. shipping companies and ship management companies, as the ship owners' representatives, is presented in this chapter and the prominent issues and concerns raised by these informants with regard to the research questions and the aims of the study – i.e. the skills and competency gap of the ship officers - are discussed. For this purpose, the following research questions were addressed through the qualitative interviews:

- 1. What informs the ship owners' perceptions, concerning the ship officers' skills and competency gap?*
- 2. What is the nature of the perceived skills gap, as understood by informants?*
- 3. What are the impediments to the education and training of the officers, as perceived by the ship owners?*
- 4. Are the perceived gaps between the training being provided to the officers and the actual skills they need to perform their assigned duties adequately addressed by ship owners?*

The employers' responses to the first three questions are discussed in this chapter and their answers to the fourth question form part of the Discussion and Analysis chapter.

All of the research findings within this chapter are based on the data collected and analysed throughout the first stage of the empirical data collection.

## **5.2 What Informs the Employers' Perception About the Skills Gap?**

During the course of interviews with the ship owners, ship managers and the organisations representing the ship owners, almost all of the interviewees, in one way or another, expressed the view that a considerable population of the officers in the present global shipping labour market are of a 'poor quality'. In forming such an opinion, most drew upon a range of different factors, while a few interviewees could not cogently elaborate on their views. The views offered were typically founded upon information disseminated in the professional publications combined with what the interviewees had heard from others' experiences or allegations within the industry (referred to as 'grey literature'), as well as on their own observations.

This section will begin by looking at the main sources through which the ship owners and ship operators build up their perceptions about the quality and level of competence of the officers and consequently make their judgments about the quality and adequacy of the contemporary maritime education and training systems. These include various reports they receive from internal and external sources, such as accident reports, audit reports, technical and commercial department inspection and performance reports, personnel appraisals, as well as Port State Control reports and ship detention rates.

### **5.2.1 Accident and Incident Reports**

It is frequently reported that more than 80 percent of maritime casualties and ship accidents are attributable to the so-called 'human element' (Goulielmos 1997; Emad 2011). There are many factors to the human element (see section 2.6) and failure of these can lead to 'human error', resulting in accidents. In investigating accidents, training is one of the main factors to come under the spotlight (IIMS 2014, p. 34) Reducing accidents depends on "knowledge, skill and just as importantly, attitude", according to the Indian Maritime Administration authority (Fonseca 2014, p. 1).

The employers interviewed regarded the accident and incident reports as one of the main indicators of the skill and competency level of the seafarers. One of the senior operations managers stated that:

Our technical department and the safety and quality department do their analysis on the accidents and incidents that occur on board our vessels. The reports indicate that mostly the lack of knowledge and competency of the seafarers' are the main cause of the accidents...It seems that the officers are either not adequately trained or not able to do the right thing when it is necessary to take an action or make the right decision, they fail. But, in any case, what matters to us is that the officer in charge has not been 'competent' to avoid the incident...Of course, there are different reasons for each individual case but we always find a human error in the accidents...One of the main root causes is always inadequate training. So, we realise that the quality of training of the officers is under question. (SC3)<sup>34</sup>

The managing director of a shipping company emphasised the gap between the education and training being provided to the officers and the competence and skills he expected them to have on board ships. By giving an example of a recent incident that occurred on board one of his ships, he claimed that such incidents informed his perception of the quality of the present officers on board ships and in the shipping labour market in general:

We don't get quality seafarers due to a lack of qualified crew. One of our ships, we have to spend almost 700,000 Euros only on the main engine's liner, whereby it could be easily prevented with proper maintenance on board, and these are the things which we are facing with. This is ignorance and lack of knowledge and skills of officers on board. So, these things result in huge financial losses to the company, and that's a big issue and that's a big challenge for us...companies like us [small company] do not have enough resources to train these people or invest in training, to bring them up to a good standard...that finally is going to cost us quite a lot. So, we have to rely on the crewing market and crewing agencies. For that reason, you know, we have to suffer these kinds of losses. This is why I say the quality of the officers is declining. (SC1)

This account clearly indicates that although the ship owner is aware of the advantages of investing in training, he claims that limited financial resources prevent his company from doing so.

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<sup>34</sup> SC: Shipping Company – this code identifies the ship owners' accounts – see Appendix 2a

## 5.2.2 Ship Superintendents' Reports

Shipping companies normally have their fleet operations monitored by technical superintendents. The daily operations of the vessels are recorded in the deck and engine logbooks and procedures are in place to periodically send the information to the relevant departments ashore. The superintendents are responsible for scrutinising the ship reports and evaluating the ship's performance. It is also part of the superintendent's job to visit the vessels in ports and to observe the actual shipboard performance and maintenance condition of the vessels. Hence, the superintendents' observations and reports are considered to be of great value to the ship owners and ship managers, helping them to evaluate the performance of the shipboard personnel.

In the following excerpt the technical manager of a shipping company has mainly based his views on officer quality on the periodical reports and analysis he receives from his subordinates within the technical department:

When we analyse the reports it is not too difficult to see that most of the time the personnel either do not have knowledge and skills to do the job or they are ignorant...Many of the technical jobs can easily be handled by a good engineer. They are supposed to be trained for those jobs but we can see that the ship staff are asking us to arrange for the shore workshops to go on board and do the repairs...Our superintendents have their schedule for visiting the vessels and they find a lot of problems on board ships during their visits. Many times the superintendents' reports reveal that the on board officers have made fake reports. We cannot tolerate with such things. We sack those who do that...Sometimes our experienced superintendents go on board and help the crew to carry out a job but the superintendents in their report state that the personnel were not familiar with doing the task. This is a tragedy. The ship officers should know their job but sometimes they don't! We rely on those people to take our ships to sea but the evidence shows that they have problems with their training and practical works. (SC12)

A fleet manager also identified superintendents' reports as the means by which his perception of the officers' skills gap and level of competency was informed, stating:

...we try to have our ships to be visited and inspected in ports by sending our superintendent to see what the level of the ships' maintenance are. Also with regard to the targets that we have set for that specific ship and a voyage, both commercially and



technically, they observe and report to us. They come up with both deck and engine inspections and the voyage performance [reports]. They scrutinise deck and engine log books on board and in office. They sometimes ask ship personnel technical questions. The reports show that the number of false reports in the log books and ship reports are increasing. The superintendents' pinpoint discrepancies when comparing the reports against the actual thing they observe on board...Superintendents' report is one of the basis to pay bonus to the on-board personnel, and they [crew] know that. But, still the problems are there. We have made the motivation for them to show their better performance for the rewards but my perception is that they are not able to perform any better. For us this trend means lack of knowledge and skills. Performances are not satisfactory and the company is paying for that. (SC8)

This statement indicates that the company considers the superintendents' reports to be an important means, not only of monitoring ship condition, but also of evaluating the performance and competency of their shipboard workforce.

### **5.2.3 Commercial Department Performance Reports**

The commercial performance of ships and the reports being produced by the commercial departments, indicating whether or not the profit-making objectives for a specific period of time have been achieved, are another means of building up the ship owners' and ship operators' perceptions about the skills gap of the ships' officers. A managing director stated that:

...For us very short turnaround time is important. So, whether the vessel has been delayed or not, had less off-hire and better turnaround times are important. In several cases we find the reason for the ships' delays in commercial activities are due to the problems we have with the officers' performance on board. For example, the ship's tanks or holds are not ready for cargo loading, or vessel cannot pass the vetting inspection on board our tankers, or cranes are faulty, etc, etc. They get the facilities and tools and what they need to perform the job, but they don't do them properly. We are paying bonuses to our crew and officers for better performance but they are not doing their job properly to get the bonus. And obviously that reflects the level in which really they maintain the ship and they perform the voyage. (SC1)

A fleet director, in expressing his concern about the incompetence of some of the officers in technically maintaining the ship in an optimised condition for better commercial performance, stated that:

We try to provide all facilities to the vessels. Our technical department supply the vessels according to the indent orders but when we need the vessel to be ready to sail to a destination to load a cargo which has been booked in this very competitive market, we either find the vessel delayed in arriving at the load port, machinery breakdowns or the cargo hatches and tanks not ready to load cargo...Sometimes we find the vessels not maintained as they normally should be, despite providing all spare parts and equipment. When the vessel is not technically ready and sound and not maintained properly, the commercial activity of the vessel, which is our ultimate goal in this business, is adversely affected and at risk...This is why we perceive that some of the officers are not competent to do their job. (SC7)

Taking into account the above statement, the ship owners perceive a significant correlation between the maintenance and commercial activity of their vessels. While it is a controversial issue to find out the reasons behind the lack of proper maintenance of the ships, according to the ship owners' and ship managers' statements, technical preparedness and the officers' knowledge, skills and competence in commercial topics and activities are important factors affecting the achievement of commercial targets. This is an area in which they perceive a knowledge and skills gap and they attribute this gap to improper education and training received by the officers prior to their certification and also to insufficient, or lack of, experience.

One interviewee (a commercial manager and former ship captain) identified the ship's officers' lack of knowledge and experience as the reasons why his company had incurred commercial losses:

We have faced with many cases where our vessels have been ready by all means to load cargo but bad performance of the officers have either delayed the ships at ports or incurred damages to cargo and/or to the vessels. Sometimes the officers have not sufficient knowledge for loading specific cargos. They cannot make cargo plans or compose loading sequences properly...Sometimes, specifically on board general cargo ships, they [the officers] don't know how to load and secure the cargo properly. Although the loading gangs are mostly experienced but our officers, due to lack of

knowledge and experience, do not know how to use the loading squads expertise and experience, though, from our point of view, the ship officers are responsible for proper and safe loading and discharging. The loading sequences, loading and de-ballasting at the same time, optimising loading by utilising all of the ships facilities and capacities, planning for bunkering in order to optimise the ship cargo lifting capacities are some of the issues we find our officers not properly trained for. Some of these items might be trained in theory, which still I doubt it, but there is a big difference in what they learn in classrooms and what they experience in reality on board ships...Some of the issues I mentioned such as planning for bunkering to optimise lifting capacity of the ship come only by experience. Personally, I have not seen anything like that to be taught in the classrooms. (SC14)

The commercial performance of the vessels is a complex issue and there are many factors that may influence the commercial performance. However, from the ship owners' point of view, one of the key factors that directly affects the ship's performance is the competency of the shipboard personnel and their capacity to turn their knowledge into practice; especially the key personnel and the officers who are directly involved with the shipboard operations and decision-making. During the course of the interviews, the informants acknowledged that other factors could influence the commercial performance of the vessels, such as the capabilities of shore-based personnel, but the key on-board factor affecting the ship's performance was claimed to be the officers' competency and their skills in responding to the voyage instructions and handling the commercial activities. They further claimed that the STCW Convention does not sufficiently address the education and training that is needed to perform the shipboard commercial undertakings.

#### **5.2.4 Safety and Quality Officers' Audit Reports**

According to the International Safety Management Code (ISM Code)<sup>35</sup> all shipping companies are required to have an internal auditing procedure within their safety management system, in order to assess the safe performance of their ships as well as their shore-based personnel.

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<sup>35</sup> International Safety Management (ISM) Code is the International Management Code for the Safe Operation of Ships and for Pollution Prevention. This Code is part of the SOLAS Convention (Chapter IX).

(Anderson 2015). A safety and quality (S&Q) department within a shipping company is normally established to undertake the requirements of the ISM Code.

The head of the S&Q department of one of the shipping companies stated that when the competence of shipboard personnel was examined during internal audits, the S&Q officers had observed that although all personnel had certificates of competency that had been checked prior to their boarding the vessel, these did not accord with the actual competency displayed by the seafarers.

During the course of an interview, an S&Q manager of one of the shipping companies presented examples of the internal audit reports and the non-conformity note one of their fleet vessels received from the S&Q auditor due to the inadequate competency of two of the officers during the audit interview. In his report, the company's S&Q auditor stated that:

In order to observe the ship personnel capability to use the emergency fire pump, the responsible officers were asked to demonstrate their ability in taking timely action to start up the emergency fire pump. However, the engineers were found not conversant with the procedure of the emergency fire pump start up and this is considered as a threat to the safety of the vessel. (SC6)

Another report by one of the S&Q auditors revealed that one of the officers was not conversant with his essential shipboard duties, despite holding a valid Certificate of Competency:

...I asked the 2<sup>nd</sup> officer to show me the nautical charts and the corrections applied to them. I randomly checked the charts and found them not updated according to the latest admiralty chart correction notices. I asked him to explain to me about the reason for not correcting the charts and he said that he is not trained to do that and neither during his cadetship nor when he was a 3<sup>rd</sup> officer he had the chance to practically learn and do the chart corrections. This is considered as lack of basic knowledge required by the STCW Convention for a Class III Certificate of Competency holder. This is a non-conformity with the requirements... (SC6)

As can be observed from the S&Q auditor's report, the navigating officer had not been suitably trained for undertaking one of the basic tasks which is crucial for the safe navigation of the vessel. This evidence suggests that in this specific case there was a fundamental gap between the education and training provided to the seafarer and the competency and skills he needed to perform his shipboard duties.

The reports and analysis produced by the companies' safety and quality departments, which are mainly concerned with the implementation and assessment of the companies' procedures and the ISM Code requirements, were found to be one of the main sources by which the ship owners build up their perception about the officers' knowledge and skills gap, as observed on board ships.

### **5.2.5 Periodical Personnel Appraisal**

Interviews with the shipping companies and the ship management companies revealed that all of the employers had some sort of periodical personnel appraisal mechanism in place that provided them with an insight about the quality of their shipboard personnel. The employers received this feedback from the master and the chief engineer as the most senior ranks on board ship. The periodical appraisal forms used for evaluating the seafarers throughout a voyage, (undertaken quarterly and sometimes for the overall appraisal of a seafarer during a six-month cycle of contract) was considered to be one of the most important means of assessment for scale of wages, allocating performance-based bonuses and promoting the officers to higher ranks. The crewing manager of one of the shipping companies stated that:

One of the responsibilities of the senior officers is to complete the personnel appraisal forms for all of their subordinates. The Master of the ship approves these appraisal forms prior to sending them to the company. These forms should be filled out and sent to us at least once every 3 months as well as on completion of contract cycle. The evaluation forms are very important to us. They give us the information we need to evaluate the officers for different purposes, including allocating them job performance bonuses, granting them promotion, deciding whether to sign the next contract with them or not and also to find out what are the individual officer's strengths and weaknesses. Our shore-based team scrutinise the appraisal reports and send the reports and analysis to concerned departments...I can say, unfortunately, the reports are not so good and indicate many problems the Masters and the Chief Engineers observe on board our ships, reflecting some sort of lack of knowledge of officers in performing their duties. The superintendents will evaluate even the Masters and the Chief Engineers themselves and the evaluation forms are sent to us. Sometimes we see that even the senior ranks also lack knowledge in their assigned duties...This is how we find out about problems in the training system and consequently with the competency of the officers on board ships. (SC4)

One training manager further elaborated on the specific subjects in which the officers had been found to be incompetent through the evaluation report forms. Those details are discussed in this chapter when examining the nature of the skills and competency gap.

### **5.2.6 Training Needs Applications Received from Ships**

In some of the shipping companies the ‘training needs application forms’ are designed to reflect the officers’ knowledge and skills gap. Senior officers’ observations on the performance of the shipboard personnel are conveyed to the company through filling out these forms for individuals. On some occasions, when seafarers themselves perceive a lack of knowledge in specific areas, they may also personally request senior officers to report their skills gap to the company in order to get the company’s support to attend a course. Upon receiving these applications the companies ‘may’ arrange appropriate training courses to upgrade the officers’ knowledge and skills.

The general manager of the training department of one of the big shipping companies described the process as follows:

We have a procedure on board ships asking the Masters to observe the crew performance and if they see any problem with their training in specific areas we expect them to reflect the skills gap to this department through filling out the ‘training needs forms’ for individuals. We receive quite a considerable amount of training needs forms that indicate problems with seafarers training. The training needs forms are very good tools for us to realise that presently the skills gap, which you are researching about, really exists and the officers are not properly trained and they have actually been properly evaluated prior to their certification. (SC 13)

The above statement raises an important issue regarding the evaluation of the seafarers. It suggests that the ship owners not only have issues with the content of officer training but also have concerns about improper assessment of the seafarers prior to their certification. (See Emad 2011).

It appears from the above statement that the training needs applications are invaluable tools for the ship owners to be kept informed about the competence level of the officers and extent of the skills gaps of the shipboard personnel. The nature of the training being requested through these training needs applications will be discussed below.

### **5.2.7 Results of the Job Applications and the Officers' Promotion Interview Boards**

In the shipping industry, as in other industries, the recruitment procedure starts at the point where job seekers submit their application forms to the employers. In some of the shipping companies, the job applications will be studied and scrutinised and those applicants who are found suitable for the advertised rank will be asked to attend an interview. The applicants will usually be given an oral interview at the headquarters or in the offices of the companies' representatives, in order to examine their knowledge and skills according to their CoCs. Upon successful completion of the interview, the successful officers are sent on board ship. However, their actual competency in performing their assigned duties can only be evaluated in action. According to the research data, not many companies have sufficient resources to undertake the job application interviews. Therefore, these companies have to rely on the CoC of the applicant, hoping that the recruited officer will be competent as it is claimed on their CoC. It means that these shipping companies despatch the recruited officers on board their ships without assessing their abilities in advance.

The statements made by the informants through the research data collection indicate that even those companies that do hold pre-employment oral interviews still encounter problems with the actual competency level of a considerable number of applicants, once they are employed on board ship. Only then does a skills gap become apparent when officers are found to be 'not fit for purpose' and not as skilful as defined by their CoCs. In the shipping companies who did not hold interviews, the dissatisfaction rate was even higher. This issue not only increases the risk and undermines the safety of the ships, but also imposes a lot of direct and indirect expenses on the ship owners.

A fleet general manager of a small shipping company, who heads the job application and promotion interview board, stated that:

I can say that a considerable number of the job applicants who appear for the pre-employment interview fail... Sometimes they do not know even the basics. If we are in control, we reject most of the applicants but sometimes we are short in number of officers and need to recruit quickly; so when there are not many options, we have to take it a bit easy... So, we have to compromise on what we get. These interviews are good indicators for us to know that the quality of the officers has been declining... Quality officers are not readily available in the market because those are

mainly trained by their companies and mostly remain loyal to their companies... What I am talking about is the pool of seafarers we have access to in the current situation. These are mostly from Philippines and South East Asian countries. (SC11)

The skills gap is not just seen among new recruits but is also revealed when officers apply for promotion in their ranks. A senior master mariner, who is the fleet manager of a company, related the following regarding the company's officers who apply for promotion:

According to the company's procedures the officers who apply for promotion need to appear for an interview by the promotion board... Although the promotion applicants are working on board our ships but in many cases, we reject or postpone their promotion and ask them to go on board ship with their current rank and get more experience and reapply after one voyage, six months or even one year, depending on their skills gap... I have failed many of them [officers] several times because even when they fail in the promotion interview they still go on board and do not understand what they need to learn or practice in order to satisfy the promotion board to approve their promotions... I wonder how some of them have passed their competency exams. My experience shows that the number of failures in the promotion exam have been increasing and this fact has already been reported to the senior management and the training department. (SC8)

As can be seen from the informants' statements, the result of the job application and promotion board is one of the gauges by which the ship owners perceive the knowledge and skills gap of the officers.

### **5.2.8 Port State Control (PSC) Inspection Reports and Detention Rates**

Port State Control (PSC) is the inspection of foreign ships in national ports to verify that the condition of the ship and its equipment complies with the requirements of the international regulations, the ship is manned and operated in compliance with these rules and the ship personnel are competent in undertaking their assigned duties. Upon an inspection being conducted by a PSC officer, a report will be produced and the ship owner will be informed about the deficiencies the PSC officer has noticed on board their ship. Some of the PSC inspections result in the detention of a vessel for non-compliance with the regulations and this may cause the ship owners considerable commercial losses.



While the ship owners took their technical departments' role in facilitating proper maintenance of the ships into consideration, they stated that the result of such inspections did not merely indicate how well the vessel was maintained but that a successful PSC result to a great extent depended on the ability and professionalism of the officers in dealing with the PSC inspections. In this way, the ship officers could not only demonstrate to the PSC control inspectors the vessels' seaworthiness by means of machinery and maintenance, but also they could assure them about their skills and competence in safely operating the vessels. The ship owners further claimed that the officers' knowledge and skill could prevent the vessels from detention in many cases, where they could successfully demonstrate to the PSC inspectors that they were aware of their vessel's weakness, but they knew how to control it or safely deal with that condition.

According to the general manager of the S&Q department of one of the shipping companies, the port state control inspection reports were a good means of finding out about the knowledge and skill of the officers on board their ships. He stated that:

In many cases where we study the PSC inspection reports we realize that the ship officers did not have sufficient knowledge and skills to satisfy the PSC officer... We have asked the Masters to contact us in case of problems with the PSC officers' inspection and prior to the closure of the inspection we sometimes give the Master or the Chief Engineer technical advice in order to satisfy the PSC officer about the situation... This is what we expect from the senior officers to know, and if they claim to be competent they should not need our advice. Some vessels are being questioned even for the competency of the officers on board because sometimes during the inspection the PSC officer may think that an officer is not competent and ask him some technical questions. We have this experience and we had to withdraw that officer from manning list and replace him with another officer in order to get permission from the PSC to sail out from that port. It made the ship to be delayed for two days until the replacing officer arrived at port [replaced the previous officer]. These are showing us that there are serious competency gaps that need to be addressed. (SC6)

From the above statement, it can be seen how the PSC inspection reports inform the ship owners about the existing skills gap.

Having looked at the various sources that inform employer perceptions of the skills and competency gap of merchant ship officers, the next section aims to shed light on the 'nature' of the skills gap as perceived by the ship owners.

## **5.3 What is the Nature of the Perceived Gap, as Understood by Employers?**

Based on what has been discussed so far, it is evident that there are considerable concerns about the knowledge, skills and competence of the merchant ship officers. This section will elaborate on the nature of the gaps, as perceived by the ship owners. Research findings that address this question include technical knowledge, practical skills and a range of social and behavioural skills.

### **5.3.1 Technical Knowledge**

Having appropriate and sufficient technical knowledge is essential to handle any technical job and tackling the current generation of merchant ships, with their technologically advanced and sophisticated machinery and controls, is not exempted from such a requirement. Prior to undertaking their job, ships' officers need to be adequately trained and acquire a sound knowledge of the job. This is what the STCW Convention provisions have been set up for and the MET system is supposed to implement in order to train the seafarers from their cadetship up to the highest rank in the seafaring profession. Nonetheless, during the course of the research interviews, the ship owners and ship managers claimed that the technical knowledge of the officers in the labour market was not up to the standard they expected. They attributed such a lack or insufficiency of knowledge to many issues such as inadequate training and the quality of intakes to the industry.

The vice president of the marine division of one of the shipping companies stated that:

The quality of the officers in the market is not what we expect. What we expect from an officer is to be familiar with his job and be able to do it professionally. But unfortunately, in some cases, we have seen that the officers have not sufficient technical knowledge of their job. With new job applicants we can easily realise the insufficiency of some of the applicants' technical knowledge. We ask them a few technical questions during the job interview but some of them seem not to be confident in answering the questions...It seems to us that most of the training centres, especially in some countries such as the Philippines, are not as good as they should be. They are producing a lot of seafarers but the quality of their training, except in some cases, seems to be substandard to us...The ships are having new machinery on board but we receive some reports from our ships that officers are not familiar with them and do not

know how to operate them. The colleges should equip themselves with new workshops but apparently they are not up to date. So, the cadets and officers do not have access to good workshops to practice with the equipment and new machinery and when they join ships it is too late to learn... Maybe the cadets and officers get prepared just to pass the exams but are not really as competent as they should be according to the Certificate of Competency they hold. (SC2)

The above statement raises a number of significant issues which were perceived to be among the factors affecting the quality of the training being provided to the officers. These items were seen as contributing to the gap in technical knowledge of the officers. One of the issues was with regard to the MET system. The way the maritime administrations interpret the Convention and circulate the STCW requirements into their marine colleges and how the training centres set up their curricula and train the officers was a matter of concern. Moreover, the facilities of the training institutes were perceived as being of great importance and significantly affecting the quality of the training being provided to the officers. This issue will be further discussed in this section where the limitations of what can be expected from training are examined.

Ship owners perceived that having access to proper training aids, driven by an appropriate training curriculum, had a significant effect on the objectives of the training and consequently influenced the extent of technical knowledge of the trainees. The employers claimed that the facilities in the maritime colleges were not up to standard and more specifically the workshops and the simulators they deployed for training purposes were not appropriate, resulting in the officers having inappropriate and insufficient technical knowledge and skills.

A training manager stated:

Previously, the cadets had the opportunity of regular ship visits during their training time. This could give the trainees time to interact with the seafarers, go to the engine room, go on deck, go to the bridge and see the machinery and the real equipment. The marine colleges normally had big workshops and facilities for practical training. But now we can see many colleges which are established in small buildings in landlocked cities, away from ports, which do not have any of those facilities. So, where is the space and facilities for the officer cadet to experience? The real workshops have turned to be replaced by the individual machinery PC-based simulators. So, how effective do you think these computer-based trainings are compared to the real-life machinery workshops? I strongly believe that the difference is immense. (SC13)

Another noticeable issue was that some of the ship owners pinpointed the nationality of the officers, considering it as a characteristic by which to classify the output of the training systems. They discriminated between the quality of the training providers and they perceived that skill gaps were more conspicuous in officers who had graduated from specific countries. This perception was normally built up over a long period of time and based on the performance of different national groups. Such generalisations were not only attributed to the training systems of the countries but also to the social and cultural backgrounds of the seafarers. A fleet director stated that:

Officers being recruited from some countries are better than the others...The reports we receive from our ships generally show that the East European countries' officers have good technical knowledge but they have issues with communication and team-working. They prefer working alone. This causes problems on board ship since they cannot make coordination with others. Those from the Philippines are reported to be cooperative and obedient but their skills and knowledge is a concern. (SC7)

The term 'training institute facilities' does not merely refer to the physical facilities but the ship owners perceived that the instructors in the maritime colleges also had a significant role with regard to the quality of the technical training. An S&Q manager stated that:

We receive complaints about training colleges from our cadets and officers when they attend college for their 2<sup>nd</sup> or 3<sup>rd</sup> CoC. They complain about quality of the lecturers and instructors. Some of the officers after completion of their training come to us and complain about the outdated knowledge of the college instructors...Some of the instructors have not been on board ship for more than 20 years. So, they are not familiar with the new generation of ships. They have not personally experienced many things such as manoeuvring of a gigantic container carrier, so how do we expect them to train, for example, our 2<sup>nd</sup> officers attending their class I CoC in the college [management level training course], who has been sailing on board these ships for many years? It is obvious that these issues affect the quality of technical training of the seafarers. (SC6)

From the ship owners' point of view, technical knowledge meant not only having the theoretical knowledge about the workplace machinery and equipment but also being conversant with their actual operation. What is defined in the STCW Convention provisions prescribes the knowledge and understanding the officers need to obtain in their training schemes based on their job and their ranks. However, the appropriate interpretations and implementations of the

STCW Convention requirements remain with the maritime administrations and the countries. Aptitude of the MET system in turning the STCW Convention provisions into the proper training curricula for the trainees and the actual training being provided to the trainees both theoretically and practically are what the ship owners indicated to be their concerns during the interviews. A fleet director stated that:

We can see that a lot of effort is made on the STCW Convention and the experts are regularly trying to update it. But, in many cases the Convention is not very explicit. I also think that the STCW is very generic and only provides the minimum technical requirement for the seafarers. There is much more that the officers need to know. So, the college graduates are basically prepared based on what the Convention has prescribed for them to know and this is just the minimum requirement. In fact, being trained based on the minimum requirements of the STCW is not enough to be an officer on board a new generation ship...Even the colleges are prepared only to undertake the minimum requirements of the STCW Convention. Some of the maritime colleges are even not prepared for those minimum requirements trainings. (SC7)

According to the research data, the ship owners considered insufficient technical knowledge of the officers to be one of the main concerns which they attributed to a diverse range of causes. However, this area of the research findings will be re-examined when the issue of the STCW Convention as the minimum requirement for the education and training of the seafarers is discussed.

### **5.3.2 Practical Skills of the Officers**

Education and training of the officers mainly consists of two parts: one is the theoretical knowledge that the officer trainees should obtain in the classrooms and the other is fostering the officers' ability to turn the theoretical knowledge into practice. In the training curriculum of the officers, the training institutes conduct the theoretical training in the classrooms and the practical training is normally carried out in workshops, simulators and partially on board ships. During the course of the research and data collection, it was revealed that one of the major concerns of the ship owners was the officers' skills gap in practice. An operations manager (an ex-ship captain) stated that:

The STCW Convention requirement for deck cadets is to go for practical training on board ships for 12 months and the time for engine cadets is only 6 months<sup>36</sup>. It is so obvious that this on-the-job sea training is not enough... I remember, three decades ago the deck and engine cadets had to do their practical training on board ships in two phases: as a junior and then as a senior cadet. The sea time they needed to sit for the first competency exam was more than two years. In those days, the cadets even had designated training officers on board during their junior cadetship. Now we can see that the sea time has been reduced to less than a year. You cannot expect a cadet to properly practice what he is required to do as an officer during such a short period of time. Even the practical training in colleges is not that efficient. It is mostly conducted either in old workshops with obsolete equipment or on very cheap simulators and computers. So, the outcome of the training is officers with, I can say 'fair' theoretical knowledge but 'poor' practical skills. (SC3)

According to a crewing manager:

Some of the cadets are not sponsored by any shipping company and do not have support to board the ships for their sea-phase training. So, they join ships as ratings and work on board to produce evidence for the Administration that they have done their practical training and get approval to sit for competency exam. But we know that the time they spend as a rating and working as a rating on board ship is very different from being a cadet and having access to the officers' support, engine room, bridge, equipment and machinery which they need to touch and practically work with them. But, unfortunately, they have no other option. They are prepared just to pass their exams but this does not mean that they have sufficient practical ability. That's why we can see a big gap in officers' practical ability. (SC4)

It can be perceived from the above statement that the policy of some, mainly small, shipping companies not to get involved with the cadet recruitment schemes has adversely affected the cadets. They do not have access to ships for the sea-phase training, which, as the research data suggests, undermines the training output. The repercussions of this policy affect the ship owners who have problems with the competency of such officers.

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<sup>36</sup> Duration of on-board training for engine cadets has been increased to 12 months in the STCW 2010

The issue of deficiency in practical ability of the seafarers is not limited to the deck or engine cadets who later become ship officers, but it extends to the officers who apply for their second or third CoCs and further apply for promotion from junior to senior officers. The research interview data suggests that the ship owners address the lack of practical ability of the officers when they apply for promotion and they attribute this issue to the multi-nationality of crew on board, the fast turnaround of ships, fatigue and lack of motivation.

One of the senior operations managers stated that:

Many things have been changed on board ships comparing it to thirty years ago. Crew were about thirty or sometimes even more and, mostly country-mates...I remember ships were waiting at anchor and in port for days and even weeks. The ships are also faster and the ships are barely idle or stay at anchor. So the officers don't have much time to interact with each other...We can even see and hear from our officers that the operational pressure makes them exhausted and they do not find themselves in social settings discussing and exchanging professional ideas. The seniors find themselves too busy and there is no time to train juniors and get them ready for their promotions...Although we have procedures for on-board training we know that practically it is not possible to expect on-board training to be efficiently carried out. This is a big problem because how and where else would the officers learn about their next rank and their new duties? Anyhow, they have to find some time to practice and get themselves familiar with their new ranks otherwise the promotion board will fail them and send them back on board. (SC3)

From the ship owners' interviews it can be seen that the gap in practical ability of the officers is one of their main concerns.

### **5.3.3. Team-working**

The importance of 'team-work' and its influence on business is widely recognised in the contemporary literature (Tarricone and Luca 2002). In order to optimise any activity that needs to be performed by two or more individuals it is necessary to establish an efficient team-working environment. A setting is considered as an effective team-working environment if it facilitates proper communication among individuals (Kets de Vries et al. 2006). Ship operations would not be feasible without the collective determination of skilled individuals

working as a group in harmony. This is why having the ability and spirit of team-working is so significant in shipboard activities (Sadjadi Parsa 2008).

During the course of interviews, many ship owners and ship managers highlighted team-working as an important skill which the officers needed to have in order to successfully perform their assigned duties. This issue has been addressed by the STCW Convention and the MET system is required to accommodate appropriate training on this topic for the officers in their curricula (IMO 2011). However, the interview data shows that this issue remains a significant concern for the ship owners and also a challenge for the maritime training colleges. In addressing this issue, the operations manager of a shipping company stated:

Knowing theories is only one of the aspects, which is, of course, important. But another aspect which is also crucial in making the technical knowledge valuable, is the ability of the officers to do their job and know how to work in a team. This is a really important factor and unfortunately one of the areas which we find a considerable number of officers incompetent...This [team-working skill] cannot be taught in the classrooms in a short course...It needs considerable time to learn how to participate in team-work and how to manage complex work and be a leader in a team. Officers need to be knowledgeable and skilful, to be able to communicate and to efficiently share their knowledge and skills in team-work...Officers can be taught technical knowledge in classrooms, workshops and simulators, or taught to develop their English language skills in lab and classroom, but I think, when it comes to the subjects such as team-working, not much can be done in classrooms. This is the area that the people need to really practice and experience...The experience will be gained on board ships and in real practice when people work together. (SC9)

Efficient team-working is associated with having proper communication skills. Not surprisingly, the ship owners expressed concern about the communication skills of the seafarers on board their ships and this is the issue that is discussed in the next section.

#### **5.3.4 Communication Skills**

Communication is a key factor in a team-work setting and proper communication can enhance the team-working performance (Horck 2006; Kets de Vries et al. 2006). Communication skills become even more crucial for effective and safe team-working when it comes to performing



roles in multinational work environments such as working on board ships (Pyne and Koester 2005).

Interview data shows that the ship owners view the lack of proper communication skills among officers as one of the main concerns that undermine efficient shipboard operations. From their point of view, communication skills have two aspects; one is having a common working language and the other is being technically able to communicate with fellow workers in a technical setting. A fleet manager stated that:

...Communication is one of the areas which we find really problematic. We have officers from almost eight different nationalities working on board our ships. They are supposed to have sufficient English language knowledge but unfortunately, we find them not competent in this issue. The STCW Convention has addressed this issue and we cannot say that this is something which has been overlooked but apparently the outcome of what has been prescribed is not so effective in having certified officers with good English language knowledge. I think this can be attributed to the STCW provisions, inadequacy of the training centres' language courses, lack of enthusiasm and interest of the trainees themselves or a combination of all of those factors. It needs to be properly investigated by the experts. However, with the officers from some nationalities such as India and the Philippines, and some African countries we have less problems but with most of the other nationalities this is a serious issue. When we go on board ship for ship visits and inspections we find them having difficulty in communicating with us in a normal situation. Imagine how these people can communicate under intense work pressure or in an emergency?...The implication of the communication is not limited only to what I said. The officers need not only to communicate among themselves but they should be able to properly communicate with other ships, port authorities, pilots, workshops, loading and discharging cargo gangs, cargo owners, consignees, agents, officials who regularly interact with them. Problems in proper communications with those people jeopardise not only the ship but also the company's interests. (SC8)

A technical manager pointed out an important issue that indirectly relates to competency in English language, as the common language on board the majority of merchant ships. He stated that:

Having a common working language is not only for verbal communication on board ships but it has further implications. We have all of our ships' machinery and

equipment manuals and plans in the English language. So, if the officers are not conversant with the language then they will have problems in using the instructions and manuals which are important material for them. (SC12)

The STCW Convention has provisions for education and training of a common language and in Regulation I/14, holds the companies responsible for ensuring that the ship's crew can efficiently communicate their activities in an emergency (IMO 2011). Moreover, the SOLAS Convention also underlines the need for a common working language on board ships for safety purposes. However, after many decades of implementation and enforcement of both STCW and SOLAS Conventions, communication skills have remained one of the main concerns of not only the ship owners but also the ship officers themselves.

### **5.3.5 Commercial Activities Knowledge/Business Awareness**

Shipping activity is all about launching a business setup for transport of goods by sea with the ultimate goal of making a profit. Upon conducting the interviews with the ship owners, they unanimously voiced their concern about the commercial aspect of their activity, especially in the existing competitive shipping market. They perceived a gap in the skills and knowledge of the officers relating to the commercial activities on board ships. They expected the officers to be fully conversant with their role in optimising the commercial activities of the vessels and to be competent in safeguarding the ship owners' interests. It was the belief of most ship owners that the provisions of the STCW Convention mainly covered the safety aspects of seafaring and did not prescribe adequate training for the officers to have appropriate knowledge and understanding about the commercial activities of the ship. During the course of the interviews, in response to the question of what did the ship owners perceive about the nature of the officers' skill gaps, the commercial manager of one of the shipping companies stated that:

...As far as I have understood from the STCW Convention, it is mainly concerned about safety-related training for the seafarers. Within some subjects such as 'business and law' and 'cargo handling and operations' there are some commercial-related issues but I believe that the course contents are not sufficient to make an officer competent in handling all aspects of the commercial activities which a ship is involved with. This is one of the main concerns about officers training courses...We need the ship to run safely but if the officers are not skilful in, for example, optimising ships' spaces for cargo lifting, negotiating with the cargo owners and cargo receivers, handling draft

surveyors, knowing how to [supervise] properly load, secure and carry the cargo during sea passage, etc., end of the day, this is the ship owner which ends up with, for example, a damaged cargo on board ship and needs to compensate the cargo owner for that. (SC14)

A managing director of a shipping company elaborated on his concerns about the ship officers' lack of competency in optimising the use of the vessel's space in carrying cargo and how that had consequently caused a reduction in the company's revenue:

We had several cases where the vessel completed loading operations and after sailing we were informed about our commercial department's concerns that the vessel has not been able to load enough cargo therefore they had to pay for, what they call it as 'cargo short lifting' to the charterer. Then on investigation they found out that the vessel unnecessarily had too much fuel in the fuel tanks therefore the deadweight [the amount of cargo that can be loaded by ship, in tons] of the vessel did not permit the cargo to be loaded according to the contract...Some people may even think about it as common sense but we expect training provisions to cover the officers' commercial activities knowledge. (SC5)

From the interview data, it was evident that the ship owners perceived the officers did not obtain adequate and sufficient knowledge about the commercial activities of the ships in their training curricula and this area needed to be scrutinised by the authorities and be more effectively addressed in the STCW Convention and the MET system.

### **5.3.6 'Officer Like Qualities' (OLQ)**

Officer Like Qualities (OLQs) are defined as the qualities that a true and successful leader should have in order to lead the community or a group (SSB 2014). The term encompasses quite a number of factors a leader should have, including leadership quality, initiative, resourcefulness, self-confidence, decision-making ability, persuasiveness, integrity, loyalty and basic and practical intelligence. It is important to note that among the interviewees, some of the ship owners addressed the lack of 'officer like quality' in the new generation of officers and they attributed this issue to the lack of provisions in the current STCW Convention for this important issue. A training manager of one of the shipping companies stated that:

Nowadays we can rarely see that sort of ‘officer like quality’ which we used to observe on board ships three decades ago. I think there are many reasons for this but one of the very important ones is the way the current marine colleges are structured. They have not that kind of infrastructure and training setting which many of the marine colleges had a few decades ago, including large campuses, disciplinary regimes, group works and extra curriculums for leadership, appointing cadet captains and chief cadet captains for groups in the college, daily activities reporting system, court of honour in the college, etc.; those were the things which were fundamentally building up the issue of what we call ‘officer-like quality’ in trainees. We were building up officer cadets in a way to become future leaders on board ships. (SC13)

Although the new revisions of the STCW Convention have, to some extent, addressed shortcomings to some of the features of the OLQ of the seafarers’ training, e.g. teamwork and leadership, it is perceived that a vast area of this important aspect of the officers’ training is still overlooked.

## **5.4 Impediments to the Education and Training of the Officers, as Perceived by the Ship Owners**

It is well recognized in the existing teaching and learning literature that the development of skills is facilitated by education and training. However, the limitations to what can be expected from education and training to build up and enhance skills in various education settings should not be underestimated. One of the aims of this research is to shed light on the main stakeholders’ perceptions of the factors that hamper and cause limitations to what is expected from the training. In this section, the ship owners’ perception in this regard will be examined.

### **5.4.1 The STCW Convention as the Minimum Standard**

In answering the question about the reason why the STCW Convention is set as the ‘minimum’ requirements for the education and training of the seafarers, considerable explanations are provided by the IMO in justifying the rationale for adopting the current structure and content in composing the Convention. There are sections in the Convention which exceed the minimum requirements and the countries are recommended to consider them in their MET system, but these are not mandatory (see STCW Code, Part B). According to the statements made by the IMO officials during the interviews, by sticking to the minimum requirements, the IMO policy

is to create equilibrium for the countries in accessing and adopting the Convention. Considering the global nature of the Convention and implications it might have for the labour market if it cannot be implemented by the majority of the labour supply countries, in the contemporary circumstances where the majority of member states have limited resources by which to properly implement the Convention, it is perceived by the IMO that the STCW is adequate in prescribing the minimum requirements of training. It will remain at the discretion of the member states' maritime administrations and the shipping companies to enhance the requirements and the training, according to their needs.

There are many reasons, including high expenses of the seafarers' training courses, why the majority of member states adopt only the minimum requirements to comply with the Convention and do not enforce the extra curricula and the recommended training. Consequently, the training providers stick to the minimum requirements, as the generic training a seafarer needs to undertake in order to be eligible for the competency certificate. This is why and how the minimum standards implementation is dominant throughout the current MET system. However, the question also remains whether implementation of the STCW Convention, as the minimum requirements, provides the officers with the necessary skills to efficiently perform their assigned shipboard duties.

As mentioned in section 5.3.1, where the nature of the skills gap was discussed, one of the fleet directors (SC7) expressed his concern about inadequacy of the STCW Convention since it prescribes only the minimum requirement for the education and training of the seafarers. A training manager also stated that:

The STCW Convention is the minimum requirement for the training of officers. This is what most of the concerned parties stick to, each of them for their own reason. Administrations facilitate circumstances for reduction in training time that means less expensive training courses; investing less on training may result in relatively cheap labour; cheap labour is an incentive for ship owners to register their flag with the Administration. For the ship owners, duration of the training is important since they want the officers spending minimum time on the training and board their ships. For training institutes and training providers, it is important to attract customers. Customers are ship owners and officers. They both want to spend minimum time and money on training since the maritime training courses are generally very expensive. You can notice all of these factors are entangled and all of the concerned stakeholders somehow enjoy the current situation of sticking only to the minimum requirements. It

is beneficial to all parties to go for minimum training requirements. However, end of the day, the output of the training is producing incompetent officers with lots of skills and knowledge problems and skills gaps, boarding ships. All of these are happening based on the minimum training setting. This is the limitation the STCW Convention requirements bring about through the current MET system. So, I think in this situation we cannot expect the current training system to miraculously produce high quality officers. (SC13)

It is perceived from the above statement that most ship owners are aware of the shortcomings in the quality of the officers' training as the result of providing them with only the minimum training required. While the larger companies comprehend the shortcomings of the STCW minimum requirements and adopt enhanced training programmes for their officers, the smaller companies are less likely to do so. A managing director stated that:

We know that the STCW Convention is the minimum requirement for seafarers training. So, if we want to have quality officers on board our ships we cannot expect to provide them with minimum training and expect them to be very competent. Though, it does not mean that we go for maximum training also. We consider our needs according to our ship types and ask the training institute to provide the trainees with those extra trainings. However, we also ask the training institute to enhance efficiency of their training by deploying better training aids and instructors so the duration of the training is not elongated too much. (SC5)

Interview data suggests that shipping companies, regardless of their size, resources and involvement in education and training of their workforce, were aware of the limitations imposed by the STCW Convention as the 'minimum' training provisions but their attitude towards tackling the problem was completely different. The smaller companies attributed their attitude towards this issue to limited resources, the competitive commercial market and marginal profit making.

#### **5.4.2 Quality of Intakes**

As discussed in earlier chapters, the global shortage of seafaring workforce has been an ongoing concern of the industry and almost all of the stakeholders have recognised and addressed this important issue during the past few decades. The latest BIMCO and ICS manpower report (2015), as the most comprehensive assessment of the global supply and

demand for merchant seafarers, suggests that while the supply and demand for ratings are almost balanced, the shipping industry is still facing a shortage of officers. Despite all efforts being made to address the issue of a global skills shortage, many maritime nations are still facing a shortage of qualified officers to man their merchant fleets.

Research indicates that the global shortage of qualified seafarers can be attributed to two main factors: the rapid increase of the world merchant fleet and the difficulty of attracting and retaining people in the industry. In accordance with the results of studies conducted in this area, the ship owners perceived that seafaring, once a career of choice for many young workers, has declined in many aspects and not many people are attracted to choose seafaring as their lifelong career (Cockroft 2003). The decline in the number of job applicants undeniably decreases the choice of suitable people to recruit for a seafaring career. The ship owners considered this to be the root cause of the decline in the quality of intakes. Once the quality of the intake, as one of the most important elements in the education context, has dwindled, it is not unrealistic to infer that the effectiveness of the education and training will decline. Hence, the quality of the outcomes of an education and training curriculum may be greatly affected by the quality and aptitude of the student.

In supporting this perception, a training manager of one of the large shipping companies stated that:

In the past few decades we have been facing problems in attracting young people to come and join us. Previously when we intended to recruit 50 cadets, we could find a couple of thousand applications on our table and good choice of selecting high quality, intelligent and talented youngsters...Selecting the right people for this job was not only helping us by having minimum hassle and dropouts, but also the training institutes were happy in training them with a high rate of success...nowadays, it is very difficult to convince young people to join the merchant navy and go to work at sea...failure rate in examinations has increased compared to two decades ago. I can see that the training institute which trains our officers has better facilities now compared to facilities they had a few years ago. So it is not only to blame the training system or the training content being provided to the cadets. Rather I perceive one of the main problems being the quality of our intakes that is declining...this is where we may conceive that quality of intake directly affects the outcome of the training and when the quality of trainee is not high enough to absorb the training material it cannot be expected from the training system to produce quality officers. (SC13)

Although there has been a problem with the number and quality of intakes during the past two decades, the industry's 'grey literature' suggests that there are positive signs of a gradual increase in the number of applicants for seafaring jobs.

### **5.4.3 Personal Motivation**

According to Clark et al. (1993, p. 293), "Without motivation to learn, the most sophisticated training program cannot be effective." Motivation is something that strengthens, directs, and sustains learners' behaviour. It gets students active, points them in a particular direction, and keeps them persistent in achieving their goals. According to Fisher (2014, p. 4) "Motivation is a complex construct; it can be impacted by the person, the actual training, and the workplace" (see Salas et al. 2012). In general, motivation increases the time students spend on a task which is an important factor affecting their learning and achievement. As a fleet director stated:

Motivated students are always determined and show their determination in the training activities. We can see how enthusiastic they are to truly understand all classroom material. However, unfortunately nowadays the number of such motivated students has declined compared to what we had a few years ago. (SC7)

It was evident from the research data that the issue of motivation of the trainees, and its implications for the effectiveness of the education and training, goes hand-in-hand with the quality of the intakes to the merchant marine officer courses. The term 'quality of intakes' implies having choice over selecting the right people to enter the seafaring profession. According to the interview data, the people who enthusiastically choose this profession as their lifetime career are well motivated to be proactive in response to the training being provided to them. Ship owners claimed they had experienced a decline in effectiveness of the education and training whenever, for any reason, motivation of the officer cadets or officers decreased.

### **5.4.4 Diversity of Ship Types and Equipment**

As discussed earlier in this chapter, the STCW Convention is structured to provide generic provisions for the education and training of the seafarers. Although the Convention has specific requirements for the education and training of officers working on board merchant ships trading in coastal waters, vessels certified to make unlimited ocean-going voyages, ships with different sizes and propulsion capacities and specialised types of ships, for example, passenger ships,



tankers, chemical carriers and gas tankers, the training provisions for each category remain as the minimum requirements for that category of the ship. Thereafter, it remains the responsibility and choice of the administrations and the ship owners to prescribe additional training for the seafarers working under their flag and on board their fleet. Moreover, the diversity of the ship types and the machinery and equipment mounted on board, make it infeasible for the Convention to address all training requirements needed for these diverse categories of ships and equipment. It should also be noted that there are other issues affecting the training requirements of the officers, such as manning scale of the ships (the minimum number of seagoing personnel required by the administrations to be on board a specific ship) which has not yet been internationally regulated. Hence, the administrations may require a higher level of competence for the seafarers, should they mandate reduced manning scales. All of these factors affect the minimum training requirements of the seafarers and need to be addressed individually. This is what the ship owners were aware of and they considered it as a limitation to what could be expected from an internationally agreed generic Convention. One of the technical managers of a shipping company stated that:

Our company have ordered a few new ships and they are under construction. The machinery and equipment being installed on them are state-of-the-art. Even many of our superintendents are not familiar with the new machinery and controls being installed on board these new ships. So, how can we expect our officers to know about them? I am sure that the marine colleges also have not expertise to train officers for much of this equipment. So, it cannot be expected from STCW training courses to cover each and every training requirement. We need to address such training needs by designing specific training courses for our personnel. These are limitations to the STCW based training. (SC13)

Another ship manager stated that:

We have a few heavy lift carriers. These vessels have very sophisticated heavy lift cranes. Marine colleges cannot train our officer cadets and officers for these machineries. So, we have on-board training programme for our officers to learn how to operate them. (SC3)

It can be perceived from the statements made by the ship owners that diversity of ship types, machinery and equipment limit what can be expected from generic training to get the officers fit for all purposes. Interview data suggests that while the prudent ship owners understand these

limitations and take extra measures to bridge the skills gaps of their officers, the others put all of their expectations on the STCW Convention generic training.

#### **5.4.5 Limitations of Marine College Resources**

One of the key elements in the education context is considered to be the training providers' resources, which include infrastructure, facilities, training aids and instructors. When the seafaring workforce was principally supplied by the TMNs, they had their own active and well-established maritime training centres with relatively high standards and resources. However, there was a shift from TMNs to developing countries as a result of the globalisation phenomena (described in Chapter Two). These newly emerged labour supplying countries were mainly under-resourced. IMO audits discovered that more than three decades from the labour supply shift, it remains the case that not many of the newly emerged labour suppliers have adequate resources to maintain the training standards (see the European Maritime Safety Agency reports 2012, 2014; UFS 2014).

Interview data showed that the limited resources of the maritime training centres were perceived to be a major concern of the ship owners. They held the view that while the maritime training centres were ill-prepared and under-resourced, not much could be expected from the output of their education and training systems. One of the training managers stated that:

We occasionally visit the training centre that mainly our officers are being trained there. Unfortunately their facilities are very limited. The location of the college, the classrooms settings, workshops, simulators and libraries are not adequate. How can we expect from such a college and such a training setup to produce reasonably competent officers? Sometimes we donate some facilities such as workshop tools and books to them but we cannot solve all of their problems...It seems that the Administration also does not have sufficient resources to visit and audit the training centres. I believe that even if the Administration finds out about their problems and observes their shortcomings during their audits, they cannot impose too much pressure on them because the majority of them are under-resourced. If the Administration wants to impose the regulations on them, as it should principally do, then they should cease most of the training centres' activities and this might have lots of further consequences...the Administration mostly ignores the shortcomings and compromises on the issues. They are not very strict. The effect of this compromise will further be

imposed on us by having certificated but incompetent officers on board our ships.  
(SC10)

An operations manager in answering the question about limitations of what can be expected from training, stated that:

When the maritime centres are substandard and they do not have sufficient resources you cannot expect to have high standards of training. While the duration of the officers' education and training, both in classrooms and on board, is officially reduced by the Convention, I think what can, to some extent, compensate those reductions could be resources of well-prepared marine colleges with enhanced training facilities. While the college does not have good instructors, when the number of instructors are not enough, when the workshops and simulators are not standard and the college uses the cheapest of all those mentioned, then the education and training system cannot run properly. This is what I understand from limitation to the education and training...Even the best possible training curriculums may fail if the training providers' resources are not sufficient to run and support the training programme. (SC3)

Another aspect of the limitations to the training institutes' resources comes from comparing teaching and learning in the real workplace to what can be expected from training in classrooms, workshops and simulator cubicles. This is what the ship owners perceive as one of the major limitations to what can be expected of being taught utilising the training college resources. One of the operations managers elaborated on this issue as follows:

Most of the training institutes do not have proper teaching and learning facilities. Only some of the well-established colleges provide good simulators, proper workshops and standard facilities to trainees. Those colleges are mainly supported by big shipping companies. They train cadets for those companies and the companies financially support them to prepare and provide good training aids to their cadets...Good simulators and good workshops help but until the cadet and the officer go on board ship and practice it with real machinery and equipment you cannot say that they are competent doing it. This is one of the limitations to the education and training. So, as we can see there are two issues here; firstly, the training centres have limitation in their resources and secondly, even in case if they can provide reasonable training facilities to cadets, still the outcome of the training with simulators and workshops is limited and cannot fully replace the real shipboard practice. (SC9)

As it can be seen from the above two accounts, the ship owners were concerned about the training providers' resources and they perceived limitations to what could be expected from the education and training per se. They supported the idea that a successful training curriculum needs to be reinforced by the appropriate resources and facilities. Considering the reduction in duration of the training ashore and on board, it was felt that maritime education colleges should optimise the time being spent on education by enhancing their resources and conditions.

## **5.5 Summary**

It was largely perceived by the ship owners that a considerable population of the trained seafarers who boarded their ships were not competent and were ill prepared to perform their assigned duties. The interview data suggests that the nature of the existing gap, from the employers' point of view, ranges from operational and technical issues to the social aspects of the skills needed by officers in order to fulfil their professional duties. Technical knowledge, practical ability, team-working skills, communication skills and commercial skills emerged as the areas where the employers perceived there to be major shortcomings under the provisions of the STCW Convention.

The research data suggests that the most prominent means by which the ship owners and ship operators build up their perceptions about the quality of the officers and their skills gap are: accident and incident reports (and investigation and analysis of such reports by the technical departments of the shipping companies), analysis of the companies' revenue and expenses, ship superintendents' inspection reports, commercial department performance reports, safety and quality officers' audit reports, periodical personnel appraisal systems on board ships, Port State Control (PSC) inspection reports and detention rates, training needs applications received from ships for upgrading the officers, and the results of job applications and officers promotion through the interview boards.

Moreover, the employers' perceptions about the reasons for such shortcomings are diverse and range from limitations to the STCW Convention as the 'minimum' requirements for officers' training, the quality of the officer cadet intakes, personal motivations, diversity of the ship types and equipment, limitations in the maritime colleges and maritime administrations' resources in implementation of the regulations.

While care should be taken in drawing conclusions from a relatively small data source, the interview data suggests that, in respect of the overall study, there is a distinction between some of the larger shipping companies' perception about the research questions when compared with some of the relatively smaller shipping companies. Moreover, the ship owners are aware of the fact that highly skilled officers who are trained and employed by the reputable shipping companies largely remain loyal to the company and this issue lessens the human resource quality and skills gap issue to a great extent. However, the research data suggests that it is primarily due to financial constraints that smaller shipping companies are not benchmarking the successful shipping companies' human resources policies in order to overcome their skill gaps and wider quality issues.

In the next chapter, the research data relating to the merchant ship officers' perceptions about the STCW Convention provisions, the contemporary MET system, and the overall competency and skills gap of the ship officers will be examined.

# CHAPTER SIX

## Research Findings: Officers' Accounts

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### 6.1 Introduction

The contemporary maritime industry needs well-educated and trained officers to operate high technology ships with reduced crew sizes. The introduction of a new machinery and equipment on board ships, the transformation of workplace tasks and social settings along with the restructured operating strategies of the shipping companies inevitably demands appropriate training for the new generation joining the labour force and the knowledge and skills of the existing officers to be upgraded. Therefore, it is necessary to find out whether the officers are satisfied with their current education and training or perceive a gap in their skills and competency.

This chapter will present the results obtained from the qualitative interviews with the merchant ship officers. The prominent issues and concerns raised by them with regard to the research questions and the aims of the study will be discussed. For this purpose, the following research questions were set to be answered through the interviews:

- 1. What informs the interviewees' perceptions, concerning the ship officers' skills and competency gap?*
- 2. What is the nature of the perceived skills gap, as understood by the officers?*
- 3. What are the impediments to the education and training of the officers, as perceived by the informants?*
- 4. Are the perceived gaps between the training being provided to the officers and the actual skills they need to perform their assigned duties being adequately addressed?*

Interviews with officers helped me to explore their ideas about the quality of training offered to them through the MET system. Their feedback included their perceptions of their own skills

and competency as well as their observations on that of their fellow seafarers. The officers' responses to the first three questions are discussed in this chapter and their answers to the question about measures taken to address the perceived gaps are incorporated in the Discussion and Analysis chapter.

## **6.2 What Informs the Officers' Perception About the Skills Gap?**

During the course of interviews with the officers, they all said they perceived a skills and competency gap among a considerable population of the merchant ship officers and based their observations on a range of different sources. Their views were typically founded upon reflections on what they had experienced during their own training, their observations of the performance of their co-workers on board ships, accident and incident reports, inspection and audit reports, information disseminated in professional publications and also through anecdotal information they exchanged with their fellow seafarers.

### **6.2.1 Own Experience**

In answering the research questions raised in the interviews with officers, some interviewees reflected on their own training and the way they had experienced a gap in their skills and competency. The nature of these responses differed from those provided throughout this research by the other stakeholders as they were not providing their perceptions about others but giving first-hand accounts of their own experiences. As one of the officers stated:

I never forget the first time I step into the bridge as a third officer; I was not confident whether I can make it...there were many instruments which I didn't know...in college they hardly even taught us the basics...I didn't have good opportunity during my cadetship to work with the bridge equipment...we [the interviewee and his fellow cadet at the time] were mostly used as deckhands and doing deck work and maintenance along with crew...officers were busy with their own work and it looked like they were not keen to spend time with us. Of course, later when I became senior officer I realised that it has not been only the matter of not willing to train us but maybe they were tired and preoccupied with their own duties and did not have time to take care of us...now for the new cadets and officers the situation is even worse than what I experienced...for me, it was not only the matter of not being confident to start my officer job, rather I

was not competent. I had problem in working with the bridge equipment because I had very little opportunity to work with them before I became officer. I think in order to be confident in doing something first you need to be competent, I see these two together. (SF22)<sup>37</sup>

The interview data suggest that some of the officers had experienced, one way or other, a gap in their own skills and competency. This mostly applied to those who had been in the job for a relatively short time. They attributed the gap to the quality of both college and on-board training. Another officer elaborated on the research question and stated that:

...Education and training was not good in my college, we had many problems...when I went for on-board training I experienced another type of problem...I was always worried about officers asking me a question which I could not answer and they judge me...when I completed one year sea training I was not sure what will happen if I pass the CoC exam and next time come on board as an officer...and this came true, I passed the exam but, frankly, I was not ready to be an officer, I was not competent, the training system could not suitably help me to develop my skills and step into my career... This issue was not only for my cadetship but it went on even when I was going to be promoted from 3<sup>rd</sup> officer to 2<sup>nd</sup> officer and from 2<sup>nd</sup> officer to chief officer rank...at the beginning of all ranks I had the same feeling because there was problem in the training system which resulted in me realising that there are areas which I needed knowledge and skills for my job but I didn't have. (SF24)

From officer accounts it is evident that they were aware of the gaps in their own skills and competency and, from their own experiences, were able to recognise similar deficiencies in their fellow officers. Officers' answers included issues with their personal education and training experiences in the maritime colleges as well as the training they received on board ship. The shortcomings applied to the training they had received during their cadetship, through to their first CoC qualifications, during further training for their second CoCs and for higher ranks as well as on-the-job mentoring.

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<sup>37</sup> SF: Seafarer – this code identifies the officers' accounts – see Appendix 2b



## 6.2.2 Observation of Fellow Officers

In addition to officers' experiences of their own education and training, the research data revealed that perceptions of the officers' skills and competency gap was also built up through observing fellow seafarers working on board ship. One of the captains stated that:

...I can see knowledge and skills gap of the officers who I have been working with...I have had many officers that they did not know even the basics...I ask from my junior officer about, for example, bay plan<sup>38</sup> and he doesn't know what is a bay plan. This is his first time on container ship...This is not the time for learning 'basics'...when I ask for a crew change, I am not sure who will replace the leaving officer, maybe I'll get somebody even worse. I can see from performance of the officers, mainly the new generation [officers] and from some countries...their quality is not good. (SF2)

Almost all of the interviewees considered observation of the performance of the officers on board ship to be one of the main sources that informed their perception about the skills and competency gap among the officers.

## 6.2.3 Accident, Incident and Casualty Reports

Accident and incident reports are circulated by some shipping companies<sup>39</sup> to their ships to inform their personnel about mishaps and provide them with 'lessons to be learnt'. Ship officers considered them very useful and informative, not only as a means of learning lessons from others' experiences, but also as one of the means by which they built up their perceptions of the extent of the skills and competency gap in the seafaring labour force. One of the interviewees stated that:

Usually accidents happen when somebody makes a mistake. It doesn't matter what is the root cause, either fatigue, lack of knowledge, lack of skill, whatever you name it, I call it lack of professionalism and lack of competence...all statistics show only the

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<sup>38</sup> Bay plan is the cross sectional view of the container ships covering both the deck and under-deck of the ship, indicating each container location on board ship.

<sup>39</sup> Not all companies have this mechanism of circulating the accident and incident reports on board ships.

accident reports, which is really high in the industry, but I think hundreds of ‘near misses’<sup>40</sup> takes place before one accident happens. So, look at the whole picture not only to the accident reports. All of those [accidents and near misses] showing mistakes but only one, which has ended to happen, is called an accident and highlighted. Nobody talks about near misses but we are well aware of it...all of these are showing that there are problems in the system...officers’ quality is declining. (SF1)

There is potential for this area to be explored as a means of bridging the perceived knowledge and competency gap. Information from the reports could be used in the MET system, either in college or on board ships, to educate the officers about dangerous practices and risk avoidance. This subject will be revisited further in the Discussion and Analysis chapter.

#### **6.2.4 Inspections and Audit Reports**

Many of the interviewees felt that inspections and audits were difficult situations to encounter, but recognised that they contained invaluable information that could be used to identify problems. These reports include superintendent visits, internal and external audits, vetting<sup>41</sup> and PSC (see 5.2.8) inspections. Interview data suggests that officers considered these inspection reports to be a good means, not only of detecting the ship’s deficiencies, but also of identifying the knowledge and skills gap of the officers on board their ships. A chief engineer stated that:

...It is always difficult to handle inspections by outsiders. But, the findings are important. They look at the things from a different angle. Sometimes the reports show us the realities and problems which we could not identify them...let alone the nature of the non-compliance the inspectors raise and the role of the companies in those problems, if you look at them carefully it is not that difficult to realise that some of the problems indicate the skills and competency gaps in the officer...for example, when I see that a superintendent or PSC officer raise a problem with generators, and I know

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<sup>40</sup> Near miss is defined as a narrowly avoided collision or other accident.

<sup>41</sup> Vetting is an inspection (usually comprehensive) to verify whether the ship (mostly tankers) complies with the international legislation and the industry’s specific requirements. The inspection reports are mostly used by the charterers, enabling them to compare between similar ships and choose the best for their needs, to maximize efficiency.

that we have sufficient tools and spare parts on board, I know one of the reasons for that problem is that the 3<sup>rd</sup> engineer doesn't know his job to take care of it. (SF14)

At face value, most of the content of these reports is technical in nature. However, the interviewees considered them as a good indication of the performance of the officers and a means of identifying gaps in their competence.

### **6.2.5 Periodical Personnel Appraisal**

Most of the shipping companies require the master and chief engineer of the ships to periodically evaluate the performance of their subordinates. Interviews with the senior officers indicated that periodical appraisals were one of the means by which they built up their perception about the knowledge, skills and competency gap of the officers. One of the captains stated:

One of the first things I do when I board a ship is to go through the periodical appraisal forms of the crew from the previous voyage [filled out by the previous captain] and know about their performance. This gives me a fair idea about individual performance...Mostly the appraisal forms show that officers have skills gap in certain areas...later when I appraise the officers, I do also put together their skills gap and report it to the company. (SF5)

Although interviewees considered the personal appraisal forms to be a valuable means of learning about the skills and competency gap of the officers, a few interviewees pointed out a flaw in this mechanism that may undermine the validity of the forms. According to their statements, the periodical appraisal forms are used as the basis for companies to allocate performance-based bonuses and/or promote the officers to higher ranks. They alleged that sometimes senior officers were sympathetic to individuals and gave them a better mark than they actually deserved. This was so the appraisal would not be detrimental to their income or promotion prospects. To the interviewees this meant that the skills and competency gap was sometimes even worse than could be perceived from the appraisal forms.

## 6.2.6 Training Needs Applications

In compliance with the ISM code (Regulation 6.5), shipping companies should establish and maintain procedures for identifying any training that may be required in support of their safety management system (IMO 1993). Therefore, shipmasters are instructed to identify the crew members' training needs and inform the company. Training needs are identified by the master and chief engineer of the ship, based on an individual's performance. They reflect the perceived knowledge and skills gap of the officers. Moreover, the individual officers may also state their own training needs that will be added to those identified by the master and chief engineer.

Interview data suggest that the training needs applications can be a useful means of disclosing the skills and competency gap of the officers. However, whether the needs identified on the applications are a genuine representation of the gaps depends, to some extent, on the individual companies' training policies and their commitment towards addressing the training needs of their officers. As one of the masters stated:

If I see any problem with officers' performance, it means that there is a gap and I reflect it in the training needs application form to the company. Before sending the application to the company, I ask the officers to look at the application and let me know if they want to add any other training need to the form...It depends on the company to take action in dealing with the identified gaps. Some companies arrange extra training for officers but this is not always the case. Some companies do not support training identified in the application, rather they ask the officer to find and attend a suitable course and provide evidence to the company. That is why attitudes towards the training needs applications are different. If the company supports training and pays for that, then officers are happy to apply for extra training. But, if they [officers] are going to attend the extra training spending from their own time and money, then they have a problem and they don't like it...however, these applications are very useful tools for me to realise the problems with the competency of the officers. (SF9)

Interview data suggests that the senior officers consider these training needs applications as a means of forming their perception about the officers' knowledge and skills gap.

## 6.2.7 Industry Periodicals

Information disseminated in the professional publications is widely considered as an invaluable medium through which to inform the stakeholders about the industry's events, new technologies and innovations. Interviewees of this research considered these publications to be useful not only as a means of finding out about changes and new technologies but also about new regulations, the industry's skills shortage and skills gaps. One of the chief engineers stated that:

Industry periodicals certainly contain very useful information and keep us updated with the latest news. They contain new requirements and new technologies and give us an idea about what is happening in the industry. They even reflect issues related to the problems in education and training of seafarers, competency of officers and shortage of the workforce...but the problem is getting access to them. (SF3)

Another chief engineer stated that:

Sometimes our superintendents, when they come for ship visits, bring us a few copies [of industry periodicals]...they contain not only technical information but give us an idea of what is going on in our industry...the problems and concerns of the shipping companies and administrations are sometimes reflected in the magazines and this is how we know that the problem with quality of officers is not only in our shipping company but is the industry's concern. (SF15)

The officers considered the industry periodicals to be an invaluable means of informing their perceptions about the skills shortage and the skills gap across the industry. However, the data suggests that not all of the shipping companies regularly supplied this information on board their ships.

## 6.2.8 Anecdotal Information

In addition to what the officers personally experienced and observed, the interview data suggested that their perceptions about skills and competency gaps were partially built up through exchanging experiences with their colleagues from other ships and the industry. One of the captains stated that:

I hear from my friends in other ships that they also have problem with their crew...they complain that they feel some of their officers are not competent and this makes them worried...It is a widespread issue within the industry...these days, when we talk and exchange views about our sea-life, it is typically about the quality of the officers...one of my friends [a ship captain] said that he was worried about performance of his junior officers. That's why he could not go to bed and always kept an eye on the bridge and at sea from the porthole<sup>42</sup> (SF20)

Interview data suggest that sharing experiences with peers helped the interviewees realise the extent of problems such as lack of crew competence.

Having looked at the various sources that inform officers' perceptions of the skills and competency gap, the next section aims to elaborate on the 'nature' of the skills gap as perceived by the informants.

## **6.3 What is the Nature of the Perceived Gap, as Understood by Officers?**

Based on what has been discussed so far, it was evident that there were considerable concerns about the performance of the merchant ship officers. Interviewees drew upon a range of sources in order to build up their perceptions of this issue. This section looks at the officers' perceptions of the nature of the gaps and, where appropriate, their causes and effects. Research findings revealed that gaps existed in the areas of technical knowledge, practical skills, communication and team-working and a range of social and behavioural skills.

### **6.3.1 Technical Knowledge**

What the officers meant by technical knowledge was the theoretical aspect of education. It reflects theoretical knowledge since this knowledge directly informs the technical skills of the officers. The MET system provides the officers with theories but officers attribute the

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<sup>42</sup> A porthole is a small (mainly round) window in the side of a ship's living quarters.

shortcomings in this area partially to the provisions of the STCW and more importantly to the training curricula of the maritime colleges.

Interviewees asserted that despite revisions made to the STCW Convention, there were still knowledge requirements that were not in use any more in modern ships and they considered them as 'old' and 'outdated'. Although the officers did not elaborate in detail on what they meant by 'outdated' knowledge, they provided some examples such as 'celestial navigation'<sup>43</sup> and 'sextant'<sup>44</sup>. These topics are still present in the latest revision of the STCW Convention. Considering the reduced education and training time of the officer cadets and officers compared with a few decades ago, officers were of the opinion that time should be more usefully spent on providing knowledge of the equipment and machinery of the new generation of ships. One of the officers stated:

Having theoretical and technical knowledge for our job is necessary but it is necessary to find out what type of knowledge do we need...it is better to remove the unnecessary subjects, such as celestial navigation, which by introduction of GPS is not being practiced any more, and use the time for knowledge which officers need for new tasks...knowledge about new communication systems, new propulsion systems, new controls, new hatch covers, new regulations and many other things. Experts should look at this area and find out what type of knowledge is necessary for officers in different ranks and departments on board the new generation of ships...the nature of tasks on board ships are changed and demand appropriate knowledge. (SF7)

The other area where perceived shortcomings were identified was in the curricula of some of the training institutes, which were regarded as outdated. The interviewees perceived that although the STCW specifies the knowledge requirements for officers, it is mainly in general terms and there was a possibility of different approaches by different training institutes. They thought that colleges designed their courses on the basis of their available resources while fulfilling the STCW requirements. For example, if they were being given theoretical training on the technicalities of a specific piece of machinery, that training would have been designed

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<sup>43</sup> Celestial navigation is the science of calculating and finding a ship's position at sea by using celestial bodies, such as the sun, moon, stars and planets.

<sup>44</sup> Sextant is an instrument for measuring angular distances used especially in navigation to observe altitudes of celestial bodies.

around the machinery in the college's own workshop, so the practical training would be carried out on that machinery. However, the facilities were old, so the information they were being given was not up-to-date and did not cover the knowledge they actually needed on board ships with new machinery and equipment. Although the principles might be largely the same, detailed knowledge about the machinery and equipment were important issues that were being compromised.

One of the officers stated that:

Officers need knowledge and theories applicable to the new machinery and equipment...I cannot say all of the colleges, but at least the colleges I have attended do not provide theoretical knowledge of the new equipment. Sometimes they are not even aware of the new equipment and machinery which are newly installed on board new ships...some of the theory classes are supplemented by practical training in workshops and the theories the college provided are based on the principle of those old machines available to them. (SF13)

Another chief engineer stated that:

It is not only the matter of learning generic principles and theories. The new equipment needs a lot more knowledge than the old machines. Fault diagnosis and troubleshooting needs an in-depth knowledge about the equipment. These are not being provided to the trainees in theories. (SF25)

Officers perceived that the new technology required more knowledge and in-depth theoretical training. Moreover, the diverse types of ships, equipment and machinery demanded wide-ranging knowledge and skills to be gained by officers. However, the issue of providing all necessary knowledge to trainees during a limited period in college remains a challenge. Some of the interviewees advocated the idea of a 'segmented labour market' where the workforce is educated and trained for a specific type, or class, of ship, with specific machinery. As one of the interviewees said:

In our company the ships are classed in a few categories and the company tries to send selected officers to different ships since they are familiar with the equipment and machineries of those ships. (SF4)



Moreover, the perceived knowledge gap was partly attributed to the shortfall in the knowledge of the trainers who had not been updated with new theoretical concepts, as well as to the diversity of the ships and equipment. This issue will be further discussed later in this chapter.

### **6.3.2 Practical Skills of the Officers**

Officers develop their skills in the process of carrying out their jobs where they turn the theoretical knowledge into practice. In the current MET system, part of the skills development of the trainees takes place in workshops and simulators within the college. This training is supplemented by the practical training in the actual workplace on board ship. Research data suggest that the interviewees had significant concerns about the practical skills of the workforce. They attributed the perceived shortcomings to the inadequate and insufficient opportunities the officer cadets and officers received, both in college and on board, which hampered the development of their skills and competency. One of the captains stated that:

...although at the first glance the seafaring job shows only its technical face to the outsiders, the reality is that an officer needs to have a diverse range of skills, from technical to managerial and social skills. Most of these skills can be acquired by practice...I can see that on board ships officers have a skills gap...working with bridge equipment and deck and engine machinery needs a range of practical skills...Examples of the skills gap I have noticed in deck officers is mostly in the areas of navigation, ship handling, ECDIS, efficient use of ARPA and communication, not only within the ship but in the interaction with other ships when necessary during navigation. (SF2)

In elaborating on the practical skills gap of the officers, one of the chief engineers provided some examples:

Some of the engineers have fairly good theoretical knowledge, not all of them, but the problem is mostly in their practical skills. Ship's engine room and deck machinery comprises many sophisticated and high-tech equipment, which demand skilful people to operate and maintain them...the practical skills problem of the officers exists mostly with the new generation of machineries, engine controls and hydraulic systems. (SF13)

The above-mentioned statements from a captain and a chief engineer are only samples of the interviewees' perceptions outlining broad areas of the officers' skills gap. However, more

detailed identification of the practical gaps would require comprehensive research to be carried out in this area. This issue is revisited in the Conclusion chapter.

The interviewees strongly believed that a drastic reduction in the duration of practical training and skills development requirements set by the STCW Convention and inefficiency of the MET system in providing practical training to the trainees were among the main reasons for the shortcomings. One of the officers stated that:

On top of the time I spent in college, I spent more than two years in total on board ship for my practical training. For one year we were in a group of ten cadets and we had a training officer [designated training officer] on board...in the second sea-phase, I went on board as a 'senior cadet' and spent about one year for practical training and most of the time I was supervised by ship officers. Now, the STCW Convention has reduced the requirements to only 12 months and there is no training officer to train them on board...training officers had a big role on board ships in taking care of cadets...now, everybody expects ship officers to take care of cadets' training but with reduced number of crew and fast port calls, how is it possible?...I strongly believe that not only the on-board training time is not sufficient but also eliminating the training officers has a very negative effect on the practical training of cadets. I don't believe in the current situation they [cadets] can even learn the basic skills...this is why when they come on board as an officer they are not competent. (SF4)

One of the captains stated that:

...I had to go on board ship for about, as an apprentice, two and a half years. My apprenticeship was divided into two phases on board - as a junior and then senior cadet - to do hundreds of tasks, each task for number of times, based on a comprehensive 'training record book' I took with me on board...then I was eligible to appear for the Class II<sup>45</sup> exams...that sort of apprenticeship training does not exist any more...Nowadays, a cadet comes on board for about one year only and before he even knows the gangway<sup>46</sup> and the accommodation [sarcastic statements] the sea time is over and he is signed off to go for 2<sup>nd</sup> mate exam. What quality do you expect this

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<sup>45</sup> Class II is the first Certificate of Competency as a deck officer on board merchant ships, also called Second Mate.

<sup>46</sup> Gangway is a special ladder attached to the ship as the means of access between ship and shore.

person to have when he comes back to ship after few months, just passing the exams and holding the certificate of competency...next time he is joining as an officer...we are talking about quality of new officers, this is what I get. Time is too short for them to learn something. (SF1)

The statements indicate that the officers' training pattern is changed and the traditional apprenticeship model is vanishing. The on-board training is being squeezed from two sides. On the one hand the reduction in duration of the practical training coupled with the removal of designated training officers on board ship has adversely affected the opportunity for trainees to develop their skills. On the other hand, the fast turnaround of the ships, reduced crew compliment and job intensification does not leave any extra time for the ship officers to provide necessary mentoring to the trainees. Additionally, the ship owners are not keen to provide appropriate and sufficient training berths to the new workforce to get the opportunity to board the ships as apprentices and develop their skills. One of the officers stated that:

If the cadets are sponsored, they come on board as a deck or engine cadet. But on many occasions cadets are self-sponsored therefore companies do not give them access on board as a cadet and they have to join as a rating just to fill their training record book and go for CoC exam...Previously most of the ships had designated space in the accommodation for cadets but I have been on board many new ships where there is no space for cadets, so where they can go to stay on board?.. Officers do not have time to spend on cadets, let alone those who join as a rating. They have to do ratings' job...With reduction in crew size and at the same time additional job responsibilities such as taking role of radio officers by deck officers, new tasks and paper works brought about by ISM Code and ISPS Code, not having catering officer on ships and the related job which is being done by officers, and many other workload does not leave any extra time for the officers to do a training officer's job as well...The training officer's job a few years ago was a full-time job. Especially when it comes to training the cadets it needs a lot of time and effort to train them if you want them really to learn something. When it comes to mentoring the junior officers, although it is still time-consuming, their problems may be solved by answering a question because they know the basics and background, although this is still a problem for several reasons including the workload...When they [trainees] finish their sea service they ask officers to sign their training record books but whether they have learned anything on board from those tasks in their record book, I doubt it...another problem is the time officers can devote to training others... (SF23)

The issue of practical training and need for mentoring does not only apply to the officer cadets but the officers themselves. They also need peer mentoring support on board ship in order to develop their practical skills for their next CoC and promotion to a higher rank. However, interview data suggest that there is a substantial gap in this area. As one of the officers stated:

It all depends on people you are sailing with whether they are friendly and eager to teach you something. If not, you cannot have objection because they feel not responsible in helping you. There is no clear instruction to make officers accountable to teach others...However, I have worked on board ships where we were all from the same country and I found the officers having sort of comradeship and more helpful and welcoming to train the country-mates...there is other issue which needs to be considered. We should know that a good officer is not necessarily a good mentor. Some people are excellent in their job but cannot teach others. We should not expect it from everybody...even now which I am going for promotion [interviewee is chief officer and due for promotion in a few months] I have never had opportunity to actually practice a ship-handling or play a captain's role. The things I have learned is some theoretical knowledge in college and ship simulator exercise and bits and pieces on board...handling actual ship is different from what you experience in simulator...I have never been feeling fully competent in new ranks and had to do a lot of trial and error and I was lucky that nothing went wrong in my trial and errors. (SF22)

It is worth mentioning that the officers who were on board ships with a crew composed of a national labour force and less mixed crew had fewer problems with the issue of communication (discussed later in this chapter) and peer mentoring.

A review of policy documents shows that on-board training for officers is not appropriately defined. The STCW Convention training requirements for second CoC and higher ranks comprise college-based theoretical and practical training. Additionally, the officers need to have evidence of serving for a certain period of time on board ship as an officer (with their first CoC). It means that there is no compulsory and methodical on-the-job training for officers (unlike cadets who have in-service training provisions specified in the Convention) to develop their skills for the higher ranks. This is a significant gap in the officers' training that is discussed in the Discussion and Analysis chapter.

Another important aspect of the practical training relates to the changing nature of the tasks and sophistication in the new equipment and machinery. Bakker et al. (2006) and Emad (2011)

point out that with the introduction of new technology, many aspects of the jobs have become less visible. It means that the work performance is mainly through the mind process of the practitioner rather than being physically visible. Examples include working with radar, computers and sophisticated machinery and controls. Therefore, the issue of training and skills development cannot efficiently take place by observation per se and demands the mentor to explain the procedures to the mentee while performing a task. This is one of the important issues that officers pointed out during the interview. One of the officers stated that:

When I am working with radar or ECDIS, it is not only that a trainee can observe and learn from me. It needs a lot of time and effort to explain what I am doing in detail, otherwise the trainee does not learn...I try to find time for cadets and officers to teach them on board but there are not many people who have time to do that. (SF18)

In addressing the reduction in duration of on-board training, the STCW Convention has adopted alternative means for bridging the gap by approving simulators and workshop training in partial fulfilment of the practical training of the trainees. While the officers recognised the benefits of the simulator and workshop training in colleges, it was a common perception that the output of this training was not as effective as the practical training on board ship and within the actual 'community of practice'. The problems in this area included duration of the practical training, quality of the simulators and workshop equipment as well as the competency of the college trainers. One of the officers stated that:

Most of the time is spent in the classroom with theories, and they [college] do not provide sufficient time for practical training...I had only few hours training in the bridge simulator that was not enough. (SF24)

Another captain expressed scepticism about the effectiveness of simulator training:

I had experience on board container ships when I was 3<sup>rd</sup> officer and 2<sup>nd</sup> officer. When I went for the chief mate course in the college they took us to a simulator and the instructor set a scenario on handling a container ship. On the simulator, the ship was behaving just like any other normal ship but I knew that an empty giant container ship, with the ship's hull like a big wall, in just a little windy weather is extremely difficult for handling and does not manoeuvre easily. This was not something which that simulator could provide to the trainee...there might be some good simulator which can

give you that impression but not all colleges have those sort of high quality simulators.  
(SF3)

One of the interviewees, in elaborating on his training experience in a college workshop, stated that:

The workshop in the college was under-resourced. The equipment were mostly old and some of them were even faulty...college should be equipped with the new machinery which we see on board ships...the workshop was not good and mostly a waste of time...instead of having the real equipment they had animations on the computer and using to train us about some of the instruments. I wonder how the Administration approves this sort of facilities for practical training...when I went on board ship I had to ask officers to help me to learn. (SF16)

One of the second engineers emotionally expressed his perceptions of the practical training in the college and said that:

Until you do not work in the noisy engine room, in 65 degrees centigrade temperature and do not feel the heat of the main engine on your face and hands, you cannot say that practically you can do the job...I don't mean to totally object to the simulator and to workshop trainings. There are of course some positive aspects to this training, especially electronic and hydraulic training, but for most of the other skills it is necessary to have the real workplace experience...some skills can be gained only when you work with a group of people and learn to be in harmony with a team. (SF27)

Many of the interviewees emphasised the role of the college trainers and instructors in the skills development of the trainees. One of the officers highlighted the issue of trainers' lack of experience that undermined the quality of practical training in colleges:

When I went to college for chief engineer ticket, 'electronic and control engineering' subject instructor did not know about the new electronic and control systems on board ships. He didn't have experience working on board new ships...last time he has been on board was in late 1980s. Many things are changed on board ships and the instructors should find some way to update themselves otherwise their training would not be effective. (SF18)

The problem with the skills gap of the officers did not merely lie with the practical training either in college or on-board. Fast promotion was another issue which some of the interviewees perceived to be a factor. This issue arose as a result of the skills shortage which prompted ship owners to accelerate the promotion of officers to higher ranks. This resulted in officers who had insufficient time to develop their skills. One of the captains stated that:

...There is a shortage of officers in some ranks. For example, senior engineers and chief officer ranks. Companies promote the junior officers to fill the shortage but they do not think that the officer should stay in a rank and gain experience...only having the higher rank certificate doesn't mean that the person is ready to get promotion for next rank... there are shortcomings in the training in college both in theory and practice, so the only available place remains to fill those training gaps could be on board ship through having enough time to experience and learn from others...fast promotion undermines safety of the ships. (SF2)

Additionally, the interview data show there to be several underlying reasons, including job intensification, fast turnaround of ships, multi-nationality of crew complement, communication snags and perceived social isolation that undermine the peer mentoring on board ships.

Interview data suggest that the practical aspect of training was one of the most prominent areas where officers perceived the gap to exist. While they identified deficiencies in both college-based and on-board practical training, the officers mostly regarded practical training in 'communities of practice' on board ship as the most effective setting in which to gain skills and competence. The issue of addressing problems in this area appears to be challenging and complex since the feasibility of providing efficient on-board training in the circumstances discussed above appears to need a series of collective actions by different stakeholders.

### **6.3.3. Teamwork, Communication, Leadership and Managerial Skills**

Due to their complex nature, most shipboard operations require a team of experts with multiple skills to perform the tasks involved. Hence, efficient and safe operations on board ship demand a good team-working environment where team members recognise the principles of teamwork. Teamwork is a skill that needs training and experience. Good communication and proper leadership are essential components of teamwork (Hanzu-Pazara et al. 2012; The Navigator 2014). These important skills were not adequately addressed in the early versions of the STCW

Convention, but in recognising the significance of these skills in officers' performance, the revised Convention requires deck and engine officers to be trained for leadership, teamwork and managerial skills.

Research findings include concerns about the officers' skills gap in this area. One of the officers stated that:

The nature of the job demands not only technical skills but also to know how to safely and efficiently work in a team...depending on the officers' role in the team they need to know how to manage, to lead the teamwork...these are the skills which are necessary for a teamwork and it can be gained mostly by practice...team members need to know how to communicate...the issue of multi-nationality of team members is also another issue which needs special consideration. People working sometimes with different knowledge, different background, different cultures - all of these factors make the teamwork very delicate and sometimes complex. (SF21)

Most of the interviewees, especially those working on board ships with multinational crew, reiterated these views on the education and training gap, believing that social and cultural issues had significant implications on many aspects of the working life of the seafarers, including teamwork.

One of the captains said that:

...Working with multinational crew needs a good understanding about the social and cultural issues which seriously affect the working environment...in the STCW requirement for social training there is only a short course, I think it is only one day training, called 'personal safety and social responsibility' course, but considering the importance of the social issues this short training is not enough...efficient teamwork needs people with good knowledge, efficient communication and very importantly good understanding about the social and cultural issues which affect the workplace...It means that officers need 'competence' to be efficient in the shipboard teamwork. 'Competence' is not only having knowledge and skills; it includes 'attitude' as well and 'attitude' can be improved through practice...we need 'competent' officers and it is far beyond being only 'knowledgeable' and 'skilful'. (SF1)

Another officer recognised the communication skills gap and stated that:



...there is a communication problem on board ships and officers from some countries have a problem communicating in English but the communication issue is more than just having ability to speak in English; What is needed is what I call 'professional interaction'...I think the training on communications is merely focused on the 'language' but officers have a gap, as I said, in professional interaction. (SF7)

One of the captains elaborated on the managerial role and responsibilities of the senior officers and stated that:

In the shipboard organisation chart, the chief officer is head of the deck department and chief engineer is head of engine department. Heads of departments need to know how to manage the job and the people. But, this is the area which I have seen a skills gap in officers. I had a few chief officers who could not manage the deck officers and deck crew. There was always conflict and chaos...I don't know how those people want to control and manage a ship when they become captain. (SF5)

While recognising the need for theoretical training in this area, the officers' accounts indicated that they believed most of these skills needed to be gained in practice while performing a task in a teamwork setting. As one of the interviewees stated:

...we used to spend most of our time on board ship and learning while we were working. We learned not only about technicalities but we were taught how to live at sea. We learned to efficiently communicate, to take responsibility, to manage small tasks. We had opportunity to observe groups of different people from deck and engine department performing a common task in a team or how to coordinate and cooperate in emergency drills. Then we were given the opportunity to be a member of those teams and practice. It is not only the issue of having the knowledge. You need to learn how and when to use your knowledge, and that is why it is called 'skill'...of course there are some theories about management, leadership and teamwork but these skills cannot be gained only in the classrooms. Cadets and officers need to be given the opportunity to practice and develop their skills in these subjects. (SF21)

By and large, it was perceived by the officers that communication, teamwork, leadership and management were interrelated and the skills gap in this area could have a significant impact on the safety and overall performance of the ships.

### **6.3.4 ‘Officer Like Qualities’ (OLQ)**

Research findings suggest that most of the officers’ perceived the issue of ‘OLQ’ to be broader than that defined in Chapter Five (5.3.6). From their point of view, OLQ was not only about leadership and the qualities a leader should have, but it also embraced ‘discipline’ and ‘social skills’. Officers perceived a skills gap in this area and attributed this shortcoming to the contemporary structure of the training system. One of the officers stated that:

...these things [leadership and management] need to be taught to the officers from very early stages of their training, starting from cadetship and practice to be a leader and a manager...I remember in college we used to observe strict disciplines. In turn we were appointed to be leaders of the groups of cadets. It was a role-play; we called it ‘cadet captain’. This was how they trained us to develop our leadership and managerial skills within our small community in college. This was a social activity...but those practices are not observed in most of the colleges anymore. We were attending full-time College where we were living and being trained there. Now, there are many colleges that they do not have those sort of campus life...I have heard that cadets attend classes and then after lectures they go home. So, those disciplined procedures through which the trainees could develop their social and managerial skills are eliminated...I perceive that there is a sort of lack of ‘officer-like quality’ in some of the officers. (SF7)

Although the new provisions of the STCW Convention have addressed the training for leadership and management, the interviewees perceived that these provisions were not sufficient to bridge the gaps in this area.

### **6.3.5 Commercial Activities Knowledge**

The issue of commercial activities knowledge, also referred to as business awareness, was not a common concern of the interviewees but a few elaborated on what they regarded as a knowledge and skills gap in this area. One of the officers stated that:

Commercial activity is an important part of the shipping business and I know that. But, for me the safety issues come first...in the college we have a small amount of commercial subjects compared to technical and safety-related subjects trainings...what I have learned commercially is mostly what I experienced on board ship...I know that STCW is not concerned about commercial subjects and is mostly about regulations, technical subjects and safety. However, to do our job according to the job description

on board ship, we need to know a lot more than what we are offered in college...I think there is a gap there...some companies provide extra training for commercial activities and it really helps the officers to do their job. (SF11)

Most of the interviewees stated that their main concern about the officers' knowledge and skills gap involved safety-related issues. While having commercial knowledge was perceived to be necessary for the officers to perform their shipboard duties, they considered this to be less important and gave it less priority. The shipping companies were expected to support this training, based on their commercial needs.

Measures suggested by the officers to bridge the perceived knowledge and skills gap were to increase on-board training time for officer cadets and give them the opportunity of gaining more experience, to promote the peer-mentoring spirit on board ships, to eliminate the fast promotion strategy of shipping companies and to obtain support from companies for the provision of extra training.

In the next section the officers' accounts regarding impediments to training are presented.

## **6.4 Impediments to the Education and Training of the Officers, as Perceived by the Informants**

Research findings show that officers were, to some extent, aware of the factors that impose limitations on what can be expected of training under the current policies and socio-economic situation. They attributed the impediments to a range of issues including the objectives and content of the STCW and variations in implementation of the Convention within the current structure of the MET system, the training institutes' resources, the diversity of ship types and equipment and last but not least, the quality of intakes and personal motivation. In this section, the officers' perceptions in this regard will be examined.

### **6.4.1 The STCW Convention as the 'Minimum' Standard**

The officers' accounts suggested that while they generally recognised and appreciated the spirit and aim of the STCW Convention in attempting to standardise the education, they had some significant criticisms about it. They attributed the problems of the STCW Convention to its objective in defining only 'minimum' requirements for the education and training of the

officers, as well as the way it is interpreted and implemented within the MET system. As one of the officers stated:

I personally support the idea of having sets of standards for training of seafarers. Where we have multinational crew on board the majority of the merchant ships it is absolutely necessary and it is good to have STCW Convention. Without that, how could I know that the officer who is coming on board ship has been trained at least to a minimum standard? Having said that, it does not mean that I am completely happy with that. I think there are some problems with the Convention as well...a major problem is that it is only 'minimum' requirement of training...when the officer is trained and certified, everybody, especially ship owners, expect that the officers should know everything, and this is wrong. The company says that the officer has CoC, so should be able to do his job. I know that this is not a fair expectation...how can you train an officer for minimum requirement and expect him to be ready for doing everything you ask him to do? (SF10)

Another officer, in criticising the STCW Convention, stated that:

...sticking just to the minimum requirements of training STCW requirements does not guarantee the officers to be competent...the shipboard tasks need a comprehensive knowledge and skills which cannot be achieved by providing only the minimum training. It could have been logical to start the standardisation with minimum requirements but after many decades from its introduction, it seems not to be enough for now. (SF20)

The above statements demonstrate that officers not only criticised the Convention for its objectives, being a 'minimum' requirement, but at the same time they claimed the industry stakeholders, more specifically the shipping companies, did not have realistic expectations of officers who were trained and certified based on minimum requirements. Moreover, some of the officers believed that the Convention and its implementation in its existing state did not sufficiently address the industry and the officers' actual training needs.

In addition to the views described above, some of the officers considered the shipping companies to be partially responsible for keeping the STCW Convention as the minimum requirement. They felt that the companies had influenced the policy decisions of their maritime administrations, pressurising them to retain the minimum requirements in order to reduce the training costs.

One of the ship's captains stated that:

Shipping companies are always trying to minimise their costs. There are still the good shipping companies who care about the training of their crew, let alone the other shipping companies who do not care about training of their personnel and do not pay for it at all...The ship owners forced administrations to reduce the training period. They stick only to the minimum training requirements of the STCW and they want the administrations to keep it and implement it as minimum. (SF8)

One of the reasons why the STCW Convention remains as the minimum requirement was therefore attributed to the ship owners pushing the administrations to keep it at a minimum.

#### **6.4.2 Inconsistency in the Implementation of the STCW Convention**

While the provisions of the STCW Convention, even in defining the 'minimum' requirements of knowledge and skills, remained an issue (see 6.2. and 6.3), the implementation of the Convention was another concern of the officers. The findings of this research indicate that the officers perceived that despite the STCW Convention being in place in the industry for many years, seafarers being trained and certified in different countries were still not uniformly trained and were not considered uniformly competent. A ship's captain reflected his opinion about inconsistencies in the competence of officers from different countries and partially attributed this issue to the implementation of the Convention and differences in the MET system:

...I have been working with many officers from different countries. Although the officers boarding my ship are all certified as per STCW Convention I think that the seafarers trained in different countries have different standards and abilities...I think STCW Convention is a big step forward in introducing uniform standards of training but it sounds to me that the countries do not implement the STCW requirements uniformly...maritime authorities of the countries should take more effective steps in implementing the regulations and ensure that the training institutes are also compliant. (SF6)

The STCW Convention holds the maritime administrations accountable for the appropriate implementation of the training standards within their countries. However, research findings suggest that officers are concerned about this issue and sceptical whether the Convention is being uniformly implemented in different countries.

### **6.4.3 Limitations to the Colleges' Resources and their Inconsistency in Compliance**

In the different socio-economic settings of the global labour supplying countries, the maritime training centres have different capacities to facilitate the necessary infrastructure, hardware and software to adequately implement the STCW requirements and provide appropriate education and training to the trainees. According to the STCW Convention, it remains the responsibility of the maritime administrations to frequently audit their MET system in order to ensure that the training centres have sufficient resources to conduct the training programmes.

However, the interviews with the officers suggested that they had significant concerns about the colleges' resources and the way the training courses were provided. The shortcomings were mostly attributed to the training facilities, instructors, classrooms, libraries and reading material, curricula and duration of the training courses and, very importantly, workshops and simulators. Some of these issues have already been discussed in section 6.3, where officers' accounts were presented regarding the nature of the knowledge and skills gap, but some of the prominent concerns will be revisited here.

The importance of the role of instructors in the education and training process is well recognised. This is one of the issues that officers frequently emphasised in their accounts and they perceived that they had a significant impact on the quality of the officers' training. While a few of the interviewees recalled instructors who had provided excellent training which had helped them build up their competency, most of the interviewees claimed that the lack of competent instructors in colleges was one of their main concerns. This issue, along with poor training facilities such as simulators and workshops, exacerbated the officers' impression that their training was inadequate. A chief engineer pointed out that:

In the college that I attended for my chief engineer course, the instructors did not have knowledge and experience of new machinery on board ships...Most of them were last at sea at least a decade ago. How could they teach me about something which they have not seen? Some of the instructors were not even marine engineers. They were university graduates. They did not know much about working on board ship...this was not the only problem. The workshop's equipment and machinery were also outdated...they said that the new workshop facilities are very expensive and college cannot afford the expenses...I had to pay for my training and this was the reason why

I picked this college with relatively lower tuition fees. There were better colleges with better facilities but I could not afford it. (SF16)

One of the officers stated that:

The college facilities were really poor. The classrooms, training facilities and more importantly the main subjects, such as damage control and ship-handling, instructors were not experienced. The simulator they used for ship-handling was only a PC-based simulation which is ridiculous. I do not know how the Administration approves these PCs to be used instead of real simulators...some of my friends who could afford to pay more, attended good colleges. Some people also get their training fees paid by their companies...They said that the training facilities were good...when I compared my course duration and the detailed subjects with those who went to good colleges, I could easily notice that not only their training duration was longer but their course contents were also far better and more updated than those they provided in my college...It could be interesting for you to know that both of the colleges I told you about are in the same country but I do not know how the Administration has approved colleges with such variations. (SF22)

The officers perceived that colleges were at liberty to interpret the STCW Convention requirements and that this was demonstrated by the inconsistencies in their infrastructure and resources and the duration and content of their training courses. The officers categorised the colleges as being of good and poor quality. While there are reputable colleges who are offering training courses, these were regarded as costly and not always available. This, coupled with the perceived lack of interest from shipping companies in providing financial support for the training of their workforce, made such colleges prohibitively expensive.

#### **6.4.4 Diminishing Training Support from the Ship Owners**

One of the main issues to emerge from the globalisation of the industry was the ship owners' rapid inclination towards a global labour market where they could find a readily-trained and available workforce. According to the interviewees, most of the ship owners seemed not to have any interest in supporting the education and training of their seafarers. It was their perception that ship owners would rather compromise and even ignore the importance of training issues and retention of the seafarers, being more likely to poach the trained workforce from the market. The research findings showed that officers perceived that attending good

colleges with better facilities could have a significant impact on their knowledge, skills and overall competence. However, they considered the diminishing training support by the ship owners to be one of the important factors which limited the training being provided to the officers through cheap training programmes. One of the officers stated that:

... Previously, if officers had a training need, the company could support them to attend the necessary courses but nowadays I can see if there is a problem with a seafarer's performance, the company ask them to go and find and attend the necessary training during their leave period. If they want to join the same company, they are asked to provide evidence of attending extra courses otherwise they will not sign the next contract with them. The training fees are all on the officers. So, they mostly attend the cheapest available training course and this issue limits the training efficiency. (SF18)

Officers further stated that the issue of training support by the shipping companies was beneficial for both the company and the officers. They thought that providing better training to the officers, which was more likely to be affordable by companies than individuals, could have a positive impact on the competency of the officers. This would enhance the safety of the ships and in return, officers would remain loyal to their employers, providing a high-quality workforce that would benefit the companies in the long term.

#### **6.4.5 Crew Reduction and Job Intensification**

According to the research data, there was a common view amongst the interviewees that crew reduction and job intensification had negatively affected the issue of on-board training. With the introduction of new technology and the new generation of ships with advanced equipment and machinery, along with the “globally depressed shipping market” (National Research Council 1990), the manning scale of the ships has been reduced from an average of 40 during the 1960s to less than 15 from the late 1980s onwards (Grove 1989; National Research Council 1994; Winchester et al. 2006; Smith 2007). Research data suggests that these factors, taken together, had a significant effect on training and peer-mentoring on board ships. One of the interviewees stated that:

Twenty years ago, we had more officers and ratings on board ship. Now we don't have radio officers, catering officers, fifth engineers, motor technicians and the ratings are also much less than before. I agree that technology and automation have improved the efficiency but this doesn't mean that all of the jobs which were handled by those



eliminated crew do not exist anymore. The tasks are there and now those have been added to the tasks of the remaining crew...even the new regulations are adding up the tasks and responsibilities of individuals, the number of ship inspections are increased and these things all cause the extensive workload on the seafarers... shipping companies are always trying to reduce the number of crew and this makes the workloads even more... all of these things are affecting the on-board training and the people do not have time to interact and learn from each other. (SF1)

Another officer stated that:

...The people do not find enough time to provide mentoring to newcomers, cadets and juniors...the people used to learn from each other on the job and more importantly in the social interaction. (SF14)

It can be seen from the officers' accounts that the reduction in the number of crew, job intensification and fatigue were perceived as having affected the on-board working life of the officers, including their social interaction. This was considered to have had a limiting effect on the on-board training and tradition of peer mentoring.

#### **6.4.6 Multinational Crew and its Drawbacks for Peer Mentoring On Board**

According to the research data, since the introduction of multinational crew on board ships, the different native languages of the crew members have become a problem for on-board communication. Although the common language in international shipping is defined as English, not all the multinational crew were regarded as adequately conversant with this common language. This was considered by the officers to be one of the drawbacks of a multinational crew which adversely affected on-board training and peer mentoring.

Other issues relating to a multinational crew were identified as being social isolation and a reduction in recreation time spent with other crew members. Lack of social interaction was seen to have a detrimental effect on experience exchange among officers which, in turn, affected their ability to learn from other members of the shipboard community.

One of the chief engineers stated that:

...The crew are not too keen to get along with each other and friendships are not as strong as we had experienced years ago. I remember when I was sailing on board my national fleet ships, we were all country-mates and we used to interact with each other easily. We had enough time to spend together in our free time. We were not only socialising but we were learning a lot from our shipmates. In duty mess [the room used during working hours for tea or coffee breaks] a lot of the technical issues were discussed and that was a good time to learn from others' experiences. (SF13)

It can be inferred that the multinational crew, as the product of the global shipping labour market, has its own disadvantages for the effectiveness of on-board training.

#### **6.4.7 Diversity of Ship Types and Equipment**

Interview data suggests that the diversity of ship types and equipment is perceived to be another factor that limits what can be expected from training. The ever-increasing variety of marine equipment being introduced on board ships by different manufacturers makes it very challenging for the MET system to cope, not only with upgrading their hardware and software, but also with the time needed to train the officers to operate all the equipment. Additionally, the limitation in time allocated for the officers' training makes it impracticable to learn about diversity of equipment. As one of the officers stated:

On board ships, I see different equipment and machineries that needs detailed trainings for operation, fault-finding and repairs. It is very difficult for the officers to learn about all of those equipment...manufacturers should get together and standardise their productions. (SF17)

This issue needs a collective consideration by the ship builders, manufacturers and the shipping companies to facilitate the standardisation of the ships' equipment.

#### **6.4.8 Quality of Intakes and Personal Motivation**

As discussed in earlier chapters, attracting the new workforce to the industry has been a big issue for a few decades, especially within the TMNs (Cockroft 2003; Cahoon 2009; ETF 2011; BIMCO/ICS 2015). At one time seafaring was considered to be a very well-paid and prestigious job from the public point of view, but with the introduction of the new job markets ashore with relatively high salaries, as well as the ship owners' tendency to attract cheap labour

in order to remain competitive in the market, the situation has changed. Fewer young people are willing to join the merchant navy and some of the workforces being attracted to seafaring jobs do not regard their jobs as long-term careers. This short-term approach was seen by the interviewees to be adversely affecting the trainees' desire to adequately learn and do the job. This was considered as one of the issues which limited what could be expected from training.

One captain stated that:

It is very important to attract the right people for this job... attitude and quality of the trainees are very important in the training process...I know the industry is facing problems in attracting young people with good quality for this job...It makes it difficult when it comes to train them...this is a very delicate job that needs bright people, especially new generation for the highly advanced, specialised and fast ships...this is not anymore, as had been fifty years ago, only to be physically strong and fit to step into the seafaring job. Officers need to be bright and learn a range of diverse subjects during their training. For example, think about subjects a deck cadet should learn in a short period of time on top of the basic science such as maths, physics, includes navigation, ship construction, ship stability, rules, regulations, meteorology, machinery, seamanship, principles of dozens of advanced equipment like Radar, ARPA, ECDIS, GMDSS and communication, AIS, etc., etc. If the quality of the cadet or officers is not good then they cannot catch up with the education and then the problem is not with the training rather it is the problem with the trainee...once the right cadet is not being trained for this job, it will be a long-standing problem because we will have problem with that person as an officer and when you want to teach them something on the job. (SF1)

The research findings highlighted an important issue with regard to the officer cadets' and officers' motivation and enthusiasm for learning. This was one of the aspects which some of the senior officers addressed during the interviews. It is important to look at the incentives of the people who choose seafaring as a career. Some of the senior officers perceived a difference in attitude towards learning of those people who chose seafaring as a long-term career to those who had stepped into sea-life as a short-term job. One of the captains stated that:

...Some of the cadets come on board ships who are fully devoted to learn...They want to stay in this job and they aim to reach the highest ranks. It is much easier to teach these groups of people when they are cadets and easier to work with them when they become officers. They are self-motivated. They are keen to learn...but there are groups

of people who embark on this career for their own reasons such as they find it difficult to get a well-paid job ashore and financial incentives influence them to come on board ship and work for few years and then leave the job. I have been sailing with these sorts of people also. I don't want to generalise them but it is mostly difficult to convince them to learn and to do their job properly. For this group of people it is not important how good the maritime education and training systems to be, they are not eager to devote themselves to this profession. (SF8)

It can be perceived from the officers' accounts that the quality of intake and personal motivation are important factors in the education and training process that can limit its effectiveness.

## **6.5 Summary**

It was the common perception of the informants that a skills and competency gap existed among a considerable population of the merchant ship officers. The interview data suggested that, from the officers' point of view, the nature of the existing gap ranged from technical knowledge and practical ability to the social skills the officers needed to fulfil their assigned duties. Comprehensive information provided by the interviewees indicated that they were well informed about the nature of the skills and competency gap and some of the associated underlying reasons for such shortcomings.

The perceptions of the informants about the gap were built upon their own experiences as well as their observations on the performance of others. There were a range of information sources which informed their perceptions, including the performance-monitoring mechanisms on board ships, the results of the inspections and audits, accident and incidents reports and industry accounts.

While the merchant ship officers were mainly in favour of the existence of the STCW Convention, they had important concerns about its provisions. Their criticisms included the inclusion of outdated theoretical subjects in the current version of the Convention, which they felt should be replaced with theoretical knowledge pertaining to the new technology and equipment. They were also concerned about the new social settings of the merchant ships. One of the most prominent concerns of the interviewees was regarding the practical training provisions of the STCW Convention, with the drastic reduction in practical on-board training

and its replacement with sometimes ill-resourced college-based workshop and simulator training. Informants perceived that there was a wide range in the quality of training providers in the MET system and they claimed that the maritime administrations had not been able to uniformly implement the Convention.

The underlying reasons for the shortcomings and limitations to the education and training of the officers were perceived by the interviewees to embrace a wide range of factors. These can mainly be attributed to globalisation and the advancement of technology which have radically transformed the education, training and working lives of the seafarers.

In the next chapter, the research data relating to the trainers' perceptions about the STCW Convention provisions, the contemporary MET system, and the overall competency and skills gap of the merchant ship officers will be examined.

# CHAPTER SEVEN

## Research Findings: Trainers' Accounts

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### 7.1 Introduction

The role of training establishments and 'trainers' in producing a competent workforce is well recognised and 'trainers' are probably the most important agents in the educational process (Guadalupe 2010). In the shipping industry, maritime education and training centres play an important role in providing training courses to the workforce to bridge the skills shortage and skills gap of the industry. In the preceding chapters, we have seen how the need for a skilful and competent shipping labour force has been a concern, particularly in the last few decades. The significance of the training in the production of such a labour force is highlighted below by the IMO's Head of the Maritime Training and Human Element Section:

Effective training is crucial in maintaining the quality and fitness for purpose of seafarers and should be the responsibility not only of seafarers but all stakeholders in the industry. An effective, updated, competence-based training and assessment system, complemented by ship-based in-service training, and re-training and refresher programmes, where necessary, will ensure that seafarers globally would be able to fully support the IMO mission statement of 'safe, secure and efficient shipping on clean oceans' (Fuazudeen 2008b, p. 8).

Previous chapters highlighted the knowing-doing gap of the merchant ship officers, as perceived by the ship owners and officers, in whose accounts concerns were raised about the provision of training. Having recognised the significant role of the educators in the MET system, I was interested in giving voice to the trainers through interviews and to examine the training implications of the current Convention and regulations.

The trainers were interviewed in two stages. During the first stage, trainers were asked to elaborate on their views about the MET system and the STCW 95 Convention requirements. However, the comprehensive revisions made to the Convention in 2010 necessitated a return to the field to seek the trainers' perceptions of the changes to the new Convention and to assess whether they felt the changes were likely to overcome the perceived weaknesses in the current

arrangements. Given that the full implementation deadline of the new Convention was January 2017, it is too early to assess the impact of new training arrangements. As I could not get relevant information from the ship owners and officers regarding the impact of STCW 2010 (see 4.6.1), I focussed on the perceptions of trainers from a number of institutes.

Qualitative information obtained from interviews with trainers is presented in this chapter and the prominent issues and concerns raised by these informants with regard to the research questions and the aims of the study are discussed. For this purpose, the following research questions were addressed through the qualitative interviews:

- 1. What informs the trainers' perceptions, concerning the ship officers' skills and competency gap?*
- 2. What is the nature of the perceived skills gap, as understood by trainers?*
- 3. What are the impediments to the education and training of the officers, as perceived by the trainers?*
- 4. Are the perceived gaps between training being provided to the officers and the actual skills they need to perform their assigned duties adequately addressed by the trainers?*

The trainers' responses to the first three questions are discussed in this chapter and their answers to the fourth question form part of the Discussion and Analysis chapter.

## **7.2 What Informs the Trainers' Perception About the Skills Gap?**

During the course of the interviews, trainers<sup>47</sup> expressed their concerns about the skills and competency gap of the merchant ship officers. The views offered were typically based on information they had gathered 'internally' within their institutions, such as course evaluation records and examination results, as well as information they received 'externally' through concerned maritime administrations, shipping companies, information disseminated in

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<sup>47</sup> In this research the term 'trainer' does not necessarily mean 'instructor' but connotes all interviewees in the training institutes, e.g. Dean, Director, curriculum leader.

professional publications within the industry, and through MET-related seminars and conferences.

### **7.2.1 Internal Information – Course Evaluations**

Almost all of the approved training institutes were required by both the maritime administrations and the STCW Convention (IMO 2011, p. 29), to have a course evaluation scheme in place to ensure they were meeting the required ‘quality standards’.

The interview data suggests that the course evaluation scheme has been a successful means of gathering the information from the trainees to gain their opinions regarding the courses they have undertaken. The main issues raised in their course evaluation feedback were the need for increasing the duration of courses, changing course content, appointing suitable lecturers, improving quality of workshops and simulators and enhancing the quality of reading materials and libraries.

However, the trainers interviewed expressed caution about responding to and implementing the information and requests they received in feedback from their students. In particular, they were worried that the trainees may not be able to perceive what needed to be taught on the courses or feel confident to criticise the training establishment. For example, one of the trainers stated that:

We get course evaluation feedbacks from the cadets and officers who attend the course. Some of the suggestions received are valid but some of the suggestions seems to us to be odd because the trainees, especially officer cadets, mostly do not have a thorough understanding of what they actually need to know and they also do not have a holistic idea of the MET system and the limitations which the training institutes have, especially regarding the vast amount of knowledge which needs to be taught during a limited period of time. Hence, some of the feedbacks we receive sound odd and emotional. (TC7)<sup>48</sup>

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<sup>48</sup> TC: Training Institution – this code identifies the trainers’ accounts – see Appendix 2c



The trainers referred to the views of trainees as an additional source of information to identify the shortcomings of the training system. When interviewed, one of the training managers stated:

For most of the main courses we conduct, the evaluation forms are distributed among the trainees upon completion of the course, asking them how satisfactory they found the course. Of course, a variety of opinions and different levels of satisfaction are received from the trainees. It means that there are shortcomings to what the students expect from the course...The feedbacks are mostly not very surprising but, of course, we receive some weird requests as well...Sometimes they ask for increasing duration of a course or they raise their concern about a lecturer, workshop, simulator or even other training facilities such as available books and library resources. Though we would like to take actions to make the situation better, in many cases it will either be not feasible or it takes a long time to make the changes. (TC2)

Although the mechanism for identifying the gaps is available, the data suggests that trainers are limited in the action they feel able to take in response to the feedback. The dean of a training institute stated:

During the programme review meetings some important issues are raised but we can hardly make considerable changes to the course contents. The courses are mostly designed based on the IMO model courses. Our courses are approved by the Administration. For any change to the course content we need to reapply for validation of the course from the Administration. Any of these changes normally take a long time if it is decided to be applied. (TC3)

The limited amount of support received by the trainees from the shipping companies makes it impracticable to extend the courses. Maritime education and training is expensive (EASME 2016, p. 5) and the courses need to be conducted within specified periods unless extra funding is available to support the course extension and extra training. Some of the interviewees mentioned this issue to be one of the main reasons why changing the course programmes was challenging. The head of a training institute stated that:

...we have obligation for completing the courses within a specific period of time because the ship owners have agreed with the Administration to support the cadets

under tonnage tax scheme<sup>49</sup> and SMarT<sup>50</sup> funding for 150 weeks only. Further than that, the shipping companies do not compensate the expenses. So, we need to stick to the minimum requirements. (TC1)

Interview data suggests that although the special agreements and incentives, such as the tonnage tax scheme, may have advantages in helping the industry to overcome the skills shortage, at the same time, the possible disadvantages should not be overlooked. Ship owners under these schemes, in order to reduce the training costs imposed on them, stick to the agreements with the training providers for minimum requirement training.

It should be noted that the example in the above quote refers to a relatively high-standard MET system in a TMN where the informant considers it challenging to cover all necessary training within a period of 150 weeks. However, the literature review shows that in many other countries, the minimum training period is even less than in this example, which would exacerbate the problem. For example, in one of the other training centres interviewed, the training time was as short as 138 weeks.

## **7.2.2 Internal Information – Examination Results**

Examinations primarily aim to assess whether the individuals are successful at meeting the course objectives. However, data extracted from the results of examinations usually contain invaluable information that, in turn, can help to identify the training gaps.

During the course of the interview, the director of a training institute (TC7) elaborated on an interesting piece of information he had come across through the statistics he received from his departments. He perceived that systematic scrutiny of such data could have a great impact on course design. However, because of the lack of experts who could devote their time to analysing such data, this opportunity was being missed. He further stated that:

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<sup>49</sup> In order to increase the number of shipping companies based in the UK and subsequently increase the number of seafarers employed in the shipping industry, the ‘tonnage tax’ scheme was introduced in the UK in 2000. In this scheme the ship owners are persuaded to engage in the training scheme of the seafarers in return for reduced tax levied on them. (See Gekara 2008)

<sup>50</sup> The UK government, in order to increase funding for cadet training introduced a scheme called ‘Support for Maritime Training’ (SMarT) in 1998. The main aim of SMarT was to increase the number of officer trainees through providing financial support for cadet training from the government.

...the number of questions the students answer in each exam paper, especially *which* questions they have not attempted, or given wrong answer, in each paper are of great importance to realise the candidate's area of knowledge gap in that subject. In an ideal circumstance, exam papers of each individual could be assessed to find out whether the student has a significant knowledge gap in that subject. In my opinion, this is regardless of whether the student got the pass-mark or not. It means that if a student has not been able to answer a principal question that reflects his knowledge and understanding gap related to one of the main objectives of the course, it means that candidate has a problem with that subject. However, it is inevitable to let the students proceed because they have not 'failed' but it does not mean that the desired knowledge is obtained by them...this means that the gap exists...we have limitations in taking corrective actions. (TC7)

Despite having access to sufficient data through the assessment process to identify the training gaps, interview responses suggest that there are various reasons why such invaluable data is being overlooked. One of the reasons was attributed to the excessive workload of the lecturers and insufficient human resources in training institutes to analyse the examination results. Moreover, it is evident that the problem lies not only with the curriculum and content of the training but also with the pedagogy and the way the training is being delivered. One of the interviewees stated that:

...the examination result of each cadet or officer shows us in which area the trainee has lack of knowledge. Some of the questions are very important to be *attempted* in an exam paper...Rate of success in either written exams or practical assessment of candidates in simulators and workshops are very important...Not attempting a principal question in an exam paper or not being able to demonstrate the skills in practical exams does not necessarily mean that only the candidate has a problem but the problem could be with the training course and the way the training is delivered and the course is conducted...this can help the system to find out the real problem in the system...everybody is too busy in lecturing, doing tutorials, conducting workshops, running simulators and many other activities. Lecturers are all overloaded with many tasks. There is no time to use the information we already have which can be extracted from the examination statistics. (TC3)

Some of the interviewees stated that debriefing after assessment and examination was important to inform the candidates about their strengths and weaknesses and at the same time

improve the education and training system. For debriefing, the assessor needs to verify the whole assessment process and let the individual know about their performance. However, this area was mainly ignored in most of the training institutes where I conducted the interviews.

After an assessment or exam, it is very useful to have a debriefing session with the students. This will help them to know about the knowledge or skills gap...unfortunately we are not doing it because we do not have time to go through the papers or simulation again. (TC8)

Thoughtfully designed examination papers or assessment procedures can usefully measure the knowledge and skills of the trainees. At the same time, they show whether the training objectives have been met. However, the trainers have concerns in this area. As one of the interviewees stated:

I have seen many exam papers, from different training institutes, which are poorly designed. For example they do not cover the main topics of the course. They are mostly, as we say 'easy exam papers'. It means that only the easy topics of the subject are assessed through the exam paper. Maybe I should not say this in this interview but sometimes the training centres, in order to show high rate of success of the trainees and high pass mark rates, they set such 'unwritten policies' and ask the examiners to not set difficult exam papers... this means that the trainees are not assessed properly. (TC4)

The interview data further suggests that there are still significant gaps in the evaluation systems of the training institutes. Even the 'methods of demonstrating competence' listed in the competency table of the STCW Convention 2010 (see Chapter Two, Figure 2.3), are open to different interpretations. Training institutes and maritime administrations are at liberty to select the 'means of evaluation' from the relevant tables. From the trainers' point of view, this issue seems to be one of the prominent gaps within the STCW Convention. The head of the engine department of one of the training institutes stated that:

...the methods of demonstrating competence in the STCW 2010 tables are our reference for setting up the assessments. Training institutes are free to choose one or two methods among the options the STCW has offered. Some training institutes choose only one method but some other institutes with higher quality of training standards may choose a combination of two or three methods for assessment of the trainees' competence. This causes inconsistency in implementation of the STCW requirements

by the training institutes and it results in difference in quality of the graduates...So, although the assessment outcomes are valuable information in identifying the skills and knowledge gap of trainees, still the scope of what is being measured through the examinations is dubious. (TC8)

In addition to the course evaluation feedback and the examination results, the interviewees stated that they received important anecdotal information from the trainees that informed their perceptions about the seafarers' skills gap. In the next section, I will examine the views of trainers based on those anecdotes.

### **7.2.3 Internal Information – Anecdotes**

Interview data suggests that during informal conversations between the trainees and the educators, invaluable information arose that built up the trainer's perception about the research question. These anecdotes not only disclosed information about the skills and competency gap of the officers but also revealed a major problem with regard to on-board training. According to the interviewees, on many occasions officers who attended college for the second Certificate of Competency (from operational<sup>51</sup> to management<sup>52</sup> level courses), asked lecturers to start teaching the 'very basics'. From the trainers' point of view, such requests were, to some extent, understandable because they realised that officers might have forgotten some of the subjects or some parts of the theoretical knowledge after being away from college for a few years. But, in other cases they claimed the problem went far beyond what could be reasonably expected. The issues raised showed that the officers had fundamental problems in the subjects that they should have been taught for their first CoC. They believed that the trainees should have been conversant with those subjects in order to safely navigate their ships, or else the safety of the ships would have been compromised. Such informal requests are a means by which the trainers form their perceptions about the skills gap of the officers. One of the interviewees called it the informal way of knowing about the competency gap of the officers and stated:

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<sup>51</sup> 'Operational level' means the level of responsibility associated with serving as officer in charge of a navigational or engineering watch or as designated duty engineer for periodically unmanned machinery spaces.

<sup>52</sup> 'Management level' means the level of responsibility associated with serving as master, chief mate, chief engineer officer or second engineer officer on board a seagoing ship.

When an officer attends the college for his second Certificate of Competency it means that he is the holder of a valid Certificate of Competency and he has been serving on board ship for a specific period of time, which is sometimes a few years. When we commence the courses some of the officers [students] seem to have a problem in catching up with the lectures. Then they start asking me to start teaching them from basics. Those basics are the prerequisites of the course. But, it seems to us either they have forgotten them or they have never been taught about them [during the cadetship training]. For example, when I am teaching ARPA<sup>53</sup> and radar subject to a second officer who is attending a chief officer/master course and he doesn't know about some of the function keys of the ARPA and radar it clearly indicates that he has a big knowledge and skills gap. I wonder how some of these officers could manage to pass the exams and get their operational level CoCs. (TC5)

Interviewees pointed out another issue with regard to the knowledge and skills gap of the officers. Officers had admitted to feeling apprehensive about losing their jobs if they asked questions of the senior officers on board ships that might have disclosed their knowledge and skills gap. One of the interviewees stated that:

Some of the officers attending for their second CoC talk to the lecturers about their knowledge and skills gap. They even state that they do not dare to ask their senior officers to train them on board ship. They were anxious not to lose their jobs if the seniors knew about their skills gap and this issue makes them inhibited from approaching their seniors and learn from them. They find the college the only place they can ask their questions and fill their skills gap without being worried of being fired. (TC4)

This statement vividly indicates one of the important impediments to on-board training, especially when it comes to the knowledge transfer among the officers.<sup>54</sup> Despite there being provisions in the STCW 95 Convention, reiterated in the STCW 2010 (Regulation I/14 p. 32 & Resolution 11, p. 55) addressed to the ship owners to facilitate on-board training, data suggests that a significant gap still exists in this regard.

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<sup>53</sup> Automatic Radar Plotting Aids is an advanced type of marine radar

<sup>54</sup> It should be noted that this issue prevails for the officers and the research data does not suggest this issue to be valid for officer cadets.

In the next section I will look at the information trainers receive from external sources which informs their perception about the skills and competency gap of the seafarers.

#### **7.2.4 External Information – Maritime Administration Audits and Reports**

Another means by which trainers form their perceptions of the skills gap of the officers and officer cadets is through the information they receive externally from their maritime administration authorities. Based on the quality standards system of the administrations, which is part of the STCW Convention requirements, the administrations of the member states need to inspect their MET system, determine the shortcomings and take necessary actions to rectify the shortcomings. In this process, they are supposed to routinely audit the training centres, verify the effectiveness of the training provided to the trainees, and communicate the information as necessary with the concerned parties, including training institutes and the shipping companies. The training centres occasionally participate in the joint meetings with administrations during which the issue of shortcomings in the knowledge and skills of the seafarers is discussed. Moreover, they receive circulars from the administrations informing them about skills shortages of the seafarers. Although the educators sometimes find the audit outcomes useful, they typically view the administrations' audits as 'inefficient'.

One of the educators stated that:

The Administration conducts annual audits from our training centre...auditors take a quick look at some of our records and issue a few non-conformity reports and finish the audit and go. It seems to me that they just want to fulfil their quality system requirements and have evidence of showing that the institutes are audited...In rare cases when a good auditor attends our training centre, we find the result useful. In such a case, the natures of the non-conformities are valuable indicators for us to realise that the shortcomings to the training system exist...Moreover, maritime administration authorities disseminate information about the outcome of their audits, the statistics of CoC examination results of the officers and casualty reports on board ships. This information makes our perception about the problems in the education and training system in general and the skills and competency gap of the officers in particular. (TC7)

It is evident from the interview data that the administrations can have a significant role in detecting the skills gap of the merchant ship officers through different means such as inspection

and auditing of their MET system. However, reports of the audits carried out by the regulatory bodies such as IMO and European Maritime Safety Agency (EMSA) reveal that under-resourced maritime administrations, especially those of the newly emerged labour supplying countries, still have difficulties in implementation and compliance of the STCW Convention requirements in their countries.

### **7.2.5 External Information – Shipping Companies’ Feedback**

Information received from the shipping companies was another means by which the trainers’ perceptions about the skills and competency gap of the officers were formed. The feedback of the shipping companies sometimes suggested that the workforce being trained and certified was not skilful and competent. As one of the interviewees stated:

...Those shipping companies that they have their cadets and officers being trained in our training centre sometimes send their representatives to visit our facilities and during their visits, they even talk to their cadets and officers about the college facilities and the quality of training they receive. They [the companies] raise their issue and ask for changes, extra needs or improvements... We do as much as we practically can to fulfil their needs. However, they should know that we have also some limitations... Our training programmes are mostly generic and based on the STCW 2010 Conventions... If they need their ship-specific or company-specific training, then they need to ask for extra training and pay for that... what I suggest them is to prepare a better and more efficient training setting on board their ships in order to get their cadets and officers to acquire the skills in real life practice. They need to instruct their officers on board ships to take the cadets’ training seriously and practically train them... the fact is that the skills and competency gap exists. We all know about it. However, when receiving this information from ship owners, we realise the extent of the problems.  
(TC3)

Trainers’ accounts suggested that shipping companies’ feedback about the quality of the graduates was a useful source of information in building up their perception about the skills gap and helped them to think of possible improvements.



## 7.2.6 External Information – Media and Conferences

According to the interview data, attending maritime-related seminars and conferences as well as reading through industry periodicals helped the training institutes recognise the current education and training deficiencies and skills gaps of the seafarers, not only within their own institutions and countries but also internationally. One of the interviewees stated that:

...We try to send our delegates to attend main conferences and seminars regarding maritime education and training... Those are the places where we can hear the different stakeholders' voices. By knowing the industries' concerns about the education and training of the merchant ship officers and understanding the nature of the skills gap of the seafarers, we will have a better vision of our strengths and weaknesses that helps us to enhance our training programme and usefully respond to the industry needs.

(TC6)

Interview data suggested that having access to the shipping industry's periodicals was an invaluable resource for the training institutes which enabled them to see the extent to which the training being provided fulfilled the industry's needs and where the gaps might exist. Media and periodicals provided the training institutes with news about the latest technological changes and trends, manufacturers' new products, accident and incident reports, administrations' and ship owners' accounts and seafarers' voices, all of which they stated to be important to them. Such information helped the training providers realise what the present skills gaps of the merchant ship officers were and anticipate the future training needs in order to narrow down such skills gaps.

By and large, interview data suggests that there was a consensus among the trainers about the shortcomings in the MET system and in the STCW Convention provisions which have resulted in the skills and competency gap of the seafarers. In the next section the nature of such gaps, as perceived by the trainers, are examined.

## **7.3 What is the Nature of the Perceived Gaps, as Understood by the Trainers?**

Research findings that address this question are categorised into four broad areas: technical knowledge, practical skills, communication and team-working, and commercial activities knowledge (or business awareness).

### **7.3.1 Technical Knowledge**

It is essential for the people who are planning to step into a technical job to acquire adequate technical knowledge in order to tackle the assigned duties. Due to the technical nature of shipboard duties the merchant ship officers are similarly required to have appropriate technical knowledge and skills to handle the new generation of merchant ships, with technologically advanced and sophisticated machinery and controls. During the past few decades, concerned stakeholders have been trying to define and regulate the requirements for technical knowledge and ability of the seafarers on a global scale. The STCW Convention addresses these requirements. However, the interview data suggests that, from the trainers' point of view, there are still gaps in this area.

One of the main concerns that the trainers raised during the interviews was about the gap in the technical 'knowledge' of the trainees. They attributed the deficiency of the technical knowledge of the ship officers to many issues such as rapid changes in technology, the variety of ship types and machinery and equipment on board ships. Other issues included the quality of intakes to the industry, the trainees' lack of self-regulation, the tendency to only obtain exam pass-marks rather than understanding technical concepts, the administrations' and ship owners' inadequate response to their obligations for facilitating the seafarers training, the nature of the STCW Convention as the 'minimum training requirements' and a delayed response in applying and adopting changes to the STCW Convention.

The trainers acknowledged their important role in 'knowledge transfer' or, in other words, the education of the officers. However, they claimed that not all of the required knowledge could be transferred to the trainees in college within a limited period of time and with limited resources. They considered knowledge transfer on board ships and within the community of practice to play an important role in filling the knowledge gap of the officers.

The trainers attributed some of the shortcomings in the seafarers' knowledge to the rapid technological changes of the ships that made it difficult for the training institutes to cope with these changing needs. Changing course curricula to accommodate emerging knowledge, upgrading the workshops and simulators, as well as updating the knowledge and skills of the trainers, were some of the challenges and drawbacks. One of the trainers stated that:

Ship construction and shipboard technology and equipment are changing rapidly. So, we need to adjust and update our training. It is not very easy to keep updated. On the one hand, we have to follow the Administration directives and fulfil the STCW Convention requirements. Even when we realise changes are imminent, mostly we wait until it takes effect on the STCW requirements and the Administration's approval. The policy is to keep the training course cheap and affordable, especially for the self-sponsored students who are looking for a cheap course to attend and get their certificate. We should remain competitive. So, what is the point in rushing to provide training on top of the minimum requirement of the STCW? This means extra investment that in turn increases the tuition fees...Then, the bureaucracy of the curriculum changes is another step that takes a long time...very importantly, in many cases we find our lecturers not conversant with the new technologies. This is where we find it really difficult to cope with...Some of the trainees, especially those who attend the college for their second CoC, know more than our lecturers about some technology and equipment because they have seen the new equipment on board before coming here. It is not easy to upgrade the lecturers to the state where they can teach and transfer the knowledge to trainees. It will be handled somehow and the course will be conducted, but the outcome could not always be ideal because the instructors have not experienced working with them [new equipment and technology] on board ships.

(TC4)

Some of the interviewees attributed the knowledge gap of the seafarers partially to the shortcomings of the STCW Convention requirements. A prominent example given by the interviewees was the provision of standards of education and training for Electro-Technical Officers (ETO). This is a fairly new rank on board ships that replaces the traditional electricians or electrical officers. After the introduction of advanced electronic equipment on board ships, it became necessary to have officers with appropriate electronic as well as electrical knowledge to fulfil the technical tasks. According to the informants' statements, this has been one of the industry's demands for more than two decades, but only recently has the STCW 2010 set the subject standards for this rank. Some of the pioneer training institutes in different countries

designed and conducted the courses in response to the industry's need, but there was a big variation in the course contents and this was considered a gap in the training standards. This is one of the reasons for having electrical and electro-technical officers on board ships with different levels of knowledge. In other words, the officers have a knowledge gap because there was no standard to define expectations from the training centres when they were developing the course curricula. The trainers perceived that it would take a few years for the training institutes to be able to develop and deliver these courses uniformly.

The interviewees' concerns were not only about the college-based training courses but they feared that the electro-technical officers might face considerable difficulties when they went on board ship to complete the on-board training. They asserted that one of the reasons the electro-technical trainees would face problems with on-board training would be due to the limited number of electro-technical officers on board ship to mentor the trainees. (Normally each ship has only one electro-technical officer on board).

Diversity of the equipment on board different ship types, with which the trainees need to become conversant in a short period of time, is another issue that the interviewees raised. Some of the training institute interviewees suggested that the time allocated through the STCW 2010 Convention for sea service of this group of trainees would not be sufficient for them to develop their technical skills. They suggested that much of the equipment on board ships is very expensive for the colleges to purchase and many of the training institutes could not afford to provide all of this equipment for the purpose of training the electro-technical officers. They added that the colleges were even faced with challenges in providing the theoretical knowledge to this group of trainees, let alone the skills.

Interview data further suggests that irrespective of the quality and appropriateness of the subjects being delivered in the courses, the attitude of the trainees towards education and training has a significant effect on the training system output. Due to the constraints on the duration of the training programmes, it was not possible to teach all subjects in detail within the classroom. In order to learn, the trainees needed to show their personal commitment and take responsibility for their own studies. Moreover, people have different capacities in grasping knowledge. Therefore, the quality of intakes to the industry as well as the capacity of the individuals for self-regulation was an important issue in the teaching and learning process. According to the interviewees' statements, this was one of the reasons for the knowledge gap

of the trainees in general, and also for the different level of knowledge gained within a cohort of trainees. As one of trainers stated:

We have limited time to cover the entire syllabus. Therefore, it is not possible to teach everything in the classroom. The individuals should also know that not all subjects can be thoroughly taught in the classroom and they should read their books and handouts out of lecture times. Unfortunately, we are observing ‘getting the exams passed’ culture among the cadets and officers. Individuals’ tendency to only get the exam pass-marks rather than understanding the technical concepts. This tends to end up with having certified but incompetent officers. (TC8)

According to the interviewees’ accounts, the diversity of ship types and equipment made it impracticable to teach the trainees about all the equipment that they could encounter on board ships. The course curricula tried to convey the generic knowledge of the concepts to the trainees. This was supplemented by giving them the opportunity to practice on sample machinery and equipment which was available in the colleges’ workshops and simulators. However, the ship owners expected every detail to be taught in the college which is impracticable in the current MET system. The trainers regarded this as another reason for the perceived knowledge gap. One of the interviewees stated:

What is considered to be a ‘knowledge gap’ is when the cadets or officers come across equipment on board ship that they do not know the principals and procedures of how it works. The ship owners also consider it as a knowledge gap. We also know that is a knowledge gap. However, all of us should accept that colleges cannot cope with teaching ‘all’ ship type equipment... Sometimes we even advise the ship owners that it will be cheaper for them to change their shipboard equipment and make them uniform rather than sending their officers for extra training for ship-specific equipment. (TC4)

Another matter highlighted in the interviews concerned specific training for specialised ships. The STCW Convention has specific training requirements for officers of such ships. For example, the STCW 95 Convention has introduced training requirements for masters, officers and ratings on tankers in general. However, the new requirement of STCW 2010 has been split between oil tankers, chemical tankers and gas tankers to make it more specific for different types of tankers. Introducing the specific ship type training through STCW 2010 is claimed by the trainers to partly bridge the knowledge gap of the officers serving on specialised ships.

Some of the interviewees elaborated on other new requirements of STCW 2010 and considered them to have positive effects on enhancing the seafarers' knowledge. Examples given were the enhanced requirements for the officers' competence in management, leadership and team-working knowledge and skills. It is interesting to note that the interviewees from the TMN training centres mentioned that these subjects already existed in their curricula. They claimed to be proactive in detecting and bridging the gaps. The related course in the UK is titled 'Human Element, Leadership and Management' (HELM) and it has been conducted in the UK colleges for many years.

In this regard, most of the trainers stated that the principles and theories of management, leadership and team-working could be accommodated on the training curricula where they could provide the trainees with appropriate 'knowledge'. They had even designed workshops and role-playing scenarios to introduce a 'practical' element to the courses. However, they stated that students had expressed limited satisfaction with these courses on their evaluation forms. The trainers felt that, as these subjects had a more practical nature, they could be more suitably developed within the communities of practice on board ships.

Another prominent concern of the interviewees was the lack of adequate provisions in the STCW Convention for seafarers' awareness about social issues, especially on board ships with multinational crew. The only provision in the STCW Convention for this issue is presently covered through a very short course in the training colleges. The course falls under the title of 'Personal Safety and Social Responsibility' (IMO 2011, A-VI/1-4). The interviewees claimed that the content of the course and its duration was not enough to cover this important issue in the training programme. The STCW 2010 Convention has not moved any further in addressing this issue. The interviewees perceived that addressing the social issues and providing the appropriate training for the officers in this area could have a significant effect, not only on the social life of the officers, but also on their understanding of the social interaction and community of practice that in turn could improve the knowledge and skills transfer and peer mentoring on board ships.

### **7.3.2 Practical Skills of the Trainees**

The education and training system of the merchant ship officers can broadly be divided into two parts, i.e. college-based and shipboard training. The college-based training is where the trainees are supposed to acquire most of the technical knowledge, supplemented by practical

training in workshops and simulators. On-board training is where the trainees have the opportunity to develop their practical skills and competence in a real workplace. Interview data suggests that trainers regarded the college-based training as better structured and regulated compared with the on-board training, which they considered to be 'less regulated'. Despite having provisions within the STCW Convention addressed to the ship owners, encouraging them to provide training berths and facilitate the on-board training of the cadets and officers, the trainers perceived that the requirements were not effectively implemented and that they did not have any control and authority to influence the on-board training situations. As one of the trainers stated:

We know that the college training has its own issues and flaws but at least we know that the setting is all for training purpose. I mean, we have control on our cadets. The college has training curriculum and specific trainers for each course. We have assessment system that is monitored by our staff. But, as soon as the cadets finish their college phase and go on board, we have very limited surveillance on them...when they return to college the only thing they have to show us is a training record book that we are not sure whether the tasks have genuinely been completed before the record book is signed by on-board officers... we receive complaints from them [cadets] that the officers did not care about their training...some cadets say that there is no time for the officers to train us. (TC7)

Under the contemporary maritime education and training systems it is common to provide most of the theoretical education of the seafarers in classrooms within the training institutes. Moreover, there are quite a number of subjects that need complementary training for skills development. This sort of practical training takes place in the workshops, simulators and laboratories of the training centres. In addition to the theoretical and practical training provided to the trainees within the maritime colleges, based on the STCW Convention, the trainees should go on board the ships and develop their skills in a real life community of practice. According to the data provided by the trainers during the interviews, there are significant shortcomings in the practical training of the trainees both in college and on board ship. The problem is partly attributed to the requirements of the STCW Convention with regard to the duration of hands-on practice on board ships. During the course of the interviews, most of the interviewees raised concerns about insufficient support from the ship owners for on-board training, which they regarded as the main training setting for the cadets and officers to gain their skills in real operations.

One of the interviewees stated that:

...theoretical knowledge is important but it is essential to put the cadets and officers in a practical setting where they can turn their knowledge into practice. This is where the actual skills can be developed...trainees should be given sufficient time to actually observe and do the tasks. About three to four decades ago, cadets were sent on board ship for quite a long time to develop their skills. In the STCW 95 Convention the requirements for on-board training were significantly reduced. For example for deck cadets it was reduced from almost 24 months to only 12 months and respectively reduced to only 6 months for the engine cadets. The policy makers assumed that the workshops and simulators can replace practical training on-board ship and in the workplace. Workshops, labs and simulators are good and they are an efficient means for skills development but I personally believe that there is still a big gap between simulator training and the actual practice on board ship...We have good workshops and simulators in this college compared to some of the other colleges I have visited. They have PC-based simulators and outdated workshops. This is one of the reasons why there is diversity and inconsistency in the quality of the officer cadets and officers being graduated from different colleges. In this situation, how can we expect the cadet to be certified and go directly on board ship, to navigation bridge or engine room and take independent watch? (TC1)

It is important to elaborate on the point made by some of the interviewees that increasing the duration of the sea service for the trainees through the requirements of the STCW Convention may not, per se, significantly enhance the on-board training under the current shipboard training settings. The ship owners and the on-board ship officers' dedication towards training is also required to assist the trainees to develop their skills while they are on board ships. As one trainer stated:

...In the new STCW Convention 2010 they have still the same requirement, as it was in the STCW 95, for the deck cadets, but the on-board training time has been increased for the engine cadets from 6 to 12 months. Apparently the idea was to bridge the skills gap of the cadets but in the way they have made it optional with the possibility of mixing workshops and shipboard practice, to totally cover the 12 months requirement, I reckon we will not see a significant improvement compared to the previous requirement, STCW 95 requirement...even if the sea service requirements for the cadets are increased to 24 months, as it was many years ago, under the current



circumstances, where the officers are not showing much interest in training the cadets, it can't be expected to have better outcome. (TC5)

One of the interviewees stated that although the STCW Convention 2010 reiterates the ship owners' role in facilitating the on-board training, the language used in the resolutions to keep the ship owners accountable is not binding. He stated that:

The STCW 2010 requirement does not impose any real obligation on the ship owners to support on-board training. They mostly use terms 'recommend' or 'encourages' in the Convention to persuade the ship owners to support the on-board training. The literature they use is not obligatory, that is the reason why the ship owners do not take it seriously. For example, they recommend the ship owners to provide berths for trainees but there is no real obligation on them to let the cadets to have access to the ships for on board training. That is the reason why the self-sponsored cadets have no option but are mostly obliged to find any available ship where they can join as a rating, with the hope that the officers will sign their training record book without receiving any genuine mentoring and training support on board. These cadets when they come back to college for the further college training phase they complain that they mostly were not allowed or did not have access to the bridge or the engine room and they could not really do what they were supposed to do according to their record books. They could only manage to get the officers to sign and stamp their record books. This is a big problem which causes the skills gap at the very early stages of the cadets' training which could have severe consequences on their future career and on the ship's safety. (TC7)

In addition to recognising the importance of the ship owners' support with regard to on-board training, the trainers also noted the adverse effect of abolishing the role of designated training officer on board ship. As one of them said:

Previously the shipping companies were supporting the education system by realising the necessity of sending groups of cadets on board ships accompanied by a designated training officer. In that way, we could assign our trainers in turn to go on board ships not only to train the cadets but also to upgrade their own knowledge and skills and get acquainted with the new ship-board technologies and procedures. This is not happening anymore and the shipping companies do not support that system. In that way we had full control on mentoring the cadets during their sea service. (TC7)

Another important issue which the trainers perceived to be adversely affecting the practical training of the cadets on board ship was attributed to the multi-nationality of crew complements. The educators stated that they observed a significant difference between the cadets who completed their sea-phase training on board their own national fleets, where the crew complement comprised mostly their own compatriots, with those who had been on board ships with multinational crew. They quoted from the feedback of the officer cadets where they claimed to receive better mentoring and training support on the national fleets and comparatively less support when boarding ships with multinational crew. They partially attributed the issue to the empathy between officers and the trainees from the same country and partially to the hindrance of communicating in a second language while working in multinational crew settings. Moreover, the ship types and their routes, and whether they experienced consecutive short voyages, such as container ships, or relatively long voyages, such as bulk carriers and tankers, also seems to have influenced the quality of the on-board training received. This is where the issues of the ships' manning scales and the fatigue of the officers have an influence on practical shipboard training.

One of the interviewees quoted from the cadets and officers who had returned to college and talked about their on-board experiences. He stated that:

...the cadets and even the officers talk about their shipboard experiences when they come to the college. They say that "working with the officers from our own country makes it easier to learn from them, we don't have communication problem and since we are from the same country they are easier to be approached." The officers also need to learn from their seniors and get prepared for promotion to the higher rank. They also say that "working on board national ships and working with our own nationals provide us with better opportunity to learn from them. They are enthusiastic to talk to us and share their experiences, while it is comparatively difficult to approach officers from other nationalities and convince them to dedicate some time to teach us." There are clear evidences for us that multinational crew complement, fatigue and social relationships on board have important effect on skills development of the cadets and officers on board ships. (TC3)

Despite recognition of the implications of practical training on board ships, I could not find any specific provision in the STCW 2010 Convention for officers in charge of on-board training to undergo special 'training for trainers' courses in order to obtain basic knowledge of how to train and evaluate the outcome of the training. However, this is one of the requirements

of the STCW Convention for those who are undertaking any sort of shore-based training for merchant seafarers. This issue will be further discussed in the Discussion and Analysis chapter.

### **7.3.3. Communication and Team-working**

During the past few decades, the growing number of multinational crews on board merchant ships has intensified the need for effective communication. This includes not only defining a common language, as the communication medium, but also promoting understanding of the cultural differences among shipmates (Wang and Zhang 2000; Horck 2006). Casualty investigation reports show lack of effective communication and team-working to be among the main causes of many catastrophic accidents on board ships (Winbow 2002; IIMS 2014; Evangelos [no date]). Seafarers' communication skills as well as their aptitude for efficiently performing their assigned duties within a team are two interrelated issues which have been highlighted throughout the industry. In response to this need, the STCW 2010 Convention has augmented the training requirements of the merchant ship officers to include the application of team-working, management and leadership skills.

During the course of the interviews, many trainers highlighted communication, management, leadership and team-working as important skills which the officers needed to have in order to successfully perform their assigned duties. In addressing this issue, one of the trainers stated that:

people working on board ships need to communicate efficiently but communication is a multifaceted issue and is much more than what some people perceive as 'talking'...seafarers should be able to efficiently communicate and demonstrate their ability and skills while working as part of a team on board ship. I can say that the technical knowledge can be taught in the classrooms, practical skills can be partially gained in the workshops and simulators. English language can also be taught in the college, but there is limitation to what can be taught to a cadet or officer about management and team-working in the classroom...These skills are partially instinctive, however these skills can also be developed, to a reasonable extent, through knowing the theories and observing and performing on the job. STCW 2010 has emphasised these skills and this is useful...we can teach theories of management and team-working but there is a limitation to what we provide in the classroom...people need to get the theoretical knowledge and go on board ship and observe the seniors and learn from them and also learn by doing and practice. (TC5)

In elaborating on the interview question about the nature of the perceived gap, one of the trainers raised the issue of problems relating to common language and communication and stated that:

...having the highest level of knowledge and technical skills is not enough to be considered a 'competent' officer. The officer needs to have ability to efficiently communicate on board ship. So, with having a multinational crew the importance of the common language and communication on board ship, between ships, and ship to shore becomes more prominent...on many occasions we see that some students for whom English is not their first language struggle in college to improve their English language skills but when they do their sea service and come back to the college we can clearly see that their English language has improved rapidly. This is very clear to us that improving communication skills and English language takes place better and faster when cadets interact with the seafarers on board ships. They learn many technical phrases and jargons that are important in their job. They might never learn those things in an English lab. (TC3)

Communication and team-working are two important issues on board ship. The STCW 2010 has enhanced the requirements for training in team-working skills for officers, but trainers claim that it is again something that is going to be added to the theoretical classroom-based training and less attention is given to the practical nature of the skills which need to be gained by working in 'communities of practice'.

#### **7.3.4 Commercial Activities Knowledge**

In Chapter Five, it was explained that the ship owners perceived a significant gap in the 'commercial activities knowledge' or 'business awareness' of officers. Although this subject was not among the main themes raised by the trainers, interviewees from training institutes were probed to elaborate on this theme in order to compare their opinions with the ship owners' expectations.

The interview informants from maritime institutes appreciated the commercial nature of the shipping business, which is primarily for revenue and profit making, but were of the opinion that the STCW Convention has not been developed for commercial purposes. Its main objectives are to promote safe shipping and protect the marine environment through the encouragement of the stakeholders and enforcement of the international regulations. Hence, it

should not be expected that the STCW Convention will address the commercial activities training requirements of the ship owners. Were the objectives of the Convention to include knowledge of commercial activities, there could be a conflict of interests between safety and profitability, as the former is costly but the latter involves minimising expenses.

One of the interviewees from a training institute stated that:

...commercial activities are very important but they are going to conflict with STCW in safety. They'll cut corners. So, my view is that shouldn't be inside the programme, but clearly I can recognise that a company may say we want to train you in that...I think that would be wrong for an administration to say your commercial aspects come first. No. In every case they don't. (TC6)

Another interviewee stated that there were some subjects in the STCW Convention where the commercial activities of the ships and the safety issues overlapped. This is where the training curriculum covered some aspects of commercial activity. However, the course content for those topics was not considered to be sufficient to cover all the commercial knowledge needed by the seafarers. Should the shipping companies, based on their specific activities and interests, require extra training to increase the commercial activity knowledge of their seafarers, the training institute had the capacity to develop and offer those courses on top of the STCW training curriculum. He stated that:

...the people complete 'chief mate courses'<sup>55</sup> and they don't really understand what is the meaning of a 'charter party' and what are the 'York Antwerp rules'<sup>56</sup> or 'Hamburg rules'<sup>57</sup>. They have no idea about that because this is not in the safety exams, I mean subjects like navigation and stability...There are some references to commercial practice [in the STCW Convention], of course, that should be on the chief mate level but how people are teaching that is again, here, the interpretation of elements of the Convention...Where are the bills of lading training? How can you, as a captain, sign

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<sup>55</sup> Also known as 'Class I Certificate of Competency', the course is the highest level of training provision for the deck officers in the STCW Convention.

<sup>56</sup> York-Antwerp Rules: Legal term used in ship business and law as a commercial codification of the law of general average, the maritime principle that specifies that all parties involved in a sea venture must proportionately share any losses that result from sacrifices made to the cargo to save the remainder.

<sup>57</sup> Hamburg Rules: Legal term used in ship business and law containing a set of rules governing the international shipment of goods.

a clean bill of lading and implicate yourself when the cargo suffers from ‘cargo sweat’ or ‘ship sweat’ and the consignee kicks that at the port of destination and tells you, "I'm not going to receive this cargo. You have spoiled it on transit." "No, no, no, it was damp and smelly." "No, I have a clean Bill of Lading." So, for example, the captain doesn't know what is the meaning of a clean Bill of Lading, and what are the consequences of providing a clean B/L to a cargo owner, what is the Letter of Indemnity, how far can the LOI protect him and protect the ship owner and many other important things... then they don't know about the difference between time charters and voyage charters, they don't know about ‘laycan’ days and ‘laytime’ and how they are supposed to consider their implications on the contracts of carriage. These are only a few examples of the issues which need to be specified as shipping companies’ requirements and more importantly, they can practically be experienced on board ships when the officers serve in junior ranks. But, how much they learn these things from their seniors, it is not clear and in the current situation, with multinational crew, language problem, fatigue, and many other factors, I am not sure to what extent the cadets and junior officers can learn from their seniors on board ship. (TC7)

From the interview data it was evident that although the training institutes perceived a gap in the education and training requirements of the officers in the commercial activities of the ships, they did not advocate the ship owners’ proposal that the STCW Convention should address this kind of skills gap. Rather, they thought that the shipping companies, based on their requirements, needed to ask for extra-curricular training to enhance their officers’ capabilities in the efficient operation of the commercial activities of the ships. The training institutes were capable of conducting courses to bridge this gap if the shipping companies incurred the expenses.

So far, in this chapter the means through which the trainers build up their perceptions about the knowledge and skills gap of the merchant ship cadets and officers and their perceptions of the nature of these gaps, have been examined. The next section will look at their perceptions of the factors that impose limitations on the training of the officers.

## **7.4 Impediments to the Education and Training of the Officers, as Perceived by the Trainers**

Just as the shipowners and officers recognised various factors that could limit the extent and effectiveness of the education and training being provided to the officers under the current MET system, so the trainers were equally aware of this issue. The factors causing limitations were mainly attributed to the objectives of the STCW Convention and current structure of the MET system, the limited durations of the courses, the quality of intakes and personal motivations, the diversity of ship types and equipment and, last but not least, the training institutes' resources. In this section, the educators' perception about this issue will be examined.

### **7.4.1 The STCW Convention as the 'Minimum' Standard**

The interview data suggests that the trainers attributed the limitations of what could be expected from the education and training partly to the objectives and nature of the Convention, which enforces only the 'minimum' training requirement for the seafarers. The extra training is not obligatory. Therefore, the training institutes are not supported by the main stakeholders, such as the ship owners, to provide comprehensive training to the seafarers in order to completely prepare them to carry out all of their shipboard assigned duties.

One of the training providers stated that:

The STCW Convention is the minimum requirement of training for officers and these requirements are mainly based on the safety issues. Everybody is thinking of spending the shortest time possible for the training and cheapest means of receiving the required training for certification. If the trainee is self-sponsored, which we have quite a number of them in our college, they want the training course to be short and cheap because they are paying for their own training. Not many of the shipping companies are also keen on paying for extra training... There are limitations to what we can offer during the limited time and according to the STCW requirements. It should not be expected from the 'minimum' training being delivered under the current system to fill all the gaps. (TC4)

The STCW code comprises two parts; Part A being mandatory standards and Part B recommendatory guidance regarding provisions of the Annex to the STCW Convention.

According to the trainers, many training centres are barely complying with the mandatory standards, let alone Part B which is recommendatory.

### **7.4.2 Quality of Intakes**

BIMCO/ICS<sup>58</sup> manpower studies have reported a noticeable skills shortage in the industry for almost two decades. However, their last study in 2015 showed good signs that the industry's supply and demand gap has narrowed. The study is mostly concerned about the 'skills shortage' and does not reflect much about the skills gap (BIMCO/ICS 2015). The interview data suggests that the traditional maritime nations, which were allegedly facing severe difficulty in attracting young people to the industry, are gradually picking up and the number of applicants is growing gradually. However, there is still a considerable gap in the quantity of the intakes on a global scale. It means that seafaring is no longer considered as an attractive profession and the new generation are not taking up shipping as their profession. A reduction in the number of applicants has led to lack of choice, leading to a reduction in the quality of the intakes and, in turn, a decline in training outcomes.

Interview data suggests that, just as good trainers play an important role in producing good training outcomes, so the quality of the trainees is also of paramount importance in achieving the training objectives. However, the trainers claimed that they did not have significant influence on the selection process of the shipping companies and the self-sponsored trainees had open access to join the training institutes and step into a seafaring career.

### **7.4.3 Personal Motivation and Self-regulation**

Some of the interviewees raised concerns about a lack of ability for self-regulation and a lack of self-awareness among some of the trainees. They attributed this issue to elements such as personal motivation and the trainees' incentives for stepping into a seafaring job. One of the trainers stated that:

... Providing the trainees with high quality training spaces, workshops, simulators, instructors, etc. are important and play a big role in quality of training, but I believe

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<sup>58</sup> Previously known as BIMCO/ISF manpower studies.



that enthusiasm, motivation and self-awareness of the individuals play a bigger role in achieving the training objectives...We frequently see people attending the same classrooms, workshops and being trained by the same instructor complete a course but the level of knowledge and skills they gain at the end of the course is considerably different. This is something out of our hands and depends on the personal motivations of the cadets and officers. I can consider this as a limitation to what can be expected from education and training...nowadays we can see quite a number of people who attend the courses do not look at this job as their lifetime career. That's why they are not enthusiastic to grasp the knowledge. They just want to attend the course because it is mandatory and they want to get their certificate. In this situation how do you expect the training to be effective? This is the point we reach that the training becomes ineffective. (TC5)

Another trainer who supported the idea that motivation and self-regulation have profound effects on training stated:

...We should keep the trainees motivated to complete the course. But, they should also show their enthusiasm in remaining in the course. There is the element of the person themselves. If you've got people motivated and willing to do that progression, they find a way and possibly that's, shall we say, that's a self-regulating system. The ones who are enthusiastic, keen, they are the ones who advance. (TC4)

Interview accounts suggest that the quality of the relationship between trainees and the shipping companies has a significant effect on the training outcomes. Those shipping companies that maintained the morale of their personnel by using different incentives, such as supporting their training expenses, experienced better results in their officers' quality, performance and competence. These trainees were observed by the trainers to be mostly highly-motivated, loyal and self-regulated during their college time. While the trainers recognised the impact of motivation and self-regulation on the teaching and learning process they stated that their own influence on the trainees' motivation to learn was limited.

#### **7.4.4 Diversity of Ship Types and Equipment**

In addition to the generic training requirements for merchant ship officers, the STCW Convention has specific requirements for education and training of the officers working on board ships of different sizes and propulsion capacities and specialised types of ships, such as

passenger ships, tankers, chemical carriers and gas tankers (IMO 2011, Chapter V). It is not only the type, class and capacity of the ship but also the diversity of the machinery and equipment mounted on board that makes it challenging for the training providers to encompass the training requirements for such assorted types of equipment. The training providers are aware of this and consider it as a factor that limits what can be expected from the shore-based training institutes.

...new equipment and machinery for the ships are rapidly manufactured and merchandised. You can find different types and brands of equipment built by manufacturers using different technologies. Apparently, there is no end to this trend. Ship owners mostly have this perception that in the training we provide to their officers they should be taught about all types of equipment and machinery that they have on board their ships. This is practically impossible. We provide generic training and where necessary provide typical equipment and machinery for practice. The ship owners and officers should realise that we have limitations to what training can provide. Limited budgets for buying equipment for workshops, limitations in our own instructors in being conversant with all types of machineries and equipment and the limitations in training course time are at least a few obvious reasons for not being able to do so... this could be considered as one of the limitations to training. We sometimes advise the ship owners to change and install uniform machinery and equipment on board their fleets. This sometimes costs them less, compared to what they should spend in training their personnel to learn how to work with different equipment... (TC3)

It can be perceived from the training providers' accounts that it is important that the stakeholders realise the limitations to what can be expected from the training and take necessary measures to fill the training gaps. One of the measures could be installing similar equipment and machinery on board all ships within a fleet. The industry may also need to seriously consider the issue of standardisation of the equipment and machinery of the ships in order to avoid overloading the shipboard personnel with unnecessary training which arises due to the diversity of the equipment and machinery.

#### **7.4.5 Limitations of Marine College Resources**

The reports of audits carried out in the main labour supplying countries by regulatory bodies such as IMO and EMSA, (see for example Dacanay 2015) suggest that a few decades from the establishment of a global shipping labour market and the shift of labour supply from TMNs,

not many of the newly emerged labour suppliers still have adequate resources to properly comply with the training standards. The interview data also suggests that the trainers are mostly aware and concerned about the limitations to the resources within their own colleges and also the disparity in resources between the training providers. From the interviewees' point of view, limitations in training resources are one of the root causes for the knowledge and skills gap of the trainees.

According to the trainers' accounts, a prominent aspect of the limitations to the college-based training was the quality and extent of the skills development in the real work place compared with what could be replicated in classrooms, workshops and simulators. This is what the trainers perceived as one of the major limitations to what could be expected from the college-based training.

One of the trainers explained these issues as follows:

Not many colleges have appropriate simulators and workshop facilities and equipment. Many colleges I have visited are under-resourced; they do not even have proper classrooms with necessary training aids. They only provide handouts to the cadets and they do not have a library. But, we are fortunate to have relatively reasonable facilities, good simulators and workshops which are facilitating the training we are providing to be relatively efficient. I do not want to say we do not have deficiencies in our resources but comparing us with many others [training institutes], we have reasonable standard...We provide training in the workshops and simulators. But, working on board ship with actual machinery and equipment during the actual ship operation has a lot better effect on skills development...When cadets and officers are being trained by simulators and workshops, they don't experience the pressure and stress which is necessary to realise what happens in a real situation. The interaction, conversation and jargons being used on board ships are not the things we can simulate here. (TC8)

They pointed out that the financial constraints and scant support received from the other stakeholders (i.e. ship owners and maritime administrations) exacerbated the situation. Under-resourced training colleges continue to struggle with providing appropriate facilities and training aids to trainees, recruit high-standard lecturers and upgrade their infrastructure. These issues were considered to be limitations to their resources and the interviewees stated that these limitations indeed undermined the output of the training systems.

## 7.5 Summary

In common with the perception of the ship owners and the officers, the interview data suggests that the trainers also recognised significant gaps in the knowledge, skills and competency of the merchant ship officers. The trainers had their own evidence in building up their perceptions, which were mostly based on their observations, information they received through training courses, course evaluations and examinations results, as well as the information they received from different stakeholders of the industry. The trainers' perceptions about the reasons for such shortcomings were diverse and ranged from limitations to the STCW Convention as the 'minimum' requirement for officers training, quality of the intakes, personal motivations, diversity of the ship types and equipment, limited or even no support being rendered by some ship owners (e.g. financial, involvement in officers' training schemes, providing on-board training berths) for the education and training of the officers and last but not least, limitations to the maritime colleges' resources (e.g. workshops, simulators, trainers).

The interviews showed that the educators clearly perceived that despite the introduction of the STCW 2010 Convention to the industry, which is claimed by the IMO to be a major revision to the previous version (STCW 95), there are still significant gaps in the provision of training for the officer cadets and the merchant ship officers. The perceived gaps encompass both theoretical education and the provision of practical training. However, the trainers attributed most of the 'skills gap' of the officers to the insufficient and poor practical training of the trainees, which has hardly been revised in the STCW 2010 provisions.

# CHAPTER EIGHT

## Discussion and Analysis: Knowledge, Skills and Competency Gap of the Merchant Ship Officers

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### 8.1 Introduction

Shipping has undergone fundamental structural transformations, predominantly in the wake of the globalisation of the industry and technological advancements in shipbuilding and equipment. The globalisation of the industry has entailed, inter alia, transformations in governance, the emergence of a global labour market as well as the introduction of new stakeholders in maritime education and training. At the same time, the industry has also witnessed advancements in technology and a subsequent requirement for new skills. These changes have necessitated standardised forms of training at a global level. However, setting standards at the global level, considering differences in priorities and interests of the various stakeholders and taking into account the differences in the socio-economic contexts of countries, is a challenge in any industry. The shipping industry has faced a similar challenge in setting a global standard for maritime education and training.

Bearing the aforementioned context in mind, the industry stakeholders have reached a compromise in settling for the minimum standards of education and training for seafarers as detailed in the STCW Convention. However, the implementation of the STCW Convention is carried out through the various MET systems of different countries and the research findings indicated that this may not necessarily lead to the training outcomes the Convention set out to achieve. In addition, the research findings also show differences in perceptions among the industry stakeholders regarding the skills that are actually needed of seafarers, the provisions laid out in the STCW Convention as well as the quality of training being delivered by training institutions.

This chapter presents a discussion and analysis of the stakeholders' accounts regarding the perceived gap in skills and competency of the merchant ship officers. It draws together the key

findings from the informants' accounts as well as an analysis of similarities and differences in their perceptions.

In the previous three chapters the perceptions of the employers (ship owners), the employees (officers) and the trainers (training institutions' representatives) about the knowledge and skills gap of the merchant ship officers, based on the qualitative interview data, were analytically presented. The accounts shed light on how the stakeholders became aware of such a gap and their perceptions of why it existed. The data also revealed the interviewees' perceptions of the nature of the gap as well as the wider issues of the limitations of the maritime education and training system. Moreover, different interviewees made distinctions between the theoretical and practical training of the merchant officers. Additionally, the trainers' views on the latest changes to the STCW Convention and their accounts of how effective they thought these changes could be in bridging the knowledge and skills gap of the seafarers were described. The findings revealed that while there is a perceived knowledge gap, there is a more salient gap in the practical training and skills of the officers and the issue of converting knowledge into practice - the so-called 'knowing-doing gap' (Pfeffer and Sutton 2000).

In the following discussion, I have used the established distinction between 'knowing' and 'doing' concepts of training. To do this, the competency gap of the merchant ship officers, as the main research focus, is divided into the 'theory' or 'knowing' gap and the 'practice' or 'doing' gap. Although 'knowing' and 'doing' have distinct definitions, in practice they are, in most cases, complementary to each other. While 'doing', we not only convert our knowledge into practice but at the same time, we gain new knowledge through the practice (Kolb's Experiential Learning Theory; see 3.2.1).

In this chapter, the main findings of the research are examined. For this purpose, I have considered the aims of the research and incorporated the experiential learning theory and the knowing-doing perception of education and training (see 3.2) as a basis on which to frame the discussion about the underlying reasons for the knowledge and skills gap of the merchant ship officers. Furthermore, the discussion is extended to shed light on the shortcomings of the contemporary MET system and the STCW Convention provisions.

It is necessary to restate that the industry's expectation is to have 'competent' officers and to recall Guthrie's (2009) comment that being 'competent' is far more than just having 'knowledge' and 'skill' (see 2.7.5). Department of Education, Employment and Workplace

Relations (2007), cited in Guthrie (2009, p. 18), states that, “Competency requires the ability to apply relevant skills, knowledge *and attitudes* [my italics] consistently over time, and in the required workplace situations and environments.” Therefore, this chapter will examine not only knowledge and skills but also, where applicable, the social aspects of the officers’ training that help to develop the appropriate attitudes.

The chapter comprises three main sections. In the first section, the ‘knowing’ concept of the perceived gap in the merchant officers’ education is discussed. In the second section, the discussion is extended to the ‘doing’ concept of the officers’ training and their competency in performing their shipboard assigned duties. These two sections comprise the essence of the interviewees’ accounts on the knowing-doing gap of the merchant ship officers, their implications and the underlying reasons for the deficiencies in the officers’ competence. The third section considers the measures taken by the stakeholders to address the perceived gap. The chapter concludes with a summary of the analysis based on the findings of the research.

## **8.2 How Prominent is the Officers’ Competency Gap?**

The main concern of this research, as described in the introductory chapter, is to examine the competency of the merchant ship officers and to investigate whether, under the contemporary training system, they gain adequate knowledge and skills to be considered ‘fit for purpose’. It is essential that the industry defines what merchant ship officers in different ranks need to ‘know’ and ‘do’ in order to be considered ‘fit for purpose’. However, this has been a controversial issue. To reach a closer match between the type and extent of the knowing and doing requirements of the workforce, circumvent the inconsistency in the training provided to the seafarers and harmonise the training of the global shipping labour force, the STCW Convention was introduced and it was supposed to be a way of overcoming this issue.

At the outset of this thesis, I explained that the literature suggests that despite the implementation of the STCW Convention over the last four decades, many ship owners and ship operators, as well as the other stakeholders of the industry, perceive a gap between the competences required to fulfil the job and those developed through STCW-based training. In order to examine the validity and significance of the allegation, the interviewees were asked what informs their perceptions concerning the gap between the education and training being provided to the officers and the actual competence the officers require to perform their ship-

board assigned duties. Each group of interviewees cite a range of sources from which they build up their perceptions. The research data suggest that all three groups of interviewees recognise the ‘knowing-doing’ gap in the officers’ training, although there are similarities and differences in their perceptions.

Ship owners and ship operators draw on various kinds of objective evidence such as the analysis of their companies’ revenue and expenses, accident and incident reports and a range of internal and external inspections, appraisals and audits that inform their perception of the officers’ competency gap (see 5.2). They point to the resulting costs of ‘human error’ and the failings of the existing training system. Whether the STCW Convention and the MET system would be able to alleviate some of these concerns is discussed further in this chapter.

The data show that the merchant ship officers’ responses to this question could be divided into two categories. Some of the accounts are based on the officers’ personal experiences and the gap they perceive in their own training; these are the first-hand accounts and they provide live evidence for their claims about the competency gap (see 6.2.1). The other accounts from officers are based on observations made either on board ship with their fellow seafarers (6.2.2) or from interaction with officers from other ships and the sporadic information they receive from the industry.

In their accounts, the officers with a long period of working experience at sea mostly advocate the traditional apprenticeship model of training which they themselves experienced. They compare it favourably with the shortcomings they observe in the training of the new generation of officers under new training requirements. They mostly characterise a considerable population of the new graduates and the present officers as being of low quality and lacking competence. However, the officers with relatively shorter working experience (those whose training is based on the STCW 95 Convention and later requirements) attribute their own skills gap and that of the other officers to shortcomings in the current MET system.

These accounts reveal that, as well as being aware of the knowledge and skills gap of their peers, the ship officers are also self-critical. They put emphasis on the stress they have experienced due to the competency gap they encountered either after boarding their first ship as an officer or in other cases, after their promotion to higher rank. Additionally, the officer interviewees elaborate on their experiences of working on board ships with different groups of



people from different countries, who have graduated from diverse MET systems with noticeable variations in the quality of their knowledge, skills and competence (see section 6.2).

In common with the ship owners and the officers, the trainers perceive the competency gap among the merchant ship officers and produce their own objective evidence. What informs their perceptions is more comprehensive than the responses of the employers and officers. The trainers' evidence includes their own internal observations within the MET system as well as the feedback they receive from external sources such as ship owners and officers (see 7.2.1 to 7.2.6). Their internal sources include the information compiled within the training institutes' quality control systems, course evaluation feedback, lecturers' experiences in the classrooms and examination results. They all show in one way or another that the trainees' knowledge and skills gap is, to a large extent, identifiable by the completion of the training courses, within the training institutes, and even before the officers are tested in the real workplace. The trainers' external information is mainly received from the different stakeholders of the industry.

The lecturers claim that the assessment results reveal signs of a knowledge and skills gap in the officer cadets. Moreover, the instructors' observations on the pre-course knowledge and skills of some of the officers who attend the training institutes for their second CoC indicate that they have experienced a training gap even in their previous training cycle (see 7.2.3). This presents the problem of training them in advanced courses while they show incompetence in the prerequisites for the training courses.

The shipping companies' approaches to the training institutes asking for either modifications to the training courses or extra training requirements (see 7.2.5) as well as the maritime administrations' audit reports (see 7.2.4) are other sources of information which inform the trainers' perception either directly about the competency gap of the officers or indirectly about the nonconformities within their system which result in such gaps.

Through the range of evidence produced by the interviewees, the study data reveal that the knowing-doing gap is widely acknowledged by employers, officers and trainers. Such widespread recognition across all stakeholder groups indicates that the competency gap of the officers is a prominent issue within the industry that needs a comprehensive investigation.

I will now move on to examine the nature and extent of the gaps, as perceived by different stakeholders. I will also try to uncover the underlying reasons for the gaps, look at the priorities of each group and the way these are being addressed by the industry.

## 8.3 The Nature of the Perceived Gap

Implicit in the successful performance of any job is the need for the person carrying out that job to have adequate knowledge, skills and ability in that activity. As explained in chapters two and three, being ‘knowledgeable’ and ‘skilful’ in an activity or a job does not necessarily assure ‘competence’. As well as having appropriate knowledge and skills, a person also needs to have the ‘ability’ to apply these qualities in a social setting and in a real time practice (see 2.7.5). Bleakly (2002) and Doran (2007) consider competency as obtaining knowledge and skills as well as developing professional identity, confidence and motivation (see 3.2.2). These are the key themes that emerged in the course of this research. They are examined in relation to the shipboard workforce in general and the merchant ship officers in particular in this study.

In this section, the nature of the perceived gaps, as understood by the stakeholders, is discussed. First, I will elaborate on the ‘knowing’ gap of the ship officers’ education and training and discuss the adequacy of the STCW Convention prescribed ‘knowledge’ for the officer cadets and the officers of the merchant ships in this respect. This will be followed by the discussion about the ‘doing’ gap of the ship officers.

### 8.3.1 Knowing Gap

“He who loves practice without theory is like the sailor who boards ship without a rudder and compass and never knows where he may cast” (Leonardo da Vinci 1425 - 1519).<sup>59</sup>

Although much attention will later be paid to the ‘doing’ or ‘practical skills’ gap, the value of theoretical knowledge should not be underestimated, as the above quote suggests. One of the significant findings of this thesis is the discrepancy in the ship owners’ and the officers’ perceptions of the knowledge that is required for an officer to be considered as ‘fit for purpose’ (5.3.5). The ship owners perceive a shortage in the type and the extent of the ‘knowledge’ of the merchant ship officers in performing their assigned duties on board ships. From their point of view, the knowledge gap of the officers is primarily related to their ‘commercial activities knowledge’ and their ability to understand and perform the commercial aspects of the ships’

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<sup>59</sup> Cited in Neukrug, E.S. (2016, p. 73).

operations. Although they also refer to the insufficient technical knowledge of the ship officers (5.3.1), their main emphasis remains on the business awareness gap of the officers.

According to the ship owners' interviews, they incur considerable financial losses due to the lack of adequate commercial knowledge (business awareness) of the officers and put the blame on the STCW Convention requirements as well as on the quality of the education being provided by the training institutes. They claim that the Convention's provisions are not sufficient to fulfil the primary aim of the shipping operation, which is commercial activity, and there is a gap in the prevailing training system in providing necessary knowledge to the ship officers to fulfil the actual commercial operational needs of the ships<sup>60</sup>. From their point of view, the shipping operations need to be lucrative and most of the present certified officers are not competent in fulfilling their needs. This issue adversely affects the primary commercial objective of the companies.

However, the research data suggest that officers' perceptions about their knowledge gap and the type of the knowledge they prioritise as being of primary concern is different from that of the ship owners. They claim that their prime concern is about their knowledge gap in safety-related issues, ie the knowledge that could enhance their competence in the safe handling of ships and not in commercial operations.

### **8.3.1.1 Policy Issues, Priorities and Discrepancies in Perceptions**

The research data also show that, on occasions, employers do advocate the positive aspects of the STCW Convention, in its aim of standardising the education and training of the seafarers on a global scale, but they claim that neither the current STCW Convention requirements, nor the MET system, are adequately addressing the gaps in essential knowledge of the officer cadets and the officers. They state that many decades after the introduction of the STCW Convention to the industry, the MET system is still not uniformly implementing the provisions of the Convention and this is one of the main reasons why the outcome of the training of the officers in different training institutes is of variable quality. They also partially attribute the

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<sup>60</sup> The interview data for this issue belongs to the first stage data collection, when the STCW 2010 had not yet been introduced. However, since the new Convention requirements do not address the commercial activities training of the officers, the information received from the ship owners with regard to their perceived gap in this area remains unchanged and still valid.

officers' technical knowledge gap to the inadequate implementation of the STCW Convention requirements by the training institutes.

It is stated in the STCW Convention's introduction that its main aims are to promote safety of life and property at sea and the protection of the marine environment (IMO 2016). Moreover, the STCW Convention provisions are the *minimum requirements* for the education and training of the seafarers to achieve these goals. The Convention contains a generic set of training requirements and they are not principally aimed at addressing the commercial activities of the ships' operations.

On the one hand, while the research data show that the employers are mostly aware of the STCW Convention's current mandate, they still insist that it should prescribe a wider range of training requirements for the officers and encompass commercial activities as well. On the other hand, the officers allege that the shipping companies, in order to reduce the training period and costs, try to influence the maritime administrations to stick to the minimum requirements that subsequently reduce the duration of the training courses (see 6.4.1). Trainers' interviews also show that shipping companies are keen to stick to minimum training in order to keep their expenses low (see 7.2.1). It appears that there is a contradiction in what the ship owners expect from the STCW Convention, wanting it to encompass a wider range of curricula, while being prepared to only pay for minimum requirements.

Most of the training institutes' interviewees state that the maritime administrations of their countries primarily require them to fulfil the STCW Convention provisions. So, should the ship owners have specific training requirements for their officers, they would need to invest in and provide extra training. This could be achieved by providing tailor-made courses that the maritime training institutes could offer. In interviews with trainers, they criticise ship owners because they are perceived to hold unrealistic expectations of the training the seafarers are receiving, based on the STCW Conventions. It is perceived that the ship owners expect the Convention to provide them with 'plug and play' labour. Unlike the ship owners, the trainers are sceptical about the inclusion of 'commercial activities knowledge' in the STCW Convention. They perceive that if the objectives of the Convention include the commercial activities of shipping operations, there could be a conflict of interests between safety and profitability, as the former is costly but the latter involves minimising expenses (see 7.3.4).

Having said that, the interview data suggest that there is another aspect to this issue that is attributed to the reduction of employers' participation and investment in the officers' training. The inclusion of more subjects in the STCW Convention curricula, which the employers are advocating, puts a large percentage of the self-sponsored<sup>61</sup> officer cadets and officers in a disadvantaged situation by incurring additional training expenses. This may further result in an increased number of under-resourced and cheap training institutes as trainees look for low-cost training courses (see 6.4.3 and 6.4.4).

As mentioned earlier, while the ship owners' primary concern is the gap in the officers' knowledge regarding commercial activities, the officers themselves are primarily concerned with their lack of knowledge concerning safety-related issues. This is not to claim that the officers do not show interest in the commercial activities of the ships (see 6.3.5) but they do not give it the first priority. They perceive that the technical and safety-related knowledge they receive is either insufficient or inadequate. They attribute this to a range of underlying issues, including training policies and the STCW provisions, implementation of the policies, training institutes' resources and training expenses.

The issue of the officers' perception regarding the knowledge requirements of the STCW Convention provisions was widely discussed in Chapter Six. Officers perceive that after many revisions to the Convention, there is still a considerable amount of so-called 'old' and 'outdated' knowledge (see 6.3.1) that is no longer in practice. Instead of spending training time on those topics, more updated and useful knowledge, especially regarding new technologies and equipment on board the new generations of ships, should be provided to the officers and the STCW Convention needs to have a dynamic and timely mechanism to update the provisions.

Since the introduction of the STCW Convention in 1978, the Convention has undergone two major revisions in 1995 and 2010. It can be noticed from the revision dates that the period between the revisions is very long. It is claimed by the stakeholders that with the rapid advancement of technology, the regulators are not taking timely action to revise the STCW Convention in response to the changes to the training requirements of the seafarers (see 7.3.1).

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<sup>61</sup> Officer cadets and officers who are not sponsored by any stakeholder, especially the ship owners, and personally pay for their training expenses are referred to as 'self-sponsored' trainees.

A prominent example is the education and training requirements of the electro-technical officers who have been serving on board ships for almost two decades. Their training requirements were not addressed until recently during the Manila 2010 conference. The STCW 2010 Convention, under Regulation III/6 is now addressing these training requirements. Although a reduction in the length of time between successive revisions of the Convention was addressed during the 2010 Manila conference, the implementation and effectiveness of this decision needs to be ascertained in the future.

### **8.3.1.2 Policy Implementation and Variance in MET**

The research data suggest that the informants are concerned about the improper implementation of the Conventions' provisions within the MET system that has resulted in variance in the content and quality of the training being provided<sup>62</sup>. They distinguish between the training providers and perceive that gaps are more conspicuous in officers who have graduated from specific countries, mostly within the newly-emerged labour-supplying countries. They draw upon a range of reasons including the variation in the socio-economic settings of the global labour supplying countries, the difference in maritime training centres' resources and the diminishing role of the employers in supporting the education and training of the officers.

While the employers and officers claim that the knowledge being provided to the officers in different MET systems is not consistent and there is still a potential for different interpretations of the Convention provisions<sup>63</sup>, the trainers' also recognise the variance in the education being provided to the officers among the training institutes (see 7.2.2 and 7.3.4). The surveillance of the maritime administrations, as the governing bodies that can help to alleviate the discrepancies in the training curricula through audits, is regarded as 'inefficient' by the educators. (see 7.2.4).

The employees attribute the knowledge gaps of the officers to a variety of underlying reasons. These include the shortcomings in the training centres' facilities, outdated curricula, the trainers' knowledge gap in relation to the new technology and equipment as well as the diversity and range of the knowledge the officers should obtain within a short period of time.

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<sup>62</sup> See 5.3.1, 6.4.2, 7.2.2 and 7.2.4

<sup>63</sup> See 5.3.1 and 6.4.2 and 6.4.3

While they recognise that there are ‘good quality’ colleges in the industry which can usefully bridge the perceived knowledge gap, they perceive that for those who are self-sponsored and do not receive employer’s support, it is challenging to afford the good quality, but expensive, training (see 6.4.3 and 6.4.4).

The MET system does provide cutting-edge training to the officers but that is expensive (McConville 1999; Sampson 2004; Cicek and Er 2008; Magramo and Gellada 2013). This issue is well recognised by the industry (EASME 2016) and it is expensive for the individuals to invest in such training. There are limited scholarships that are granted, mostly by the ship owners, to the potential workforce<sup>64</sup>. However, not all of those who choose seafaring as their future career are receiving sponsorship support for their training. The self-sponsored officers mostly state that they are obliged to enrol in the less reputable and under-resourced training institutes where they can get the mandatory STCW minimum training at a cheaper cost (see 6.4.3 and 6.4.4). In their interviews, they mention that the duration of the courses in such institutions remains short and the quality of the training they receive is inadequate. Therefore, on completion of the training, they see a knowledge gap in their theoretical understanding as well as inadequacies in their practical training. Nevertheless, they are still able to fulfil the minimum requirements of the STCW Convention and achieve their Certificate of Competency (see Emad 2011).

The officers further claim that the low quality of trainers (see 6.3.1), the large body of theoretical knowledge they need to gain during a relatively short period of time (see 6.4.8), along with a lack of modern training facilities in the training institutes, all contribute to their theoretical knowledge gap. Not all of the knowledge is gained in college through theoretical education, as it is partially gained on board ship. Since most officer cadets are neither sponsored nor supported by shipping companies, they find it extremely difficult to locate a cadet berth for on-board training (see 6.3.2 and 7.3.2). Sometimes they have to board ships and work as ratings in order to fulfil the mandatory seagoing service training and to be eligible for CoC examinations. Therefore, the shipboard officers do not show interest or feel any obligation to provide them with mentoring since they are expected to spend all of their time performing the ratings’ tasks (see 6.3.2). This means that they experience multiple knowledge gaps during both shore and shipboard training. Consequently, after obtaining their CoCs, the officers do

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<sup>64</sup> These are referred to as ‘company-sponsored’ trainees.

not feel competent to safely handle the ship and find life on board very stressful until they eventually gain the required knowledge through an extended period of work experience. This undermines the safety of the ship.

Research data suggest that the quality of the trainers is a significant concern which is highlighted not only by the ship owners and the officers but also by the trainers themselves<sup>65</sup>. The interview data show that most of the training institutes do not have appropriate plans and procedures to adequately update their trainers' knowledge, most of whom left the sea long ago (see 6.4.3). With the rapid advancements in the shipboard technology and machinery, it is evident that many training institutes are not able to cope with the changes. They not only lack resources to upgrade their simulators and workshops, but also their lecturers do not have adequate up-to-date knowledge and experience to teach the trainees<sup>66</sup>. A few decades ago, when cadets were despatched to ships for their shipboard training, the training institutes had the opportunity to send their trainers to the ships to accompany the cadets as their designated shipboard training officers (7.4.5). This would give them the opportunity to mentor the cadets on board ship and at the same time learn and upgrade their own knowledge and experience. With the elimination of the designated shipboard training officers, as another cost reduction strategy of the shipping companies, one of the suitable means by which the trainers could keep up-to-date has been withdrawn (see below). Therefore, one of the findings of this study suggests that despite some of the training institutes taking sporadic action to send their trainers on specialised training courses, the rest of the trainers remain untrained in the changes to the shipboard operations and the related knowledge and skills. Not much can reasonably be expected from the outcome of the education and training of the officer cadets and cadets unless either the STCW Convention or the administrations take adequate measures to provide compulsory upgrading education and training for the trainers. A course for the maritime college instructors entitled 'training for trainers' does exist, but it has nothing to do with upgrading the trainers' technical knowledge. This very short course contains only the basics of the pedagogy and teaching techniques and does not aim to address the range of issues identified in this study.

The documentary analysis I carried out on the STCW Convention provisions as well as on the sample training institute course contents and curricula is, to some extent, consistent with the

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<sup>65</sup> See 5.3.1, 5.4.5, 6.3.1, 7.3.1 and 7.3.2

<sup>66</sup> See 5.3.1, 5.3.2, 5.4.5, 6.3.2, 6.4.3 and 7.3.2



interviewees' perceptions concerning the shortcomings of the STCW Convention provisions as well as the variances in the curricula across the training institutes. The IMO has developed many model courses, which contain main course curricula. The intention of this is to avoid variations in interpretations of the STCW Convention provisions and consequently facilitate the standardisation of the training institutes' curricula (see IMO 2011, Resolution 9). My observation shows that the training institutes, although claiming to use the IMO model courses in developing their own courses, end up having very different sets of curricula. Research data also show that there are differences not only in the subjects being taught in the courses but also in the number of teaching hours, training facilities and media being used in the classrooms as well as the qualification of the instructors and the standard of assessment procedures<sup>67</sup>. The industry is aware of this major problem and during the STCW 2010 revision it was decided that a comprehensive revision of the IMO model courses was necessary. Moreover, it was suggested that it would be necessary for the training institutes to revise their course contents and curricula and the maritime administrations of the countries should play a more active role in harmonising the MET systems and regulating the competency examinations to make them more efficient tools for assessing the seafarers' knowledge and competence.

In accord with the findings of the qualitative research carried out by Emad (2011) regarding adult and vocational education in the maritime domain, my research data suggest that the current assessment procedures do not adequately measure the knowledge and competency of the trainees<sup>68</sup>. As Emad states, "The assessment system had changed the objectives of the education and training practices from developing knowledge and skills required at work into learning how to pass the certification examination" (Emad 2011, p. 47).

In addition to Emad's observations, my data from trainers' interviews suggest that they have concerns about the assessment of competence of the trainees (see 7.2.2). Some of the administrations accredit the training institutes to conduct part of the CoC examinations. As it can be seen in the interview excerpts presented in the data chapters, some trainers alleged that in order to increase the success rate of the trainees (and hence build up a better reputation of the training institute and attract more customers), the under-resourced training institutes have unwritten policies to set 'easy exam papers' which undermine the quality of the training and

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<sup>67</sup> See 5.3.1 and 6.4.2, 6.4.3, 7.2.2, 7.2.4 and 7.3.4

<sup>68</sup> See 5.3.1, 5.3.2, 6.3.2, 7.2.2, 7.2.3 and 7.3.1

assessments. It means that the trainees are less concerned with gaining the comprehensive knowledge they need to perform their jobs than with preparing themselves to get the ‘pass-mark’ (see 7.3.1 and Emad 2011, p. 47). Also, the assessment does not truly measure whether the candidates have gained the essential knowledge, as set in the objectives of the course. Notwithstanding the shortcomings of the STCW requirements, the current examination and assessment systems are claimed by the trainers to be inconsistent. Some of the trainers even went on to add that they did not consider the current assessment as a reliable tool to measure even the minimum knowledge of the trainees, as prescribed by the Convention (see 7.2.2).

### **8.3.1.3 Social Knowledge**

Research findings suggest that another significant gap and under-developed area in the education of the seafarers is the social knowledge and understanding that the contemporary labour force needs to overcome the complications of working and living in the multinational workplace on board ships. The STCW Convention response is inadequate, given that it involves a very short classroom-based training course (Personal Safety and Social Responsibility) which, according to the interview data, the officers and trainers consider to be ‘insufficient’ (see 6.3.3 and 7.3.1). The training institutes recognise this shortcoming and have stated that there are comprehensive courses available which can alleviate the knowledge gap of the officers in this area. However, as the extra courses are not mandatory, they are less in demand. Hence, trainers claim that they have not been successful in bridging this gap by devoting extra time to such training. Their reasons range from the unwillingness of the ship owners to extend the duration of the training and cover the costs of the extra social training for their workforce, to the reluctance of self-sponsored officer cadets and officers for whom incurring any extra training expenditure on top of the STCW Convention requirements risks financial hardship. It seems essential for the policy makers to have a better understanding of this important issue that the officers suggest has a direct impact on both the safety of the ships and their efficiency in performing their duties in a multinational team-working setting. The significance of this determinant on the social interaction of the seafarers, team-working and mentoring is widely discussed in the previous chapters and I will return to this issue in later sections.

The officers and trainers perceive that addressing the social, cultural and behavioural training gaps could have a significant effect on the social life of the officers as well as on the interactions within the ‘community of practice’ on board ship. These in turn could improve the social interaction which is one of the significant determinants of knowledge and skills transfer and

peer mentoring on board ships. Interview data shows that the ship owners did not address this issue.

#### **8.3.1.4 Diversity of Ship Types and Equipment and its Implications for the Knowledge Gap**

As mentioned earlier in this chapter, the officers' and trainers' accounts suggest that the variety of marine machinery and equipment being introduced on board ships by different manufacturers makes it very challenging for the MET system to afford appropriate resources to provide a full range of knowledge to the trainees. Moreover, the limited duration of the training courses makes it unfeasible for the trainees to learn about a diversity of equipment. All of these issues combine to cause a gap in this area of the officers' knowledge. However, in order to partially bridge this gap, the officers advocate the idea of a 'segmented labour market' where the officers receive specialised training for specific types of ships or for working with a specific type of equipment (see 6.3.1). This issue needs mutual consideration by the marine-type equipment manufacturers, ship builders and shipping companies to standardise the ships' equipment. This would bridge the current knowledge gap caused by the variety of equipment used to perform identical functions but with different principles and operating procedures.

#### **8.3.1.5 Quality of Intakes and Personal Motivation**

As discussed in previous chapters, the nature of the officers' job demands a wide range of technical, managerial and social knowledge and skills. The quality of the intakes is an influential determinant of training outcomes. The advanced machinery and equipment of modern ships requires trainees to undergo extensive training within a short period of time. To cope with the influx of diverse knowledge they need to be motivated and self-regulated (see 7.4.3).

Research data suggest that in order to bridge the knowledge gap of the officers, the industry needs to attract suitable intakes for seafaring jobs. However, attracting the new workforce has been a challenge within the industry for several decades (Cockroft 2003; BIMCO/ICS 2015).

It is worth mentioning that most of these issues and shortcomings were raised by the officer interviewees regardless of whether their training had been self-sponsored or company-sponsored. The interview data show that the interviewees were not only reflecting on their own personal knowledge gap and its underlying reasons but also their accounts comprised their

reflections on the knowledge gap of officers in general, based on their observations while working with multinational crew from diverse training backgrounds. In common with the officers, the trainers were reflecting on their own training system as well as those of other training institutes.

In the next section, I shall elaborate on the ‘doing’ gap of the ship officers’ training as perceived by the stakeholders and discuss the underlying reasons for such shortcomings.

### **8.3.2 ‘Doing’ Gap (Skills and Competency Gap)**

At the outset of this chapter, I used the established distinction between ‘knowing’ and ‘doing’ (Kolb 1976; Lave and Wenger 1991; Pfeffer and Sutton 2000) to structure the discussion. In the previous subsection the ‘knowing’ requirements and the perceived gap from the employers’, employees’ and trainers’ points of view was discussed. It was explained that although the stakeholders recognise the knowing-doing gap, the different groups perceive the issue of knowledge requirement for the officers differently. In this subsection I shall elaborate on the ‘doing’ element of the ship officers’ training, which comprises the research questions related to the nature of the skills and competency gap of the officers.

The research data suggest that the ‘doing gap’ of the workforce, as perceived by the interviewees, includes the practical ability of the officers to operate machinery and equipment in the workplace and a range of soft skills such as teamwork, communication, leadership, managerial skills and ‘officer-like qualities’<sup>69</sup>. Although all of these skills are associated with both theory and practice, the stakeholders’ concern, especially relating to soft skills, is mainly with the gap in the practical ability of the officers in these areas. With the exception of individuals occasionally working solo with equipment, most of the jobs on board ship involve teamwork and require a whole range of soft skills. The revised STCW Convention has introduced new training provisions for some of the soft skills such as teamwork, leadership and management. However, the informants are mostly sceptical about the extent and effectiveness of the short training courses that are conducted in colleges in compliance with those new training provisions (see 6.3.3 and 7.3.2).

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<sup>69</sup> See 5.3.2, 5.3.3, 5.3.4, 5.3.6, 6.3.2, 6.3.3, 6.3.4, 7.3.2 and 7.3.3

In the literature review chapter, it was explained that in the contemporary MET system, skills are mainly developed through a combination of college-based practical training in workshops and simulators plus practical experience on board ship and in the actual workplace (see 2.7.3). While the Convention holds the training institutions responsible for the college-based training, the ship owners are accountable for facilitation of the practical on-board training of the trainees<sup>70</sup>. The different groups were found to hold differing perceptions with regard to how the competency of the officers in ‘doing’ or ‘practical skills’ can be developed.

The research data suggest that there might be some correlation between the size of the companies and their strategy towards addressing the competency gap of their workforce (see 4.7.1.3). In the interviews, the small-sized companies, and quite a number of medium-sized ones, did not show much interest in discussing the deficiencies of the on-board practical training. Only a few owners’ representatives who had a seafaring background briefly raised the subject. While this is not conclusive evidence of a strong correlation between sizes of companies and their commitment towards the training of their workforce (due to the small size of the data sample), the findings of this research show that the size and resources of the companies could be influential factors in the extent to which they address the skills gap of their workforce. The research findings further suggest that the contribution of the shipping companies to the MET in general, and facilitation of the practical on-board training in particular, has mostly been contested and criticised by the officers and trainers. The interviews with the maritime organisations (see Appendix 2d), further indicate that most of them are concerned whether the ship owners are taking proper action in providing the training facilities as required by the Convention.

In contrast to the ship owners, who mostly attribute deficiencies in the competency of the officers to the college-based training, the officers and the trainers highlight the substantial gap in the on-the-job training which they see as undermining the training system. However, the officers have important criticisms about the college-based training as well. Moreover, the adequacy of the STCW Convention provisions for the trainees’ skills development is found to

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<sup>70</sup> This is a controversial issue since the provisions of the Convention in addressing the ship owners for facilitation of the on-board training are ‘recommendatory’ rather than ‘obligatory’ (see STCW 2011, Regulation I/14, p.32 & Resolution 13, p.57).

be questionable by the all three groups of interviewees. These issues are further discussed later in this section.

In presenting the findings, a number of themes are identified as relevant to the different perspectives. The themes that are discussed in this section and the underlying reasons for the gaps in those areas are mostly rooted in the twin effects of globalisation of the industry and the transformation of shipboard practices as the result of the technological advancement of the ships. These include the competitiveness of the sector, international crewing strategies and work intensification, cost reduction incentives by adoption of the flagging out strategies and deregulation of the industry. These have all affected the working lives of the seafarers, and consequently undermined the quality of on-board training.

### **8.3.2.1 Significance of 'Practice' On Board Ship**

The seafaring profession is predominantly a practical activity in which the practitioners' occupational knowledge and skills are fostered under a vocational education and training system. Along with theoretical education, trainees develop their practical and technical skills and learn how to work with a range of machinery and equipment. Hence, the profession requires the trainees to obtain appropriate knowledge through theoretical education and put that knowledge into practice through skills development training. The apprenticeship model of learning on board ships was considered as the dominant means by which seafarers developed their skills in past decades (Hutchins 1995; Kennerly 2002). It still underpins the current system, although in the contemporary MET system, shipboard practices are, in part, replaced by college-based simulators and workshop exercises.

The research findings show that the ship owners, officers and trainers recognise the importance of both theoretical and practical education and training, their relationship and implications. The trainers advocate using simulators and workshops ashore as well as on-board training for the skills development of trainees. However, the officers, while not completely denying the effect of simulators and workshops in developing their skills, mostly advocate on-board training as the best setting for practical training. This is where they can put their theories into practice and develop their competence.

As explained in the literature chapter, the relationship between theory and its practical applications has been at the top of the education and training agenda for several decades (see 3.2). Many scholars have researched and developed teaching and learning theories and models

which include experiential learning (eg. Dewey and Kolb), situated learning (e.g. Brown, Collins and Duguid), knowing by doing (eg. Pfeffer and Sutton), cognitive apprenticeship (eg. Collins, Brown, and Newman), and communities of practice (eg. Lave and Wenger).

Conventionally, training courses are characterised as either practical or theoretical: as either involving doing or involving thinking (Neary 2000). Learning is seen to take place either ‘on the job’ or in the classroom. Even in courses that contain both theoretical and practical elements, they tend to be sharply divided. An academic teacher normally delivers theory in the classroom whilst a skills trainer provides practical experience in a simulator or workshop. Neary suggests that it is also common for both types of course to have limited success.

Furthermore, Neary (2000, p. 102) states that, “It is not sufficient simply to have an experience in order to learn.” Without reflecting upon this experience, it may quickly be forgotten or its learning potential lost. It is from the feelings and thoughts emerging from this reflection that generalisations or concepts can be generated and it is the generalisation that enables new situations to be tackled effectively. Similarly, if it is intended that behaviour should be changed by learning, it is not sufficient simply to learn new concepts and develop new generalisations. This learning must be tested out in new situations. The learner must make the link between theory and action by planning for that action, carrying it out, and then reflecting upon it, relating what happens back to the theory (Neary 2000, p.100).

Likewise, Gibbs (1988, p. 9) states that, "It is not enough just to do, and neither is it enough just to think. Nor is it enough simply to do and think. Learning from experience must involve linking the doing and the thinking." This can be achieved by giving the opportunity to the trainees to have appropriate time to practice under the supervision of experts in a real workplace. My research findings correspond with the experiential learning theory where the officers highlight the significance of on-board training, asking to be given adequate time and opportunity to convert their knowledge into practice in the real workplace, to reflect upon this and repeat the experience until their skills are validated by the experts as sufficient to perform independently.

Research findings from the industry show that the duration of practical training opportunities on board ship and within the ‘community of practice’ has significantly reduced compared to four decades ago and access to on-board training for the officer cadets has declined. This has been partially replaced by using simulators and workshops in colleges. The contemporary

issues with the ‘community of practice’ (see 3.2.3) on board ships, its coincidence with the significant reduction of the on-board training prescribed by the new regulations and their implications for the skills development of the officer cadets and officers are discussed further in this chapter.

There is a rich body of literature on deploying simulators for training purposes in different industries, which includes their advantages and limitations. The intention of this research is not to examine the simulator-based training in the shipping industry but it is necessary to provide a brief context, applicable to this research. According to Resnick (1989), the process of completing a task in a technical industry may take days to complete and this prevents apprentices observing the whole process during short work placements (see 3.2.4). It is also possible that some tasks may not occur at all during the work placement. In these situations, the trainee may not get the opportunity to experience certain essential tasks during the apprenticeship. This is very likely in the case of shipping operations since many situations, especially those relating to emergencies which are a very important part of the training curricula, may not occur while the apprentice is carrying out sea-phase training. Safety issues and cost implications may also prevent trainees’ access to complex and expensive machinery to learn through trial and error. These limitations are not only applicable to the skills development of the apprentices but also the officers who may not encounter many essential operational situations during their training and even during their service in the real workplace. In these situations using simulators and workshops, where different scenarios could be generated for training purposes, could be advantageous.

However, there is scepticism about the replacement of training in the actual workplace with simulator-based training. Lave and Wenger (1991, p. 53) claim that learning involves construction of identity. For the shipboard workforce to construct their identities, they need to become involved in actual shipboard operations (National Research Council 1996; Safahani 2009). Hummel (1993) claims that simulators do not provide ‘authentic work situations’ (see 3.2.2). Research data suggests that most of the ships’ officers advocate shipboard training as the most appropriate means of practical training, since it allows them to experience what it is to be an officer in the context of an authentic workplace where they can develop both the technical and soft skills (teamwork, management, etc) required for the role. Research into the development of soft skills in other fields, such as medicine and engineering, also shows that a



variety of soft skills are more likely to be developed through practical training (Washor 2015; Vaughan 2017).

### **8.3.2.2 Apprenticeship within the ‘Community of Practice’**

Scholars have addressed the issue of “why knowledge of what needs to be done frequently fails to result in action or behaviour consistent with that knowledge” (Pfeffer and Sutton 2000, p.4). In order to overcome this failure, the value of the apprenticeship model of learning and experience in the workplace has long been advocated by experts within the industries (Billett 2010). It supports learning skills in the social and practical context and it is primarily based on the apprentice’s observation of professionals’ performance throughout the working processes (Lave 1991). In this learning model, novices, under the supervision of skilful practitioners, participate in the practice (Lave and Wenger 1991). This is how the apprentice progressively observes, participates and develops knowledge, skills, and competencies. It resembles the training and workforce development model that has been used in the shipping industry for decades. Traditionally, apprenticeship was the most common means of developing competencies for work (e.g. Hutchins 1995).

While researching apprenticeship as a learning model, Etienne Wenger and Jean Lave observed that learning was taking place through the exchange of information and experience by members of groups formed by people who shared a common occupation or interest. They termed these groups ‘Communities of Practice’ (Wenger 1999; 2011) and identified three elements which were necessary for their existence: ‘the domain’ (the field of interest shared by members of the group), ‘the community’ (interaction between members) and ‘the practice’ (the competencies that are shared and improved upon through the interactions of the group). This subject was explained in detail in Chapter Three (see 3.2.3).

My data shows that the ships’ officers and most of the trainers claim that giving the trainees access to the ships’ ‘community of practice’ is one of the most effective means of achieving the training objectives. However, the research findings also shows that ‘the community’ as one of the main elements of the community of practice, on board ships is noticeably fractured and

has declined, which is undermining the practical training<sup>71</sup>. This issue is discussed later in this section.

### **8.3.2.3 Introduction of New Technology and Transformation of On-Board Practices**

Workplaces have undergone rapid changes during the last few decades. Likewise, the shipping operations and practices have evolved rapidly, changing the nature of the tasks assigned to the officers (see 2.4). These changes are mostly attributed to the introduction of new technologies, including electronics, automation and information technology (IT). As a consequence, the interview data and the documentary analysis show that the required skills and the way work on board ships is performed have changed, and what constitutes a ‘ship’s officer’ is different now compared with how it was perceived four decades ago<sup>72</sup>.

Prominent examples of the new technologies are the introduction of sophisticated radars, Electronic Chart Display and Information Systems (ECDIS), Automatic Information System (AIS), satellite and electronic navigation aids, unmanned machinery spaces and controls, computerised bridge and engine room control systems, computerised loading systems, etc. where the practitioner’s job description and consequently the skills required to perform their assigned duties have been transformed. Moreover, the changes in the on-board maintenance strategies of the shipping companies have resulted in the transformation of the job descriptions of the seafarers which in turn require a different type and level of skills.

In order that the officer trainees and officers can get acquainted with the diversity of the machinery and equipment, they need to be given proper opportunity not only to gain necessary knowledge about the modern technology<sup>73</sup> but also to develop their skills and competence through practical training<sup>74</sup>. What has been observed in the course of this research suggests that all stakeholders recognise the transformation of the workplace practices as a result of technological advancements. They also admit that these changes demand concomitant changes in the nature, extent and type of knowledge and skills the officers need in order to perform their

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<sup>71</sup> See 6.4.5, 6.4.6, 7.3.2 and 7.3.3

<sup>72</sup> See 2.3, 2.4 and 2.6

<sup>73</sup> See 5.3.1, 6.3.1 and 7.3.1

<sup>74</sup> See 5.3.2, 6.3.2 and 7.3.2

assigned duties. However, the means of addressing the changes within the policies and the participation of concerned stakeholders in tackling the emerging needs is a contentious issue.

Officers perceive that the new technology and diverse types of ships and equipment require not only a wide-range of theoretical knowledge (see 6.3.1) but also practical skills (see 6.4.2 and 6.4.7). The trainers also elaborate on this issue. However, providing all necessary knowledge and skills to trainees during a limited period of time and limited hardware and software resources in colleges and on board ship remains a challenge. As mentioned earlier in this chapter, some of the interviewees advocated the idea of a ‘segmented labour market’ as a solution to alleviate the skills gaps.

#### **8.3.2.4 Shortcomings of the ‘Traditional Apprenticeship’ Model of Training**

Historically, seafarers’ training was carried out on board ship and both ‘knowing’ and ‘doing’ were developed through a traditional apprenticeship model of learning where the apprentice could ‘observe’ the experts performing tasks. The new technologies and equipment not only caused significant changes to the nature of the work but also affected the process of workplace learning. One of the major changes to the feature of the learning was due to the effects of the new technology on performing the tasks. Many aspects of the job performances became less visible and even hidden by the new technologies (Bakker et al. 2006; Emad 2011). Examples include working with computerised systems and controls where the work performance is mainly through the mind process of the practitioner rather than being ‘physically visible’. Emad (2011, p.122) states that:

the work procedures and the mental processes of operators while working with the sophisticated instruments tend to be invisible for newcomers. Consequently, new technical work environments provide limited resources for the apprentices to observe and understand practice and thus hinder the development of the required competencies.

According to Resnick (1989), in highly technical jobs, neither the technical processes nor the thought processes of the ‘experts’ are visible. Therefore, it is no longer the case that the apprentice can gain skills only by observation (see 3.2.4). Rather, there are many occasions, such as learning how to work with ships radar, when there needs to be more verbal and explanatory interaction between the mentor and the mentee within the ‘community of practice’. The traditional apprenticeship model of learning appears to be less effective and the notion of

the ‘cognitive apprenticeship’ in the workplace and the importance of the training institutions’ role in preparing the apprentices for on-the-job training have become more relevant (see 3.2.4 and 3.2.5).

One of the results of a study carried out on implementation of the cognitive apprenticeship model of training by Stalmeijer et al. (2009) in a medical domain suggests the failure of the model, among other factors, could be attributed to teachers allocating ‘insufficient time’ and ‘lack of teaching skills’(see 3.2.5). These two factors will be examined further in this chapter to verify whether in the maritime domain and under the current circumstances, the officers who are expected at some point to play the role of ‘teacher’ or ‘mentor’ on board ship possess these two elements.

The changes to workplace learning necessitate the inclusion of enhanced cognitive and interactive mechanisms in skills development training. Establishing a vibrant ‘community of practice’ on board ship as well as interactive and enhanced practical training on simulators and workshops could be among the key elements needed to meet these training objectives. However, the results of the research show that changes to the industry during the past few decades and the ship owners’ increasingly economic-driven motives (see Chapter Two) have adversely affected the effective ‘communities of practice’ that previously existed on board ships<sup>75</sup>. This is one of the determinants that consequently resulted in the decline in the quality of the shipboard training.

### **8.3.2.5 Effects of Globalisation and Technological Advancements on the MET On Board**

The importance of the ‘human element’ in the shipping industry, especially the seafaring labour force, is underlined in previous chapters. It was argued that many and perhaps most of the issues relating to the education and training of the seafarers have their origins in the twin processes of flagging out (Lane 2000; Kahveci and Nichols 2006) and the technological advancements of ships and equipment (see Chapter Two). When, ship owners moved into open registry in order to stay competitive, it resulted in the reduction of crew complements, the deployment of multinational crews and the disinclination of the ship owners to invest in the labour force’s education and training. The ship owners took advantage of the lax regulations

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<sup>75</sup> See 6.3.2, 6.4.5 and 6.4.6

with regard to all aspects of labour, work and employment of the new flag states and deployed seafarers from newly emerged labour supply nations with less developed MET systems compared to those of the TMNs.

At the same time, technological advancements in the ships' equipment meant that ships could be operated by a smaller workforce (see 2.4). The crew complement of about 40 (Couper, 2000) was halved to about 20 and even fewer (Sweeney, 2014) through the flagging out process.

As a further measure to save cost, ship owners largely withdrew from recruiting and sponsoring cadet officers and investing in their training. With crews being both multinational and reduced in number, there arose new problems such as communication issues, less social interaction and fatigue (Smith 2007). All of these elements were examined during the interviews and the research data indicates that they have a substantial impact on shipboard training and undermine the skills development process, subsequently contributing to the competency gap of the officers. These determinants are discussed below.

#### **8.3.2.5.1 Reducing Costs Incentives and their Effects on MET**

In shipping operations, one of the main expenses in the running costs of a ship is the crew's wages (Greiner 2015; 2016; Wilson 2016). However, deploying cheap labour from emerging labour supply countries was not the only cost-saving measure taken as a result of the reformed regulations. By having access to trained and certificated cheaper labour in the global labour market, the ship owners were less interested in investing in the education and training of the seafarers, which is considered to be expensive.

The research findings reveal that under the present regulatory regimes the ship owners are not adequately cooperating in sponsoring the shipboard training. Despite the STCW Convention reiterating the need for the ship owners' cooperation in providing appropriate berths to accommodate the trainees (IMO 2011, Resolution 13), providing procedures for on-board training and sponsoring the trainees, the findings do not suggest any improvements have taken place. The documentary analysis of the shipping companies' procedures indicates that many of them do not have appropriate training procedures and instructions for on-board training and the officers are not accountable for mentoring the apprentices and fellow officers. The officers and trainers perceive that most ship owners do not show any intention of supporting the workforce's training either ashore or on board ships. The research data shows that most of the employers interviewed, particularly those from small shipping companies, do not show interest

in elaborating on the shipboard training gaps and rather attribute the problems to the training institutions' deficiencies<sup>76</sup>.

The officers claim that diminishing training support by the ship owners has caused the trainees to look for the less expensive training courses that are mostly provided by the under-resourced training providers. This in turn has contributed to the knowledge and skills gap of the trainees (see 6.4.4). At the same time, in order to fulfil the in-service and on-the-job training requirements of the Convention for certification, without ship owners' support in providing berths for cadets and incurring on-board training expenses, the trainees have to join ships as ratings. Therefore, most of their time is spent in performing the tasks of ratings and not getting any support from the on-board officers in developing the skills needed for their forthcoming jobs as officers (see 6.3.2). In this process, they not only end up with a knowledge, skills and competency gap but also miss out on the opportunity to build up their 'professional identity' (see 3.2.2 and 3.2.3).

Another repercussion of ship owners' cost reduction incentives is the eradication of the designated training officers on board ships, a role that was once supported by the ship owners. As one of the major findings of this research, the interview data suggests that the elimination of the designated training officers has had a significant impact on the practical training and skills development of the officer cadet trainees under the prevailing on-board training conditions (see 6.3.2). Officers claim that, under the current shipboard practices, it is not feasible for the officers to undertake training responsibilities and mentor the trainees. This is due to several reasons including the fast turn-around of ships, reduced number of crew, job intensification, issues with the multi-nationality of the crew compliment and reduced social interaction. This issue not only affects the officer cadet training but also has an impact on the mentoring role of the senior officers towards their juniors (see 6.3.2). Therefore, officers perceive that elimination of the designated training officers have significantly undermined the success of on-board training.

Trainers have two concerns with the issue of the elimination of the on-board designated training officer. The main concern is the designated training officer's role in training and at the same time monitoring the cadets' activities and progress on board ship. According to the trainers'

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<sup>76</sup> See 5.3.1, 5.3.2 and 5.4.5

statements, the training institutes have surveillance on the education and training of the trainees while they are in the college. However, once they go on board ship for their practical training, they are out of reach and the college no longer has effective monitoring of their on-the-job training. The training curricula for the shipboard practice is presently founded on a ‘training record book’ (in the form of a portfolio comprising a generic set of tasks that trainees should carry out on board) and the quality of the training greatly depends on ‘unreliable’ monitoring and support rendered by the shipboard officers (see 6.3.2 and 7.3.2). Whereas designated training officers had a significant role in mentoring and monitoring the on-board training, by eliminating them from the training system, the outcome of the on-board training remains uncertain and of variable quality.

The secondary concern of the trainers in this regard is that occasionally taking the designated training officer role on board ship gave them the opportunity to upgrade and update their own skills and knowledge of ship-board practices. By eliminating this role on board ship, this opportunity has been removed and the trainers need to look for other options to upgrade their knowledge and skills.

The research findings further suggest that the trainers are concerned about the lack of support from ship owners and other concerned stakeholders which affects their ability to upgrade their hardware and software resources in college. This issue in turn affects the quality of training being provided and consequently contributes to the skills gap of the workforce. Moreover, the interview data suggests that the training institutes have a cost reduction strategy and invest only minimally to remain competitive. Keeping costs low in order to attract a large percentage of self-sponsored trainees is another factor that is exacerbating the situation (see 7.3.1 and 7.4.1). This strategy involves providing the cheapest means of training by deploying poor quality software and hardware, including low quality workshops and simulators. This is resulting in the growth of more under-resourced training institutes which consequently undermine the quality of a large population of the global labour force.

Additionally, both the documentary analysis of the STCW Convention and the research data suggest that the provisions of the Convention do not effectively bind the ship owners to facilitate on-board training for trainees (see IMO 2011, Regulation I/14, p. 32 & Resolution 13, p. 57). According to the interviewees’ statements, the Convention’s requirements which

apply to the ship owners are ‘recommendatory’ rather than being ‘obligatory’<sup>77</sup>. After all the new changes to the Convention, the requirements are still quite lax in relation to the ship-owners. Even where the responsibility of controlling the ship owners’ compliance lies with the maritime administrations (Regulation I/14), apparently under the current regime either the administrations are not concerned or do not have sufficient resources to ensure implementation of the requirements and compliance of the stakeholders<sup>78</sup>.

#### **8.3.2.5.2 Multinational Crew and its Effects on Shipboard Training**

One of the impacts of the global shipping labour market is the introduction of the multinational crew complement on board ships. There is a rich body of literature elaborating on the pros and cons of ‘transnational communities’ in the workplace (eg. Kahveci et al. 2002) and their effect on education and training in different industries (eg. Kristensen 1998). Among the positive features, Kristensen (1998) refers to the transfer of technology and know-how, development of international qualifications (including linguistic skills) and development of transversal skills. It is not intended to scrutinise the ‘transnational communities’ here, but for the purpose of this research, I have briefly examined the effect they have had on the training of officers in the maritime domain. My research findings reveal that the multinational crew has noticeably been disturbing the ‘community of practice’ on board ships. There are a range of underlying reasons which are mostly attributed to the lack of common national and cultural identity, social isolation, lack of common language and communication problems<sup>79</sup>. This undermines the effectiveness of the on-board training, not only of officer cadets but also the skills development of the junior officers preparing for higher ranks. As mentioned in earlier chapters, the new cognitive apprenticeship model of training requires more verbal interaction between the trainer and the trainee, which cannot be provided in the fractured and declining contemporary communities of practice on board ship.

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<sup>77</sup> See 6.2.6, 6.4.4 and 7.3.2

<sup>78</sup> See 7.2.4, 7.31 and for example EMSA report 2014, Dacanay 2015 and Hughes 2017

<sup>79</sup> See 5.3.2, 5.3.4, 6.3.2, 6.4.6, 7.3.2 and 7.3.3



These research findings do not accord with the advantages of the ‘transnational communities’ identified by Kristensen (1998). Further research could be conducted to examine the reasons and extent of this contradictory finding (see 8.3.2.5.2).

#### **8.3.2.5.3 Reduction of Crew, Work Intensification and their Effects on Shipboard Training**

Reduction of the crew size and work intensification have resulted in fatigue and a reduction in the leisure time of shipboard officers (Kahveci and Nichols 2006; Smith 2007). As a consequence, formal communities of practice have been diluted and informal social settings, in which knowledge and experiences could be exchanged, have been weakened. In common with the findings of the previous researchers, my data also suggest that reduction of crew and work intensification have adversely affected the shipboard practical training (see 6.4.5 and 7.3.2).

The lack of a nurturing, supportive culture for knowledge and skills-transfer on board ship is demonstrated by the accounts given in 7.2.3 by trainers. They recount that officers admit to being reluctant to approach and ask questions of their senior officers, for fear that revealing a lack of knowledge of a particular practice may be construed as incompetence. The officers are afraid that such admissions may lead to them being disadvantaged in appraisal evaluations and result in the loss of performance bonuses or even the loss of their jobs. This issue was not reported by the officers themselves but came as a second-hand account via the trainers. A similar situation where “fear of losing job impeded effective communication” was noted among workers by Bhattacharya (2009, p. 265). Such a situation is another reason behind the knowledge and skills gap of the officers.

One of the research findings reveals that minimising the diversity of the nationalities could help to strengthen the community of practice on board ships, as an effective platform for knowledge transfer among the seafarers (see 6.3.2). Nonetheless, the social interaction, which the research suggests to be a necessary and effective factor in both formal and informal on-board training<sup>80</sup>, may still be hindered due to work intensification and the reduced number of crew (see 6.3.2 and 6.4.5). Therefore, unless the concerned parties address the prominent issues of work intensification, fatigue and lack of common language, as the minimum, the social interaction of the seafarers and the effectiveness of learning within the communities of practice

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<sup>80</sup> See 3.2.3, 6.3.3, 6.4.5

will remain a problem. The ship-owners and the maritime administrations can have a significant role in reviving the communities of practice settings by revisiting the manning scale of the ships and avoiding the reduction of the ships' crew complements. Research data indicates that the reasons why appropriate action to alleviate the problem has not been taken is due to the cost reduction strategy of the ship owners (see 2.3 and 2.4) and the lack of resources and, arguably, incentives, of the maritime administrations to properly implement and enforce the relevant regulations (see 7.2.4 and STCW 2011, Resolution 6, p. 53).

The problems associated with workload stress and working for a long time in small multinational communities are issues that are not adequately addressed in the training policies. Consideration could be given to accommodating appropriate training in the curricula of training institutes in order to alleviate the problems. Addressing the social, cultural, linguistic and workload stress issues may, in turn, help to re-establish effective communities of practice on board ships.

#### **8.3.2.6 Practical Training Ashore**

Skills can be developed through the use of simulators and training workshops (see 3.2.2). However, the interviewees' accounts advocate the notion that what builds up the trainees' 'competence' is experience gained in the real workplace (see 3.2.2 and 8.3.2.1). The STCW Convention has provisions for trainees to spend a minimum time on board ship and develop their skills through lived experiences, working under supervision of the officers. A policy review shows that the regulations have radically reduced the duration of the on-board training for officers since the introduction of the STCW 95 Convention. There are provisions in the Convention for partial substitution of the shipboard training by utilising simulators and workshops for skills development. According to the interview data, officers and ship owners claim that the quality of training being provided through the simulators and training workshops is poor<sup>81</sup>. This does not mean that they totally negate the benefits of this kind of practical training. In this regard, most of the officers have two arguments. The first is about the 'effectiveness' of this sort of training, not only in building up necessary 'skills' but also in becoming 'competent'. They perceive that even in the best situation, when training is carried

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<sup>81</sup> See 5.3.2, 5.4.5, 6.3.2, 6.4.3

out in good quality simulators and workshops by skilled instructors, the skills developed are still insufficient to meet the real operational needs of the workplace<sup>82</sup>. Their second argument is about the quality of the training being provided by most of the training institutes. This includes their concerns about poor quality simulators and obsolete workshop equipment as well as inexperienced instructors (see 6.4.3).

Even the trainers themselves perceive that there are issues with both hardware and software in providing effective practical training to the trainees in colleges (see 7.3.2 and 7.4.5). They attribute the problems mostly to the high expense of simulators and workshop equipment and their financial limitations (see 8.3.2.5.1). Moreover, they claim that by investing more capital in training equipment and facilities, the tuition fees will increase which makes it harder for them to attract students (see 8.3.1.1 and 8.3.2.5.1).

### **8.3.2.7 Training Validation – College versus Shipboard**

There are several routes for the training and certification of merchant ship officers in different MET systems. It can take place either in the maritime colleges or in the universities that offer training programmes to bring trainees to the necessary levels of competence (Gould 2010, p.84). A typical route for the education and training of the officer cadets is through a sandwich course comprising shore-based and shipboard training. However, on-board training is a prerequisite for certification, whichever route is taken.

Research findings suggest that, despite having substantial concerns with the quality of the training being provided in some of the maritime colleges, presently the college-based training is better ‘supervised’ compared to the on-board training. The interview data shows that the ship owners and officers identify under-resourced training institutes as partially to blame for the skills and competency gap of the officers. The shortcomings of the training institutes are mostly attributed to the training facilities, instructors, curricula and duration of the training courses and, very importantly, workshops and simulators, all of which are adversely affecting the quality of officers’ training (see 6.4.3). Nevertheless, the colleges are established with the prime objective of ‘training’. Under such a system, validation of knowledge and skills is undertaken by the training institutes’ own trainers.

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<sup>82</sup> See 8.3.2.1, 3.2.2, National Research Council 1996 and Safahani 2009

However, this is not the case on board ships where ‘training’ is not the prime objective of the shipboard activity. The officers who are expected to mentor, supervise and assess the trainees as well as mentor the junior officers on board ship are not trained for this purpose (see 6.3.2 and 7.3.2). Emad (2011, p. 65) claims that “there is no supervision on the training of mariners on-board ships and thus no assurances that students *actually* develop the required competencies.” My research data supports Emad’s (2011) findings, suggesting that officer cadets spend most of their shipboard training either unsupervised or with limited supervision (see 6.3.2 and 7.3.2).

Recalling the discussion in section 8.3.2.4 about the shortcomings of officers’ training via the traditional model of apprenticeship, the evidence suggests that the maritime training system may need to rethink and incorporate a more relevant mode of training for developing the skills and competency of trainees. In carrying out the literature review about theories of training (see Chapter Three) ‘cognitive apprenticeship’, as one of the modes of ‘situated learning’ appeared to be relevant in bridging the knowing-doing gap of the officers (see 8.4.3.2). However, should this mode of training be deployed on board ship, assessment would need to be made whether the on-board training scene could provide the elements that are necessary for its successful implementation.

The study by Stalmeijer et al. (2009) on cognitive apprenticeship (see 3.2.5 and 8.4.3.2) identified ‘insufficient time’ and ‘lack of teaching skills’ as factors that could inhibit the success of the cognitive apprenticeship model of training. Hence, for on-board training, the mentors (presently officers) should be required to allocate ‘sufficient time’ and have ‘teaching skills’ to underpin the training objectives. The interview data from the officers suggests that, due to many factors which are widely discussed throughout this chapter, under the current manning and training strategies, the effectiveness of mentoring on board ship remains uncertain and variable. The officers perceive that it is not practically feasible to allocate sufficient time for mentoring others on board. Moreover, the documentary analysis of the policies show that there is no provision in the STCW to provide the trainees with the knowledge and skills necessary to enable them to ‘teach’.

For on-board training, trainees are provided with a ‘training record book’ that they take with them when boarding ships. Tasks should be carried out by the trainees under supervision of an officer and the officer in charge of the training is supposed to validate the skills of the apprentice. However, the research findings suggest that for several reasons, as discussed in

earlier in sections<sup>83</sup>, the supervision and skills validation of the trainees are not carried out adequately. Therefore, my research findings accord with Emad's (2011) research in suggesting that both trainers and officers perceive that the specified training objectives, as set within the training record books, are not commonly achieved by the end of the on-board training phase. Consequently, the quality of training and assessment on board ship, which is claimed by the majority of the interviewees to be a fundamental part of the training, remains very unpredictable.

## **8.4 STCW Convention Provisions and Perceived Gaps**

As discussed in Chapter Two, the first version of the STCW Convention neither elaborated on the extent of the knowledge and understanding of the training subjects nor on the competence and the means of skills measurement of the trainees. It was mostly based on regulations in broad terms and was left open to the interpretation of the maritime administrations (Zec et al. 2000). As found later, the Convention requirements were not only deficient in regulating the MET system to provide relevant and uniform knowledge but also lacked requirements for measuring the actual 'skills' and 'competence' of the officers (Moreby, 1999). In addressing the shortcomings, the STCW Convention was revised and comprehensive provisions for the knowledge, skills and competency of the seafarers were introduced (see 2.8.5, Figure 2.3), structured on a CBT model of training (IMO 1997; Emad 2011). The new provisions made the Convention less prone to different interpretations according to Bobb (2000) and Fink (2001). The new CBT mechanism of the STCW Convention alleviated but did not eliminate the possibility of different interpretations. My research findings suggest that even after the latest revision to the Convention in 2010, there are still gaps in this respect<sup>84</sup>.

Some of the skills and competency gaps of the officers, which were associated with the contemporary education and training policies within the STCW Convention, were presented in the previous chapters and earlier in this chapter. Documentary analysis and the research findings show that there are other gaps in the MET policy that are discussed here.

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<sup>83</sup> See 8.3.2.5, 8.3.2.5.1, 8.3.2.5.2 and 8.3.2.5.3

<sup>84</sup> See 5.3.1, 6.4.1, 6.4.3 and 7.2.2

In addition to the training provisions for the trainees, the Convention has set provisions for the qualification of the trainers, supervisors and assessors in college and on board (see IMO 2011, Regulation I/6 and section A-I/6) It requires the maritime administrations to ensure that “instructors, supervisors and assessors be appropriately qualified for the particular types and levels of training or assessment of competence of seafarers either on board or ashore” (p. 84). Furthermore, the Convention requires those who assess the competence of the trainees, either on board or ashore, for the purpose of certification under the Convention to “receive appropriate guidance in assessment methods and practice” and have “practical assessment experience” (p. 84).

The documentary analysis and the interview data suggest that, in partial fulfilment of the Convention’s requirement, the college trainers undergo a special pedagogy familiarisation course (largely known as the ‘Training for Trainers’ course), to acquire appropriate knowledge and skills for teaching and assessment. While part of the mentoring of seafarers is being undertaken by the officers on board ship, there is no ‘explicit’ training provision in the Convention for them to be trained and qualified for teaching, supervision and assessment on board. This is one of the findings of this research. The teaching and mentoring is a dynamic and ongoing process on board ship and it does not apply only to the mentoring of officer cadets. It includes peer mentoring as well. This gap is already affecting the quality and validity of the on-board training. The research findings suggest that this policy gap needs to be addressed by the Convention.

Recalling the discussion in section 8.3.2.4 and 8.3.2.7 regarding grounds for the success of the cognitive apprenticeship model of training, the research findings suggest that the on-board officers, who undertake the mentoring and assessor role, lack the ‘training skills’ element and this undermines the on-board training and results in a skills and competency gap in the officers.

My research findings accord with Emad’s findings, indicating that, “Among mariners, on-the-job training is generally held to be the most effective part of the training system in which they develop the competency needed to act successfully onboard ships. (Emad, 2011, p. 64)”. However, both studies reveal that although there is great potential for skills development on board ships, under the current MET, on-the-job training is neither adequately addressed by the STCW Convention, nor is it being implemented properly. Hence, the learning outcomes of on-board training are not uniform and vary in standard.

Several underlying reasons were identified throughout the research that go hand-in-hand to undermine the quality of on-board training. They include reduction of crew, work intensification and fast turnaround of the ships (and other reasons are widely discussed throughout this research). All of these reasons result in inappropriate and insufficient supervision and mentoring of the officer cadets on board ship, which adversely affect the quality and validity of the on-board training. Notwithstanding all of these issues, the interview data suggests that there is advocacy of the need to increase the duration of the on-board training and this is considered by the interviewees to be one issue which needs to be addressed and reinstated by the STCW Convention.

The STCW Convention prescribes the knowledge and skills requirements for the officers who take management level courses for their second Certificate of Competency. The training for these candidates includes theoretical training plus practical training on simulators and workshops. In addition, the Convention requires the candidates to have a specific amount of approved seagoing service in the capacity of their first CoC. The documentary analysis shows that there is no formal on-board training or ‘training record book’ requirements for these candidates. Interviews with the officers show that although they gain experience and develop their skills while working on board ships, these skills and experiences are mostly for their own rank and they rarely get the opportunity to experience the tasks of the rank immediately above them. As an example, one of the officers stated that:

It all depends on people you are sailing with whether they are friendly and eager to teach you something. There is no clear instruction to make officers accountable to teach others... even now which I am going for promotion [interviewee is chief officer and due for promotion to be a captain in few months] I have never had opportunity to actually practice a ship-handling or play a captain’s role.<sup>85</sup> (SF22)

It shows a multifaceted disorder in the training system which includes:

- the lack of a systematic means of skills and competency development for this group of officers;

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<sup>85</sup> See 6.3.2

- the lack of appropriate provisions in the STCW Convention, such as a ‘training record book’ requirement of the officer cadets, to provide guidelines to the officers for uniform skills development after their first CoC;
- a lack of on-board training procedures to make the officers accountable to the ship owners for providing mentoring to junior staff;
- a lack of monitoring of the implementation of the training requirements by the maritime administrations of the flag states.

Next, based on the research data, the measures being taken by the ship owners and trainers to address the skills gap of the officers will be discussed.

## **8.5 Measures Used to Address the Competency Gaps**

One of the research questions asked the interviewees whether they addressed the perceived gaps between the training being provided to the officers and the actual skills they needed to perform their assigned duties. Compared with the comprehensive answers the informants provided to the other research questions, the answers to this question were very short and revealed that the measures taken by the stakeholders were sporadic and not extensive. Among the ship owners, again, the size and resources of the company determined the type and extent of the measures they took in addressing the competency gap of their officers. Trainers’ answers were also limited but they mostly claimed that, should the industry stakeholders financially support them, they would have the capacity to take appropriate and extended measures to address the gaps. Officers’ answers were very limited. Many of the officers claimed that the ship owners and trainers should be expected to take appropriate measures to enhance the MET and that this would, in turn, help in bridging the officers’ competency gap. They claimed that the officers’ role in bridging the gap was limited to attending short courses, self-study, supporting on-board training and mentoring fellow seafarers.

### **8.5.1 How do the Employers Address the Perceived Gap Between Training and Skills?**

Recalling the distinction made between the companies’ sizes in Chapter Four (see 4.7.1.3) and earlier in this chapter (see 8.3.2), it is perceived that there is a correlation between the size and



resources of the companies and their approach and strategies towards addressing the skills and competency gap of the officers.

The interview data reveal that not all of the shipping companies claim to have the intention, ability or resources to address the officers' skills gap. Only those comparatively bigger shipping companies, who recognise 'human resources' as one of their main assets, have established policies in supporting seafarer training programmes. This category of shipping companies has either their own training centres or they outsource their seafarers' training needs to standard marine training colleges and training providers. They recognise their responsibilities towards their workforce and this is the reason for dedicating part of their resources to addressing the skills and competency gap of their seagoing personnel. My research data shows that the companies that invest in training have fewer problems with the quality of their officers and find their officers loyal to the company<sup>86</sup>. In contrast to this group of shipping companies, the interview data shows that most of the shipping companies with comparatively small fleets, a limited number of sea staff and limited resources, neither get involved with the training of the officers nor show any intention in doing so (see 5.2.1). Their sea personnel are mainly either poached from other shipping companies or recruited from the global workforce pool of officers; they perceive the labour market to which they have access as containing a relatively low standard and low quality workforce (see 5.2.1).

It is worth mentioning that amongst interviewees even the small shipping companies and the ship managers who are operating small fleets admit that the ship owners, in order to get access to quality officers, need to step forward and get involved with the training schemes. Although the maritime administration of some of the countries (e.g. the UK) has introduced incentives such as 'tonnage tax' and 'Support for Maritime Training Institutions (SMarT)' (see Gekara 2008 and Gould 2010), still the effectiveness of these schemes in persuading the shipping companies to get involved with the officer cadet training remains low (Gekara 2008).

Ship owners express their concerns about the skills and competency gap of the officers and their views are founded upon a range of information (see 5.2). Based on this information, they realise the officers' skills and competency gap is a basis for identifying the officers' training needs. Depending on the type and extent of the gap, a range of measures are taken. These

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<sup>86</sup> See 5.2.7, 6.4.4, 7.4.3

measures include enhancing training curricula, arranging short training courses for the officers, introducing computer-based training on board ships and despatching tailor-made training material and training videos on board ships (see 5.2.1).

In contrast, once they realise that an officer has a critical skill gap, some shipping companies either dismiss the seafarer by not extending his/her employment contract or ask the officer to attend necessary courses during their leave period ashore (see 6.2.6). Officers then need to produce evidence to the company that training has been undertaken to rectify the skill gap. Such companies impose the burden of all expenses on the individual officers and do not contribute to addressing the skills gaps of their workforce.

#### **8.5.1.1 Enhancement of Training Institutes' Training Curricula**

Training needs applications are one of the means by which the ship owners' form their perceptions about the skill gaps of their workforce. Several interviewees claim that some of the training needs applications they receive contain requests for generic courses for officers. This is an indication for the ship owners that basic skills are lacking and that they should investigate the root causes of the deficiency. The ship owners claim that, in such cases, the reasons are mainly attributed to the quality of training being provided by the training institutes. Shipping companies have different approaches in dealing with this situation. One is liaising with the training colleges, advising them of the shortcomings and asking for modifications in the main training courses that are mostly the cause of the knowledge and skill gaps. This is mainly the case with ship owners who either have their own training establishments or outsource their training needs through long-standing contracts with the training providers. Research data suggest that this group of shipping companies, having the majority of their workforce trained in specific colleges, find it easier to rectify the identified gaps.

Research findings suggest that in some of the training institutes there can be two training programmes for the same subject. One is based on the minimum training requirements of the STCW Convention and the other is an enhanced training programme, the design of which is based on the requirements of the sponsoring shipping company. The course duration, curriculum and occasionally even training facilities are different with increased tuition fees for the latter type of programme. Most of the informants refer to this issue and they perceive a disparity in training outcomes of the different programmes. It is noteworthy that once trainees

from both are certificated, they receive identical certificates and the Certificate of Competency does not reflect the substantial differences in their training.

#### **8.5.1.2 Short Training Courses for Officers**

Research data show that some of the shipping companies occasionally provide short training courses for their workforce. These training courses range from general, short courses for all the seagoing workforce to address a common skills gap, to tailor-made short courses for company-specific extra skills the officers may need to fulfil their assigned duties. The research data shows that officers advocate the effectiveness of such purpose-designed training in bridging their skills gap.

It is noteworthy that, from the officers' point of view, addressing their skills and competency gaps through ship owners' sponsored courses, increases their links with the company and keeps them motivated and satisfied. Consequently, companies benefit from such an investment on training through the enhanced level of safety and efficiency of their ships and increased retention rate of their workforce.

#### **8.5.1.3 Introduction of Computer-Based Training Courses On Board Ships**

The idea of deploying technology in training on board ships emerged soon after the marine approved computers were integrated in the equipment and machinery of the merchant vessels. Training providers have developed a range of generic and tailor-made training courses and introduced them on board ships. This is a relatively cost-effective option for the ship owners to address the skills gap of their sea personnel and previous research on the effectiveness of computer-based training indicates that seafarers mostly advocate it as an efficient training tool (see Ellis et al. 2005). The interview data suggests that the ship owners provide computer-based training on board their fleet not only as a tool to address the minor skills gap of the seagoing personnel, but also as proof of a 'continuous training programme' which is part of the ship owners' responsibilities in the ISM Code and the STCW Convention requirements (see IMO 2011, Regulation I/14 and ISM Code, Regulation 6).

Ship officers' accounts indicates that they advocate computer-based training methods to rectify minor knowledge and skills gaps. They find them more efficient on board ships engaged on long voyages (e.g. bulk carriers) than those with fast turnaround and frequent port calls (e.g. container ships).

#### **8.5.1.4 Despatching Tailor-made Training Material and Training Videos On Board Ships**

One of the means being used by the ship owners to enhance the knowledge of seagoing personnel, fulfil a mandatory requirement of the Convention and at the same time address the identified skills gap of their officers is to send training materials on board ships. These training materials include technical text books, technical journals and periodicals, training videos, accident and incident reports, fleet circulars containing synopses of accidents, incidents and near-miss reports. They perceive that sending these materials on board ships could help in bridging the knowledge and skills gap of the officers. The officers' accounts suggest that such training material is helpful in keeping their knowledge updated. However, not many of the shipping companies supply these training materials to their ships.

With an increasing number of vessels using online or 'store and forward' internet technology (to reduce the communication costs), it is stated by the ship owners that, despatching training material on board ships is becoming more feasible and affordable. However, some of the ship owners are still uncertain about the effectiveness of this training mechanism on board ships, especially on board container carrier vessels and the vessels engaged in short voyages, due to the excessive workload, fast turnaround of the ships and personnel fatigue. They say that officers on board this category of ships do not find enough time to use such training materials.

All the above is based on what the employers claimed to be doing to bridge the perceived gap in competency of the officers. However, the relevance and effectiveness of these measures needs further research.

### **8.5.2 How do the Officers Address the Perceived Gap between Training and Skills?**

Research findings show that although the actions officers take to address the perceived competency gap are limited to attending short courses, self-study and mentoring, these could have a significant effect on bridging the gaps. Included in the officers' responses were measures taken to address their own skills gaps, as well as those of their fellow seafarers.

#### **8.5.2.1 Attending Short Courses**

Interview data shows that the officers who have their companies' training support find it easier to address their skills and competency gap by applying for specific training courses. The

company arranges and pays for the training and mostly the officers benefit from a paid-training scheme in which the training time is not reduced from their leave allocation and they receive a salary while attending the course.

However, this is not the case for the self-sponsored officers. There are several reasons for them not to take effective action in addressing their competency gap. One is the cost involved with attending the extra training courses, which they consider expensive. Another is their reluctance to spend their leave period for training purposes. Being away from family and social life, and many other reasons (Hill 1972 and Sherar 1973), makes the shore leave period very precious to the seafarers. The research data shows that they rarely show interest in attending short courses unless they are a prerequisite for their next contract, which makes paying to attend the extra training inevitable.

#### **8.5.2.2 Self-study**

Self-study is considered by the officers to be an effective and inexpensive means of addressing perceived gaps but there are limitations to this method. These include the availability of the appropriate training material on board ships (see 8.4.1.4) and allocating time to use it. Moreover, the reading material can commonly address the ‘knowledge’ gap, while the gaps are mostly identified to be in ‘skills’.

Research data shows that not many of the ship owners who were interviewed provide appropriate and sufficient training material for on-board training purposes.

#### **8.5.2.3 Mentoring**

Recalling the discussion earlier in this chapter regarding the significance of the on-the-job training and the role of ‘mentors’ in skills development within the ‘community of practice’, ‘mentoring’ is seen as an important means of addressing the competency gap of the officers. Research data shows that all the officers, at some stage, have addressed the skills gap through mentoring. They have either been mentee or mentor and through this process they have built up their own and helped in building up their co-workers’ skills to bridge the knowledge and skills gap. It has been widely discussed in this chapter how, under the current ship operation practices, this important means of teaching and learning has been undermined. However it is still perceived by the officers as an efficient means of addressing the competency gap.

### **8.5.3 How do the Trainers Address the Perceived Gap between Training and Skills?**

Trainers' perceptions about the skills and competency gap of the officers is informed through a range of internal and external evidence (see 7.2). Training needs are identified based on that evidence. In addressing the training needs, trainers either modify the existing training programmes or design new courses to bridge the gaps. However, trainers claim that it is not feasible to address all of the identified training needs, unless the customers incur the expenses. Research data suggests that, from the training providers' point of view, education and training is a business (see 7.3.1 and Lewarn 2001). There should be an incentive to make changes to the existing course or introduce new courses. Hence, their business interests are always paramount.

Some of the modifications to training programmes are in response to a training institute's non-conformance with the regulations that are detected through the audits of the accreditation bodies' (usually maritime administrations or their representatives). These types of corrective actions are inevitable regardless of their cost to the institute. In order to remain on the approved training providers' list, the training institutes need to take appropriate actions and these actions mainly aim to help improve the quality of training. In turn, they help to alleviate the knowledge and skills gap of the trainees. Some other changes and modifications to the training programmes are as a result of the introduction of new rules and regulations to the training standards and trainers have obligations to comply with them.

Research data indicates that the training institutes have access to a rich body of information, including examination results, course evaluations, feedback from shipping companies and trainees, etc. Should the information be utilised properly, deficiencies within their training systems that may result in the knowledge and skills gap are largely identifiable even before the trainees embark on their jobs. While some of the training institutes claim that they do not have sufficient resources to process the information, there are others that utilise it appropriately to detect the knowledge and skills gap and take corrective actions to their systems.

Except for the changes mentioned above, almost all others types of modifications to the existing training programmes or design of new training courses are either based on customers' specific demands or with the aim of introducing new training in response to the industry's needs.

The main actions the trainers take to address the gaps include periodic curriculum reviews, upgrading the trainers' knowledge and skills, upgrading the training facilities, providing trainers with extra tutorials and reviewing and upgrading the training record books.

### **8.5.3.1 Enhancement of the Training Curricula**

Trainers receive information about the cadets and officers' progress through a periodical training system review. The outcome of reviews may suggest changes to the training curricula. Trainers claim that they mostly get positive results in updating and modifying the content of training programmes. Applying changes is not always easy since any changes to the approved training programmes may need maritime administration's approval. There are resource and financial limitations in the colleges (see 7.4.5) as well as bureaucratic hindrances to obtain the accreditation body's endorsement which make the modifications challenging. There are other limitations to what needs to be done, including the limitation to the duration of the training programmes as well as trainers' competency. Despite detecting the gaps and shortcomings to a training programme as the result of time constraints, trainers claim mostly that they have to compromise on the corrective action since the training programmes should be completed within a fixed timeframe (see 7.4.4 and 7.4.5). Increasing training time imposes extra expenses and it is not always possible to convince the shipping companies and/or self-sponsored trainees to incur extra tuition fees for extended training<sup>87</sup>.

The interview data suggests that despite encountering hindrances in applying changes to the training course curricula, some of the training centres take proactive measures in detecting the shortcomings and making changes to bridge the gaps and even provide extra training in excess of the minimum requirements of the Convention. However, the industry's literature suggests that most of the training institutes are reactive and keep to the minimum requirements.

### **8.5.3.2 Designing and Conducting Short Training Courses**

Designing and providing short training courses is another measure of addressing the knowledge and skills gap of the officers. The interview data show that some of the training institutes take proactive measures to detect the competency gaps of the trainees and propose short training courses to the shipping companies or the training sponsors to address the gaps. These courses

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<sup>87</sup> See 6.4.4, 7.2.1 and 7.3.4

may also be designed and offered in response to the individual trainees' requests or specific needs of shipping companies. Research data suggest that both ship owners and officers find these courses effective and successful.

### **8.5.3.3 Enhancing Training Institutes' Resources**

Training institutes' resources include their infrastructure, classrooms, simulators, workshops, libraries and most importantly, in the perception of the informants, the trainers. Enhancements made to any of the above-mentioned resources can have a positive effect on the training programme outputs.

Almost all of interviewees claim that the quality of simulators and workshops have significant effects on the training outcomes. Upgrading these facilities is one of the measures the training institutes take in order to enhance the training quality and to narrow the skills gap. However, some of the trainers claim that most of the training institutes have financial limitations that restrict the provision of high standard training facilities, simulators and workshops. However, they do not deny the influence of these facilities on the quality of training. They also state that they do not receive any financial support from ship owners or state sponsors to upgrade the training facilities and until those stakeholders step forward to take some responsibility for the MET system, the situation is not likely to improve.

Some of the trainers state that the enhancement of the training facilities needs extra investment that, in turn, increases the tuition fees. This is one of the drawbacks of attempting to enhance the facilities since the training institutes lose their competitive advantage in attracting the large population of the self-sponsored trainees who demand the cheapest possible training courses. Lewarn (2001, p. 209) states, "Commodification of education is not new as education services have been bought/sold over many years." He further suggests that education is highly market-oriented and trainers provide "what the customer wants not what it [training provider] thinks the customer wants (p. 210)." He concludes in his study that most of the maritime training institutions do not possess sufficient resources to address the rapidly changing training needs. Hence, to grasp the training opportunities without compromising on the quality necessitates closer partnership between training providers in making investments on highly expensive training facilities and equipment.

Guadalupe (2010) considers 'trainers' as the most important agents in the educational process. Most of the informants highlighted the significant role of the instructors in the training system.



From their point of view, having profound knowledge and experience of the subject as well as proper aptitude in conveying knowledge to the trainees are two of the main characteristics of a good instructor. The interviewees unanimously emphasise the significant role of the trainers in the training system output. However, there is a considerable gap in this respect. The research data reveal that only some of the trainers have procedures for upgrading their instructors' competency on a regular basis. Through upgrading and updating their lecturers' knowledge and skills, they perceive that the quality of the training courses are improved. Documentary analysis of the training institutes' records shows an increased satisfaction and success rate upon appointing skilful and experienced trainers.

#### **8.5.3.4 Revising Training Record Books in Collaboration with the Concerned Stakeholders**

Providing evidence of 'structured on-board training' is one of the mandatory requirements of STCW Convention requirements (see IMO 2011, Regulations II/1.2.2, III/1.2.2, A-II/1.6.3, A-III/1.2.3, A-II/6.2.3 etc.). According to the trainers' accounts, the training record books are the only means in the current MET system that aim to standardise the on-board training of the trainees. Trainers claim that there is not any effective system enabling the training institutes to monitor and assess the trainees' activities on board ships (see 7.3.2). Presently, the training record books are the only official means of gauging the shipboard training. Therefore, it is necessary to pay special attention to compose comprehensive record books for the trainees that may better assure the objectives are met. According to trainers' accounts from some of the training institutes, they compose the training record books in collaboration with the Administration, shipping companies and trade unions in order to fulfil the knowledge and skills requirements of the concerned stakeholders and review the record books on a regular basis. However, the research data suggests that not all training institutions are using standard record books or updating the existing ones.

The interview data with ISF, SIGTTO and INTERTANKO suggest that they have been pioneering the issue of upgrading the training record books. The SIGTTO and INTERTANKO record books are very specialised and designed for the tankers and gas carriers. However, the one produced by ISF is more generic and IMO has recommended that the trainers use or benchmark the ISF on-board training record book (e.g. see IMO 2011, p. 97).

The importance of the training record books is recognised by both officers and trainers. However, they mostly perceive that even by having the best training record books, under the

current training settings on board ships, the quality of practical training on board remains uncertain (see 6.3.2 and 7.3.2).

## **8.6 Impediments to the Education and Training of the Officers, as Perceived by the Stakeholders**

Research findings reveal several determinants, as perceived by the informants, which cause limitations to what can be expected from the education and training of the officers. These mainly have roots in the current policies and the socio-economic setting of the shipping industry. The perceptions of the different groups of interviewees are mostly identical. The informants attribute the factors that bring limitations to the education and training to a range of issues including the objectives of the STCW Convention and disparities in implementation of the training policies within the current structure of the MET system, the training institutes' resources, the diversity of ship types and equipment and last but not least, the quality of intakes and personal motivations. The officers add more factors to the common perceptions. They highlight the diminishing role of the ship owners in supporting the training expenses, crew reduction, and job intensification as elements that are impeding the education and training of the officers, ashore and on board ship. All of these elements are incorporated, as appropriate, in the discussions and analysis throughout the previous sections of this chapter.

## **8.7 Summary**

This chapter examined the core findings of the employers', employees' and trainers' accounts of the perceived competency gap of the merchant ship officers. At the outset, by examining how and why the stakeholders' formed their perceptions, the significance of the research question was verified. In scrutinising the nature of the perceived gap, a distinction was made between the theoretical and practical training of the officers.

Throughout the chapter, the underlying reasons behind each key finding were discussed and what emerged was that the gaps broadly resulted from the twin determinants of globalisation and the technological advancement of ships and equipment. These transformed the organisation of shipping and the nature of the job by introducing a complex range of changes to the shipping industry such as the global labour market, multinational crew and reduced workforce on board ships. Subsequently, there was a shift in the education and training of seafarers from the

established MET system within the traditional maritime nations (TMNs) to the newly emerged labour supplying countries with different socio-economic settings. Among other effects, this caused variation and decline in the quality of the officers from new labour suppliers.

Incorporating the ‘experiential learning theory’ into the discussion divided the perceived shortcomings into ‘knowing’ and ‘doing’ gaps. Comprehensive discussion and analysis revealed that there are differences, and occasionally contradictions, in the perceptions of the stakeholders.

The key findings in the perceived ‘knowing’ gap were broadly related to the commercial, technical and social knowledge of the officers and examples of each category were presented. The underlying reasons for the gaps were thoroughly scrutinised and significant loopholes in the STCW Convention and its implementation within the MET system were identified. One of the key findings in this area was the dearth of training provisions within the Convention to address the social and cultural issues in the predominantly multinational workplace on board ships.

Most of the key findings of the research were related to the officers’ skills and competency gap, introduced in this chapter as the ‘doing gap’. Examples of the competency gap of the officers were broadly related to technical operation and soft skills, such as team working, management and leadership. The underlying reasons for the skills gap of the officers were extensive and they were mostly intertwined. Examples were shortcomings in the provisions of the Convention, inconsistency in implementation of the Convention requirements, significant reduction of the practical training in the workplace, shortcomings to the training institutes’ facilities and the diminishing role of the ship owners in supporting the education and training of officers.

Whether the perceived competency gaps are addressed by the stakeholders, what measures are taken and, to some extent, the effectiveness of these measures are questions that were then discussed. It was revealed that there is a correlation between the size of the shipping companies and their strategy in addressing the competency gap of the officers.

The informants’ perceptions of the factors that limit what can be expected of ‘training’ were incorporated into the discussion and analysis throughout the chapter. The limitations identified included quality of the intakes, personal motivation, training institutes’ facilities, diversity of ships and equipment, financial constraints and the objectives of the Convention being set as

the 'minimum' training requirement, all of which affected the outcomes of the maritime education and training.

# CHAPTER NINE

## Conclusion

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### 9.1 Introduction

This research undertook to examine the perceived gap between the training being provided to employees and the actual competence they need to perform their duties in order to be considered ‘fit for purpose’ by their employers in the maritime domain. It sought to study the main stakeholders’ insights into the effectiveness of the contemporary Maritime Education and Training (MET) system and understand the underlying reasons for the perceived shortcomings in the skills development of the merchant ship officers.

As explained in Chapter One, the idea of this research emerged from my own personal experience as a seafarer, working on board ships with multinational crew with diverse educational backgrounds. I could personally observe the inconsistencies in the competence level of fellow seafarers but could not come up with explanations for the reason(s) behind such a noticeable knowledge and skills gap. Different stakeholders further shared this personal observation but they could not provide detailed and overarching explanations for this perception. All of these factors led me to embark on this research project to examine the validity and extent of this perception. In this quest, I examined the main stakeholders’ views, incorporated the literature and applied the relevant learning theories, which collectively helped me to infer that the competency gap of the merchant ship officers is indeed a prominent issue.

The underlying factors for such a competency gap and inconsistency in the training of the merchant ship officers are largely rooted in two major phenomena. Firstly, the globalisation of shipping that led to practices such as flagging out, the emergence of a global labour market for seafarers and the shifting of maritime education and training from TMNs to newly emerging labour-supplying nations with varying socio-economic contexts. Secondly, advances in

technologies and equipment that not only caused significant changes to the nature of the work, requiring new skills, but also affected the process of learning.

In this chapter, I will highlight the key findings of the research as well as supplementary but important findings. I will also elaborate on the main empirical contributions of the study towards the skills development of seafarers. Furthermore, I will indicate how the study contributes to the literature on the application of experiential learning theories in maritime education and training. I will close the chapter by pointing out the limitations of the study, make recommendations regarding policy and practice in maritime education and training and finally suggest areas for future research.

## **9.2 Key Findings**

There is a large body of literature that explains how people learn through education and training (see Darling-Hammond et al. 2001). Essential components of education are students, teachers, curricula, learning environments and instructional methods. In the context of this research, the essential components are cadets and officers, trainers, MET curricula that are based on the STCW Convention, training centres and/or the shipboard workplace, as well as the instructional and training methods used in various MET systems respectively, which are all widely discussed throughout this thesis. Deficiencies in any of these essential components may result in a gap between training objectives and outcomes. These outcomes are the knowledge, skills and competencies for which the seagoing workforce is being trained.

The literature indicates that the main stakeholders in the maritime industry perceive a competency gap among the merchant ship officers. Hence, the main research question set out to examine the veracity of these perceptions, understand the underlying reasons and identify which gaps lay in any of the above essential components. A qualitative research strategy was adopted to develop answers to the research questions. The research drew on a combination of documentary analysis and semi-structured interviews to investigate the views of ship owners, officers, trainers and relevant maritime institutions such as IMO, BIMCO and MNTB.

During my investigations, the informants highlighted a number of salient examples to demonstrate the existing gap<sup>88</sup>. However, the examples provided were not exhaustive. For my purpose, the research design was tailored more to understanding and conceptualising the broad nature of the gap, which is categorised here as the ‘knowing’ gap and the ‘doing’ gap (Pfeffer and Sutton 2000), and to exploring the underlying reasons for the gap. Providing an exhaustive list of theoretical and practical training provisions, which would help to bridge the perceived gap, would require further research involving an intensive study of the training policies. (See 9.7)

In identifying the underlying reasons for the gaps in knowledge and practice, it should be first pointed out that the training of officers is in actual fact a continuum from training centres to on board ships. When we look at training centres, there are gaps in the means of developing both knowledge and practice. Some of the prominent underlying reasons for the knowledge gaps at maritime colleges include, inter alia: those that stem from shortcomings in policy such as obsolete subjects included as well as essential subjects not included in the curricula that relate to the STCW Convention, trainers not up to date in the knowledge that is relevant to contemporary shipping needs, as well as inconsistencies and variations in the design of curricula among different training centres. When we come to the practice gaps, the reasons include, inter alia: under-resourced training colleges due to different socio-economic contexts, for instance obsolete machinery and equipment in workshops, poor-quality simulators and instructors lacking up-to-date skills and experiences.

When we look at the on-board end of the continuum, unlike training centres that are dedicated settings for training and have, arguably, a system of monitoring and assessment, the primary aims of the ship are commercial activities as opposed to training. Nonetheless, the on-board training component remains an essential part of the skills and competence development of seafarers. Yet, there is neither an effective system of monitoring and assessment for the on-board training, nor officers whose sole function on board is mentoring. Their main roles in the

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<sup>88</sup> See 5.3.5, 6.3.1, 6.3.2, 7.3.4

current intensified working environment are operational and commercial. Here again, there are gaps in both knowledge and practice. In order to flesh out the underlying reasons that contribute to on-board training gaps, I have found it useful to draw from situated learning theories that include traditional apprenticeship and cognitive apprenticeship approaches within the communities of practice.

In shipping, apprenticeship had been the traditional mode of learning where both knowing and doing took place in the same locale, i.e. on board. However, in contemporary maritime education and training most of the theoretical education and part of practical skills learning (in the form of simulators and training workshops), have been relocated to training institutions. Yet, the data from this research strongly indicate that on-board apprenticeship is still regarded as crucial to develop the competence of officers (see section 2.7.5). As “competency requires the application of specified skills, knowledge and attitudes relevant to effective participation in an industry” (DEEWR 2007, cited in Guthrie 2009, p. 18), as well as the development of ‘social’ qualities such as professional identity, confidence and motivation (Bleakley 2002; Dornan et al. 2007), on-board apprenticeship remains a critical component in the MET system. Yet, according to the Convention, the focus of building the competence of officers resides in training colleges. This is due to the narrow conception of ‘competence’ in the Convention which tends to overlook the above aspects of what constitutes competence. This can be clearly observed from the reduced on-board training period stipulated in the Convention<sup>89</sup>. The literature and research data reveal this training approach could be one of the potential causes of the competency gap of the officers since it does not appropriately address all of the determinants needed for development of ‘competence’. Whereas the officers perceive that the ‘competence’ they need to perform their assigned duties is more than just having ‘knowledge’ and ‘skills’, and that they need to develop their professional identity to be able to turn their knowledge into practice in the actual work place, this is not appropriately accounted for in the Convention.

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<sup>89</sup> See 2.9, footnote 21 and 7.3.2



Furthermore, as pointed out earlier, the introduction of modern technologies led to changes in skills that became increasingly ‘non-visible’ and subsequently changed the learning process. This means the traditional apprenticeship mode of learning which was largely based on observation became less effective. This was because the new skills required for modern technologies are what are referred to as less visible (Bakker et al. 2006). According to Resnick (1989), in jobs that are technical, neither the technical processes nor the thought processes of the ‘experts’ are visible. Therefore, it is not always the case that the apprentice can gain the skills only by observation. Hence, the important question is how to tailor on-board apprenticeship, which remains an important component of the MET system, to modern shipping practices.

In light of the changes in the shipboard practices discussed above, the model of apprenticeship that appears to be currently practiced on board is what is known in learning theories as the cognitive apprenticeship. However, since this model is neither consciously implemented nor reflected upon, the prerequisite conditions that are necessary for it to be effective in skills development are not known to those involved in mentoring roles. Hence, to identify the prerequisite conditions that are lacking in the on-board setting, I looked at literature to see how it has been applied in other settings. There were studies that attempted to apply this learning approach in medical settings. Their findings indicated certain issues that were noted to be lacking that undermined the effectiveness of the approach in that setting. Among these, the following are relevant to the shipboard practical training context: insufficient time and lack of teaching skills of the trainers<sup>90</sup>. While in the past there used to be designated training officers on board who were trained to train cadets, in the context of contemporary shipping and subsequent cost reduction strategies adopted by ship owners, this practice no longer exists. Hence, the officers currently on board do not have the necessary skills to train cadet officers. Furthermore, with reduced manning levels and intensification of workload on board (see Smith 2007), the availability of sufficient time for officers to dedicate to mentoring is limited. In addition to the aforementioned two factors, the cognitive apprenticeship approach is situated

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<sup>90</sup> See 3.2.5, 8.3.2.4 and 8.3.2.7

within the communities of practice. Yet, contemporary crewing patterns that consist of multi-national crew, undermine the development of effective communities of practice on board. This can be attributed to issues of cultural differences, language barriers, socialisation, etc.

These theories of learning take us only so far in identifying the underlying reasons for the knowledge and practice gap on board. There are two other important reasons that are not accounted for by the analytical tools offered by these theories. These are the absence of an effective monitoring mechanism for the training that takes place on board, and the lack of progressive mentoring on board at different stages in the careers of officers, i.e. mentoring of officers by their seniors. There is also no monitoring for the practical training of the officers in preparation for their subsequent CoC qualifications. The officers obtain their first CoC and go on board to carry out their duties. However, there is also the expectation that they prepare themselves for the next stage of their training while they are working at sea. Nevertheless, there is no monitoring and guiding mechanism in this area in the form of an officers' training record book (similar to the cadets' training record book). Hence, this undermines the continuity as well as uniformity of officers' continuous training and skills development.

Changes to the education, training and learning patterns in the MET system due to both globalisation and technological changes of the industry, demonstrate that the preconditions that were in place to support the traditional apprenticeship model on board ships, no longer pertain. However the way education and training is currently being delivered assumes that the preconditions necessary for effective training via this model still exist. If the learning theories are to be effective, it is necessary to either revive the preconditions that previously existed (which, in most cases, would not be feasible) or adopt more appropriate training and learning mechanisms for skills development.

So far, I have discussed the key findings in relation to gaps in knowledge and practice at the colleges and on board ships as well as the main underlying reasons. There are also a number of key findings in relation to differences in perceptions and contradictions in expectations among the relevant stakeholders. One such difference is in the conception of what constitutes a 'fit for purpose' officer. The research revealed a difference in perception between ship owners

and officers on this issue. When the ship owners elaborated on the quality of the workforce, their immediate perception about the skills and competency gap of the officers emerged from their 'business oriented' expectations. They saw the 'commercial activities' knowledge gap as the prime issue that needed to be addressed in the officers' competency. However, this was not the case with the officers' own perception. In expressing their own experience and on reflecting on their observations on their fellow officers, they gave the first priority to the 'safety-related' issues when considering the skills and competency gap. This does not mean that either of these groups did not recognise the other's perception, but they had different priorities.

Furthermore, there were also variations in perceptions between the ship owners and trainers. The ship owners, while recognising the mission statement of the STCW Convention, which is set to regulate minimum education and training requirements of the seafarers internationally, perceived that the Convention should prescribe a whole range of training with the output of a 'plug and play' workforce, i.e. officers who are trained to respond to a full spectrum of issues, including commercial ones. However, in contrast, the trainers perceived that the 'commercial knowledge' training provisions should not be included in the Convention since there could be a conflict of interests between 'safety' and 'profitability', as the former is costly but the latter involves minimising expenses. They perceived that separate additional sets of knowledge and skills requirements should be developed to address the commercial activities needs of the shipping operation. They claimed that appropriate training schemes could be developed and conducted by the training providers, if the shipping companies or individuals bore the extra expenses that would arise as a result of such inclusion.

On the one hand, while the research data show that the employers insist that the STCW should prescribe a wider range of training requirements for the officers and encompass commercial activities, the officers claim that the shipping companies, in order to reduce the training period and costs, try to influence the maritime administrations to stick to the minimum requirements (see 6.4.1). Hence, there seems to be some 'self-contradiction' in what the ship owners expect from the STCW Convention. As a result, they seem to simultaneously call for increasing the training period (as a result of expanding the curricula) and decreasing it (as a result of sticking to the minimum provisions).

Finally, two key findings relate to issues of intake of trainees and size of companies. When considering intake of trainees, ship owners lamented that there were an insufficient number of applicants for the seafaring career. However, officers and trainers were more concerned with the perceived decline in the quality of intake as one of the factors that affect the nature of training outcomes. While not specifying what that ‘decline in quality’ constitutes, they emphasised that the volume and diversity of training that needs to be imparted to the trainees in a relatively limited span of time affects the outcomes vis-à-vis the quality of intakes. In relation to the size of companies, the data suggests that there might be a correlation between the size of the companies and the extent to which they contribute towards the training of their workforce. Hence, larger companies are likely to have relatively fewer issues with the skills and competencies of their officers as they have more effective human resource strategies from the selection to the continuous training and development of their workforce.

### **9.3 Supplementary Findings**

In addition to key findings, there are also a number of important supplementary findings. One relates to the growing number of under-resourced and low-quality training providers due to the increasing number of self-sponsored officers who seek cheaper training courses. As pointed out earlier in the chapter, providing maritime training is often an expensive enterprise. However, the data suggests that with the increasing number of self-sponsored officers who are constrained in their finances, there is a potential that the number of under-resourced training colleges providing cheaper training for these officers will increase. This trend would subsequently undermine the quality of training being provided to the officers.

Another important finding from the analysis of the STCW Convention is that the Convention does not impose obligatory requirements on ship owners to support on-board training. The terms used in the Convention mostly ‘recommend’ or ‘encourage’ the ship owners to support the on-board training. Hence, ship owners do not have any statutory obligations to take active roles in the training of officers. Furthermore, the documentary analysis shows that ship owners either do not have appropriate training procedures in place or do not monitor the

implementation of such procedures on board. Thus, the officers are not held accountable for their mentoring practices, or lack thereof, on board. In addition, whereas it is well accepted for cadets to learn from the officers and ask questions, the research indicates that officers have a tendency to be reluctant in approaching their seniors and asking questions for fear of being judged incompetent and the subsequent effects on their careers such as delayed promotions, reduced bonuses or even being fired. This undermines the continuous skills development of officers and peer mentoring on board which needs to be addressed.

Finally, all of the officers interviewed, while showing enthusiasm in participating in this research, pointed out that they had never been given the voice to provide their opinions based on their own experience. This suggests that seafarers are not often consulted and given voice in the formulation of policies which directly concern them and affect their careers.

## **9.4 Contribution to Knowledge**

As pointed out in Chapter Two, there is limited academic literature that examines the validity of the widespread perceptions regarding the skills and competency gap of officers within the industry. Furthermore, there is a significant gap in the literature in identifying the underlying reasons for such a skills and competency gap. The limited research that exists is quite narrow in scope, while teaching and learning theories are underexplored in the context of MET. In addition, there has not been a holistic exploration of the views of the main stakeholders in the industry who are directly concerned with the training of officers. Hence, the main empirical contributions of this study fill the aforementioned gaps in the literature.

As demonstrated in the empirical chapters, there is strong evidence that confirms that a competency gap exists. This thesis has also made a wide-ranging exploration of the underlying reasons behind the competency gap that simultaneously incorporates consideration of the issues of globalisation and technology. In addition to exploring the views of the main stakeholders, the study also makes a unique contribution by identifying important discrepancies in the priorities of ship owners and seafarers regarding the nature of the competency gap. Furthermore, the study identifies the contradictory demands made by ship owners concerning

the changes they wish to see in the STCW Convention to address the gaps they deem important. This contradiction pertains to their desire to stick to the minimum STCW requirements, while at the same time requesting the inclusion of extra knowledge and skills to tackle commercial activities in the Convention. Finally, a further empirical contribution is in the richness and novelty of the data generated in the course of this study.

This study does not claim to offer a ground-breaking contribution towards theories of learning. However, by studying the findings of a cognitive apprenticeship approach in a medical setting and examining its applicability in a global industry, it has made a contribution by identifying the factors that contribute to the effectiveness of such an approach and has subsequently enriched it. Some of the factors identified, such as the training of trainers and time constraints on board, corroborate the findings from the studies in the medical setting (see for example Bleakley 2002; Dornan et al. 2007; Stalmeijer et al. 2009). Furthermore, the unique global, multi-national, multi-cultural and technical context on board, has helped to identify important factors that need to be considered to enhance the effectiveness of the cognitive apprenticeship approach, such as issues of cultural and language barriers, socialisation, etc.

The literature on skills development on board ships mostly draws from the apprenticeship model of training. However, as the findings of this research have shown, there is a community of practice on board ships which constitutes a rich source of knowledge and skills that can be utilised in the training process. As I have pointed out in this thesis, certain limitations should, however, be borne in mind when thinking about the effectiveness of the community of practice on board. These limitations include cultural, linguistic and social barriers, which stem from various determinants such as multinational backgrounds of members of the community of practice. The literature on communities of practice on board ships is underexplored. This thesis has made some contribution to the literature by foregrounding the relevance of communities of practice to the on-board training process while also highlighting the limitations pointed out above. In addition, as the thesis explores education and training in a global industry involving issues of multi-nationality, the findings can also be of interest for practitioners in other industries with a similar globalised and multinational context.

## 9.5 Recommendations

It is evident from the findings of this research that there are quite a number of shortcomings to the current MET system. These can be attributed to policy requirements, implementation and also the roles played by industry stakeholders. These factors all need to be addressed in one way or another in order to enhance the quality of training and bridge the ‘knowing-doing’ gap. Some of the shortcomings are already known to the industry but there are some findings which are unique to this research and it is on these that the following recommendations are based.

With regards to maritime policy, it is recommended that the STCW Convention be revisited and archaic subjects such as celestial navigation (see 6.3.1) be removed. Training time could be used in a more productive way by substituting obsolete practices with subjects that address the present needs of the industry. A proactive approach could be taken in identifying the industry’s future needs and practices and including these in the provisions of the training. Examples of topics that could be included are new propulsion systems, marine gas engines, and the increasing use of electronics on board ships.

It is also recommended that the duration of on-board training for officer cadets is increased to give them sufficient time, not only to develop their skills but also to develop their professional identities within the actual workplace. Having said that, increasing the time per se would not have a significant effect unless other factors discussed in this thesis that undermine on-board training are also addressed. These include the apparent gap in social and cultural knowledge in the contemporary multi-national labour force. If team-working and the development of skills and competency in the community of practice are to be effective, this issue needs to be addressed by additional policy measures such as their inclusion in the core of the training curriculum.

While examining the applicability of cognitive apprenticeship on board ships, it was found that officers were being cast in the role of mentor without the necessary teaching skills to make this model of training effective. This issue has not been addressed in the STCW Convention and it is recommended that if on-board training is to be enhanced, relevant training for all officers should be designed and included.

One of the findings of this research, discussed earlier in this chapter, concerns the lack of a systematic method of monitoring the practical training of the officers preparing for their CoC qualifications. It is recommended that the STCW provisions include the introduction of a training record book as a uniform method of monitoring skills development for officers, similar to that currently used for cadets. This practice has already been introduced in the tanker and gas tanker sectors by INTERTANKO and SIGTTO, is being implemented by some pioneer companies for their workforces (see 8.5.3.4), and could usefully be extended to the whole industry.

Even the best set of regulations, to be successful, need to be implemented properly and uniformly. This remains the responsibility of each country's maritime administration who need to put in appropriate measures to ensure that this is the case.

Most of the ship owners' responsibilities in supporting the education and training of the workforce set out in the STCW Convention are advisory, rather than mandatory, in nature. It is recommended that the STCW Convention should have more stringent provisions and greater power to make the ship owners comply with its terms.

The policy recommendations listed above contain the proposal that the STCW Convention should set out provisions for the training of officers in teaching and mentoring skills. It is recognised that such a proposal could take time to come into effect. Therefore, it is recommended that in the meantime the training institutes could develop and dispatch training instructions for the use of shipboard officers who are involved in the mentoring of cadets during their sea-phase training.

In addressing the role of the industry, the research findings indicate that the ship owners can play a large role in improving the quality of the workforce's training, not only through investment or participation in the MET, but also by facilitating an adequate on-board environment for the training of officer cadets as well as officers. The ship owners should take responsibility for establishing and implementing appropriate training instructions and procedures for shipboard training and make the officers accountable for mentoring officer cadets as well as providing peer mentoring.



In the discussion regarding the application of the cognitive apprenticeship model of training, time and teaching skills were identified as determinants that influenced the quality of training. The work intensification of the officers has made it more difficult for them to fulfil a mentoring role and a lack of knowledge of how to teach has also been identified. Moreover, one of the research findings discussed above revealed a problem with the monitoring and assessment of shipboard training. The findings show these issues were considered to be less of a problem when designated training officers were on board ship as such an arrangement would address these factors. It is therefore recommended that the role of the designated training officer on board ship be revived. Such a move would require the support of ship owners. However, the education and training and overall competency of the officers is a matter of global concern and needs a global solution. For this reason, it would be a disproportionate allocation of responsibilities for ship owners to bear the full burden. Hence, it is proposed that in order to partially compensate for the expenses such an arrangement may impose on the ship owners, the policy makers could create a mechanism whereby such expenses would be distributed and shared in a proportionate manner. The literature shows that such incentives exist in various forms such as tonnage tax and SMarT and have had some success in persuading the ship owners to participate in training programmes for the workforce (see Gekara 2008 and Gould 2010). What is proposed here are alternative incentives, such as reduced taxes and port dues, which would be provided by the port authorities of the ports of call whenever a ship owner took steps to provide cadet berths, sailed into different ports while having cadets on board or had designated training officers on their crew lists.

A further suggestion is that maritime colleges could be ranked, as is currently the case for universities, and the rankings published. This could encourage collaboration among colleges and thereby raise standards (see Lewarn 2001). It is also recommended that graduates should be graded and their grades should appear on their certificates. The benefits of such a move would be manifold, having advantages for the officers and the MET system as well as for the industry. Students would be encouraged to strive for better marks rather than simply aiming

for the pass mark<sup>91</sup>, in the knowledge that a higher grade would enhance their job opportunities. The ship owners' task of selecting top ranking employees would be easier as they would be able to judge the standard of a potential employee from their certificate. Furthermore, inspectors such as PSC would have a better idea of the quality of people they were dealing with.

A final recommendation concerns the design of course curricula and how it is delivered. An awareness of the learning theories among college course designers would ensure that the most appropriate models of learning are used in order to meet the changing needs of the industry, rather than falling back on traditional methods which are no longer appropriate. It may be necessary to redesign the methodology so the various stages required to properly implement a particular model of learning are consciously included within the planning of courses and training.

## **9.6 Reflections on the Limitations of this Study**

In the methodology chapter (section 4.10), I broadly described the difficulties which I anticipated could impose some limitations on this study. In common with other doctoral theses, the limitations were of a practical nature associated with time and financial constraints. Additionally, I faced some other difficulties unique to this research which are detailed below.

Having interviewed the shipping companies, the data generated from the interviews revealed a correlation between the size of the company and the extent of the perceived skills and competency gap of their workforce. As they had less to invest in the education and training of their workforce, the smaller companies faced more problems. In hindsight, had I been able to obtain access to more of the smaller shipping companies, the data could have been enriched by

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<sup>91</sup> See 6.3.2, 7.2.2, 8.3.1.2 and 8.5.1.1

the inclusion of their accounts where the problems of the competency of the workforce were more concentrated.

An unforeseen issue was the major changes made to the STCW Convention during the course of my research that obliged me to schedule a second stage of interviews. This caused two issues. The first was the extended time needed to complete this research with the attendant financial implications. However, through careful management of resources, I was able to overcome these difficulties. Secondly, I intended to re-interview the same stakeholders but the ship owners and officers felt it was too early for them to assess the impact of the new training arrangements. The only group who took part in the second stage interviews were the trainers who were at the forefront of the implementation of the new training provisions so were able to reflect on the changes. I perceive that if ship owners and officers could have participated in the second stage of interviews, the quality of data would have been enriched. Further research in years to come could reveal whether there are changes in the perceptions of the ship owners and officers with regard to the effectiveness of the new training provisions in bridging the competency gaps identified in this research.

Having worked on board ship for more than twenty years and having embarked on this research with the ambition of answering long-held questions, I was conscious of the risk of allowing my own perceptions to influence the research process. Although it would have been impossible to divorce myself from my background when conducting interviews, analysing data and writing up, I am confident that an awareness of this issue, together with the adoption of a systematic analysis method, mitigated against such a risk. However, it is acknowledged that the potential of such a risk always exists.

## **9.7 Further Research**

This research has been restricted by both the boundaries imposed when initially defining the scope of the study and by the limitations described above that arose during the course of the work. The areas that I was unable to look at in this research, either through choice or accident, may provide potential avenues of exploration for other researchers in the field. Some areas of

further research have already been identified in the above discussion, while others are proposed below.

At the outset of this research, the scope of the study was limited to examining the skills and competency gap of the merchant ship officers working on board ocean-going ships. However, there are many categories of seafarers working in different sectors that are not included in this study. Examples include ratings of merchant ships and seafarers working on board fishing vessels and vessels operating on near-costal voyages. The research question could be extended to include these groups in order to gain a more holistic picture of the skills and competency of seafarers and perhaps identify examples of good practice that could be extended to the rest of the industry.

Although some examples which specify the nature of the gaps in the domains of knowledge and practice are provided in the thesis<sup>92</sup>, the details of the specific gaps in both domains have not been exhaustively identified. Further research could be undertaken to flesh out the details of the specific issues that constitute both the knowledge and practice gaps by intensive scrutiny of the training policy documents. As stakeholders may be unable to recall such detail in interview, without careful thought and preparation, it is suggested that quantitative research in the form of a comprehensive questionnaire, based on documentary analysis and combined with interviews, would be an appropriate method of obtaining this data.

The term ‘quality’, used in the shipping industry, connotes a variety of meanings (see for example Leong 2012). It has “a rather complex and slippery nature” (Leong 2012, p. 121). I experienced the same in my research. Stakeholders referred to ‘quality of intakes’, but none were able to offer a clear definition of what they meant by the term. All appeared to relate the ‘quality’ of trainees to their capacity to absorb knowledge in a short period of time, although it was unclear whether this was a judgement based on their own perceptions and whether they

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<sup>92</sup> See 5.3.5, 6.3.1, 6.3.2, 7.3.4

used any criteria to form this assessment (see Abila 2016). The notion of ‘quality of intakes’ and how it is assessed is an issue that needs further investigation.

Research is needed to assess what type of knowledge and skills are needed in future for officers to cope with the emerging new technologies on board ships, for example marine gas engines and new propulsion systems. However, to understand the depth and breadth of knowledge and skills required would necessitate an investigation into the shipping companies’ future strategies regarding shipboard operation and maintenance. Whether the shipping companies intend to have maintenance-free ships, where the officers have only an ‘operator’ role or whether they require the officers to carry out their traditional roles, will determine the future of the MET. The outcome of such research would help policy makers proactively update the STCW Convention and the training providers prepare to meet the future needs of the industry.

## **Afterword**

The merchant ship officers’ competency gap needs to be addressed if the safety of shipping is to be enhanced. This cannot be achieved by one party but requires the collective determination and action of the many stakeholders who play a role in maritime education and training - from officers and trainers to ship owners and policy makers. Only through such joint endeavour will there be a truly ‘fit for purpose’ workforce who can play their part in providing profitable shipping operations, safer ships and cleaner oceans.

# Bibliography

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Abila, S. S. 2016. *The occupational socialisation of merchant marine cadets in the Philippines*. PhD Thesis, Cardiff University.

Alderton, T., Bloor, M., Kahveci, E., Lane, T., Sampson, H., Thomas, M., Winchester, N., Wu, B. and Zhao, M. 2004. *The global seafarer: living and working conditions in a globalised industry*. London: International Labour Office.

Alderton, T. and Winchester, N. 2002. Globalisation and de-regulation in the maritime industry. *Marine Policy* 26, pp. 35-43.

Alop, A. 2004. Education and training or training contra education? *Proceedings of the 13th International Conference on Maritime Education and Training (IMLA 13)*. St Petersburg, 14-17 September 2004, pp. 5-12.

Anand, N. 2011. *New technologies, work skills and identity*. PhD Thesis, Cardiff University.

Anderson, P. 2015. *The ISM code: a practical guide to the legal and insurance implications*. 3<sup>rd</sup> ed. Oxford and New York: Informa Law by Routledge.

Aristotle, 350 B.C.E. *The Nicomachean ethics: Book II*. Translated from the Greek by W. D. Ross. Oxford: Clarendon Press.

Arksey, H. and Knight, P. 1999. *Interviewing for social scientists*. London: Sage.

Atkinson, P., Coffey, A. and Delamont, S. 2003. *Key themes in qualitative research: continuities and changes*. Walnut Creek, Calif: AltaMira Press.

Bailey, N., Housley, W. and Belcher, P. 2006. Navigation, interaction and bridge team work. *The Sociological Review* 54(2), pp. 342-362.

Baillie, D. 1997. Concepts, skills and competence in a maritime setting. In: Zade, G. *Maritime education and training: a practical guide*. London: The Nautical Institute, pp. 16-22.

Baker, C. C. and Seah, A. K. 2004. Maritime accidents and human performance: the statistical trail. *MARTECH Conference*. Singapore. 22–24 September, 2004. Available at: <https://www.eagle.org/eagleExternalPortalWEB/ShowProperty/BEA%20Repository/References/Technical%20Papers/2004/MaritimeAccidentsHumanPerformance> [Accessed 20 October 2016].

Bakker, A., Hoyles, C., Kent, P. and Noss, R. 2006. Improving work processes by making the invisible visible. *Journal of Education and Work* 19, pp. 343-361.

Barbour, R. S. 2014. *Introducing qualitative research: a student's guide*. 2<sup>nd</sup> ed. London; Los Angeles, London: SAGE.

Bassey, M. 1999. *Case study research in educational settings*. Buckingham: Open University Press.

Baszanger, I. and Dodier, N. 1997. Ethnography: relating the part to the whole. In: Silverman, D. ed. *Qualitative research: theory, method and practice*. London: Sage, pp. 8-23.

Bhattacharya, S. 2009. *The impact of the ISM code on the management of occupational health and safety in the maritime industry*. PhD Thesis. Cardiff University.

Berg, N., Storgård, J. and Lappalainen, J. 2013. *The impact of ship crews on maritime safety*. Turku, Finland: Publications of the Centre for Maritime Studies, University of Turku. Available at: [http://www.merikotka.fi/cafe/images/stories/Berg\\_TheImpactOfShipCrewsOnMaritimeSafety.pdf](http://www.merikotka.fi/cafe/images/stories/Berg_TheImpactOfShipCrewsOnMaritimeSafety.pdf) [Accessed: 24 July 2015].

Berger, P. and Luckman, T. 1967. *The social construction of reality: a treatise in sociology of knowledge and commitment in American life*. New York: Anchor.

Berryman, S. E. 1991. Designing effective learning environments: cognitive apprenticeship models. *IEE Brief* 1, September 1991. Available at: <http://files.eric.ed.gov/fulltext/ED337689.pdf>. [Accessed: 7 March 2016]

Billett, S. 2010. *Learning through practice: models, traditions, orientations and approaches*. Netherlands: Springer.

BIMCO. 1996. *The practical implications of the STCW Convention; BIMCO Shipping Training Courses, in association with WMU*. Copenhagen: BIMCO Publications.

BIMCO/ICS. 2015. *Manpower Report 2015*. London: Marisec Publications.

Bleakley, A. 2002. Pre-registration house officers and ward-based learning: a 'new apprenticeship' model. *Medical education* 36(1), pp. 9-15.

Bloor, M., Sampson, H. and Gekara, V. 2013. Global governance of training standards in an outsourced labor force: the training double bind in seafarer license and certification assessments. *Regulation & Governance* 8, pp. 455-471. doi:10.1111/regg.12042

Bobb, J. 2000. Evaluating STCW practical demonstrations: what do I need? *Proceedings of the Marine Safety Council* 57(1), pp. 4-7.

Boisson, P. 1999. *Safety at sea: policies, regulations and international law*. Available at: <http://www.imo.org/en/KnowledgeCentre/ReferencesAndArchives/HistoryofSafetyatSea/Documents/P.%20Boisson%20History%20of%20safet%20at%20sea%20extract.htm> [Accessed: 17 February 2014]

Bowen, G. A. 2008. Naturalistic inquiry and the saturation concept: a research note. *Qualitative research* 8(1), pp. 137-152.

Bowman, B., Bowman, G. and Resch, R. 1984. Humanizing the research interview. *Quality and Quantity* 18, pp. 159-171.



Boyatzis, R. E. 1982. *The competent manager: a model for effective performance*. London: Wiley.

Braun, V. and Clarke, V. 2013. *Successful qualitative research: a practical guide for beginners*. London: SAGE Publications.

Brown, J. S., Collins, A. and Duguid, P. 1989. Situated cognition and culture of learning. *Educational Researcher* 18(1), pp. 32-42.

Bryman, A. 2001. *Social research methods*. Oxford: Oxford University Press.

Bryman, A. 2004. *Social research methods*. 2<sup>nd</sup> ed. Oxford: Oxford University Press.

Bryman, A. 2012. *Social research methods*. 4<sup>th</sup> ed. Oxford: Oxford University Press.

Bryman, A. 2016. *Social research methods*. 5<sup>th</sup> ed. Oxford: Oxford University Press.

Buckman, G. 2005. *Global trade: past mistakes, future choices*. London: Zed Books.

Button, K. J. 1993. *Transport economics*. Aldershot: Edward Elgar.

Cafruny, A. 1987. *Ruling the waves - the political economy of international shipping, studies in international political economy*. Berkeley, CA: University of California Press.

Cahill, R. A. 1990. *Disasters at sea: Titanic to Exxon Valdez*. London: Century.

Cahoon, S. C. 2009. Attracting generations Y and M to seafaring. *The International Maritime Human Element Bulletin* 19, p. 6.

Carlisle, R. 1981. *Sovereignty for sale: the origins and evolution of the Panamanian and Liberian flags of convenience*. Annapolis, Md: Naval Institute Press.

Chapman, P. K. 1992. *Trouble on board: the plight of international seafarers*. New York: ILP Press.

Chapman, S. E. 1997. The development and implementation of the 1995 STCW Convention. In: Zade, G. *Maritime education and training: a practical guide*. London: The Nautical Institute, pp. 154-159.

Christians, C. G. 2000. Ethics and politics in qualitative research. In: Denzin, K. and Lincoln, S. eds. *Handbook of qualitative research*. 2<sup>nd</sup> ed. California: Sage Publications Inc, pp. 133-155.

Cicek, I., Deniz, C. and Kusoglu, A. 2002. A comparative study of training methods for training and education of marine engineering students of IAMU universities. *The Second General Assembly of IAMU Proceedings*. Kobe; Japan, 2-5 October 2001, pp. 17-24.

Cicek, I. and Er, I. D. 2008. Economic constraints on maritime training and education in Turkey. *TransNav* 2(2), pp. 193-196. Available at: [http://www.transnav.eu/Article\\_Economic\\_Constraints\\_on\\_Maritime\\_Cicek,6,93.html](http://www.transnav.eu/Article_Economic_Constraints_on_Maritime_Cicek,6,93.html) . [Accessed: 5 March 2016].

Clark, C. S., Dobbins, G. H. and Ladd, R. T. 1993. Exploratory field study of training motivation. *Group & Organization Management* 18 (3), pp. 292-307.

Cleaver, T. 1997. *Understanding the world economy: global issues shaping the future*. London: Routledge.

Clench, R. S. 1995. The human component in maritime systems. In: Yakimiuk, P and Erripidou, A.L. eds. *IMAS'95 Conference & proceeding: Vol. 107(2). Management and operation of ships: practical techniques for today and tomorrow*. London: Institute of Marine Engineers, pp. 193-198.

Cockroft, D. 2003. IMO - the economics of intimidation. *Maritime Policy and Management* 30(3), pp. 195-196.

Coffey, A. and Atkinson, P. 1996. *Making sense of qualitative data*. Thousand Oaks, CA: Sage Publications.

Collins, A. 1991. Cognitive apprenticeship and instructional technology. In: Idol, L. and Jones, B. F. eds. *Educational values and cognitive instruction: implications for reform*. Hillsdale, NJ: Lawrence Erlbaum Associates, pp. 121-138.

Collins, A., Brown, J. S. and Newman, S. E. 1989. Cognitive apprenticeship: teaching the crafts of reading, writing, and mathematics. In: Resnick, L.B. ed. *Knowing, learning, and instruction: essays in honor of Robert Glaser*. New Jersey, Lawrence Erlbaum Associates Inc., pp. 453-494.

Collins, A., Brown, J. S. and Holum, A. 1991. Cognitive apprenticeship: making thinking visible. *American educator* 15(3), pp. 6-11.

Couper, A. 1999. *Voyages of abuse: seafarers, human rights and international shipping*. London: Pluto.

Couper, A. 2000. Implications of maritime globalization for the crews of merchant ships. *Journal for Maritime Research* 2(1), pp. 1-8. doi: 10.1080/21533369.2000.9668303.

Creswell, J. W. 1998. *Qualitative inquiry and research design: choosing among five traditions*. Thousand Oaks, CA: Sage Publications.

Crewtoo. 2017. *Seafarers want training that reflects their needs*. Available at: <http://www.crewtoo.com/crew-life/rules-regs/seafarers-want-training-that-reflects-needs/> [Accessed: 17 July 2017].

Crotty, M. 1998. *The foundation of social research: meaning and perspectives in the research process*. London: Sage.

Dacanay, J. 2015. Updates on STCW Implementation. *John B. Lacson Foundation Maritime University Maritime Journal*, pp. 12-18.

Daniels, P. W. and Lever, W. F. 1996. *The global economy in transition*. Harlow: Longman.

Darling-Hammond, L., Austin, K., Orcutt, S. and Rosso, J. 2001. *How people learn: introduction to learning theories. The Learning Classroom: Theory into Practice*. Stanford University. Available at: <https://web.stanford.edu/class/ed269/hplintrochapter.pdf> [Accessed: 1 August 2015].

Dasgupta, B. 1998. *Structural adjustment, global trade and the new political economy of development*. London: Zed Books.

Delamont, S. 1992. *Fieldwork in educational settings: methods, pitfalls and perspectives*. London: Falmer Press.

Deloitte. 2011. *Challenge to the industry: securing skilled crews in today's marketplace*. Available at: <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/dttl-er-challengeindustry-08072013.pdf> [Accessed: 28 January 2016].

Demirel E and Mehta R. 2009. Developing an effective maritime education and training system - TUDEV experiment, *IMLA Conference*, Accra, Ghana, 07-10 September 2009. Available at: [http://www.marifuture.org/publications/papers/developing\\_an\\_effective\\_maritime\\_education\\_and\\_training\\_system\\_imala\\_2009.pdf](http://www.marifuture.org/publications/papers/developing_an_effective_maritime_education_and_training_system_imala_2009.pdf) [Accessed: 15 February 2015].

Dennen, V. P. and Burner, K. J. 2008. The cognitive apprenticeship model in educational practice. In: Spector, J. M. et al. eds. *Handbook of educational communications and technology*. Mahwah; NJ: Erlbaum, pp. 425-439.

Denzin, K. and Lincoln, S. 1994. *Handbook of qualitative research*. Thousand Oaks, California: Sage Publications.

Denzin, K. and Lincoln, S. 1998. Methods of collecting and analysing empirical materials. In: Denzin, K. and Lincoln, S. eds. *Collecting and Interpreting Qualitative Materials*. London: Sage, pp. 35-46.

Denzin, K. and Lincoln, S. 2000. Introduction: the discipline and practice of qualitative research. In: Denzin, K. and Lincoln, S. eds. *Handbook of Qualitative Research*. 2<sup>nd</sup> ed. London: Sage Publications, pp. 1-28.

DeSombre, E. R. 2000. Flags of convenience and the enforcement of environmental, safety and labour regulations at sea. *International Politics* 37(2), pp. 213-232.

De Vaus, D. A. 2001. *Research design in social research*. London: Sage.

Dev Gupta, S. 2015. Comparative advantage and competitive advantage: an economics perspective and a synthesis. *Athens Journal of Business and Economics* January, pp. 9-22.

Dewey, J. and Dewey, E. 1915. *Schools of To-morrow*. New York: E.P. Dutton & Company.

Dey, I. 1993. *Qualitative data analysis: a user friendly guide for social scientists*. London: Routledge.

Donn, C. 2002. Two-tiered employment in the global economy. *Le Moyne College Working Paper Series, WP2002-002*. Memphis: The World Maritime Industry Management Division.

Dong, W. H. 2014. Research on maritime education and training in China: a broader perspective. *TransNav, the International Journal on Maritime Navigation and Safety of Sea Transportation* 8(1) pp. 115-120. doi: 10.12716/1001.08.01.13

Dornan, T., Boshuizen, H., King, N. and Scherpbier, A. 2007. Experience-based learning: a model linking the processes and outcomes of medical students' workplace learning. *Medical education* 41(1), pp. 84-91.

Drewry Maritime Research. 2015. *Manning annual report 11 June 2015*. London: Patrick Neylan.

Duguid, P. 2005. "The art of knowing": social and tacit dimensions of knowledge and the limits of the community of practice. *The Information Society* 21(2), pp. 109-118. doi: 10.1080/01972240590925311

EASME. 2016 *Study supporting a possible network of maritime training academies and institutes in the Mediterranean Sea basin: final report*. Available at: [https://webgate.ec.europa.eu/maritimeforum/sites/maritimeforum/files/Maritime%20Academies%20-%20Final%20Report%20and%20annexes\\_template%20EC\\_0.PDF](https://webgate.ec.europa.eu/maritimeforum/sites/maritimeforum/files/Maritime%20Academies%20-%20Final%20Report%20and%20annexes_template%20EC_0.PDF) [Accessed: 13 February 2017].

Ellis, N., Sampson, H., Aguado, J. C., Baylon, A., Del Rosario, L., Lim, Y. F. and Veiga, J. 2005. *What seafarers think of CBT*. Available at: <http://www.sirc.cf.ac.uk/Uploads/In%20House/CBT%20Report.pdf> [Accessed: 27 April 2014].

Emad, G. R. 2011. *Rethinking adult and vocational education: hauling in from maritime domain*. PhD Thesis, University of Victoria.

Emad, G. and Oxford, I. 2008. Rethinking maritime education and training. *Proceedings of the 16th International Maritime Lecturers Association Conference*. Izmir, Turkey, 14-17 October, 2008. Available at: <http://web.deu.edu.tr/maritime/imla2008/Papers/12.pdf> [Accessed: 7 May 2016]

Emad, G. and Roth, W-M. 2008. Contradictions in the practices of training for and assessment of competency: a case study from the maritime domain. *Journal of Education + Training* 50(3), pp. 260–272.

EMSA. 2014. *European Maritime Safety Agency facts and figures 2014*. Available at: [www.emsa.europa.eu/emsa-documents/download/3671/2494/23.html](http://www.emsa.europa.eu/emsa-documents/download/3671/2494/23.html) [Accessed: 3 March 2017].

Er, Z. and Celik, M. 2005. Definitions of human factor analysis for the maritime safety management process. In: Nielsen, D. ed. *Maritime security and MET: Proceedings of the International Association of Maritime Universities (IAMU) 6<sup>th</sup> Annual General Assembly and Conference, World Maritime University, Malmo, Sweden*. Southampton: WIT Press, pp. 235-243.

ETF. 2011. *How to enhance training and recruitment in the shipping industry in Europe*. Available at: <http://www.etf-europe.org/files/extranet/-75/33460/Brochure%20recrut.pdf> [Accessed: 26 April 2015].

Evangelos, T. [no date]. *Language barriers and miscommunication as a cause of maritime accidents*. Dissertation, Merchant Marine Academy of Macedonia.

Eyerdam, R. 2015. Simulation: mind the gap. *Maritime Professional* 5(2), pp. 52-54.

Fielding, N. and Thomas, H. 2001. Qualitative interviewing. In: Gilbert, N. ed. *Researching Social Life*. 2<sup>nd</sup> ed. London: Sage, pp. 123-144.

Fink, E. J. 2001. Point of view. *Proceedings of the Marine Safety Council* 58(4), pp. 4-5.

Fisher, S. L. 2014. *Understanding the impact of motivation on the effectiveness of various content delivery methods in training program development: a mixed methods evaluation*. Doctoral dissertation, Louisiana State University.

Flick, U. 2014. *An introduction to qualitative research*. 5<sup>th</sup> ed. London: Sage Publications.

Flick, U., von Kardorff, E. and Steinke, I. eds. 2004. *A companion to qualitative research*. London: Sage.

Fonseca, J. R. 2014. Training to prevent marine accidents and deaths. *Marine Technology News* 24 June. Available at: <http://www.marinetechologynews.com/news/training-prevent-marine-accidents-494801> [Accessed: 26 April 2016].

Fontana, A. and Frey, J. H. 1998. Interviewing: the art of science. In: Denzin, K. and Lincoln, S. eds. *Collecting and interpreting qualitative materials*. London: Sage, pp. 47-78.

Forester, J. 1993. *Critical theory, public policy, and planning practice: toward a critical pragmatism*. Albany: State University of New York Press.

Forward, K. 2004. *Tanker operations training*. Available at: <http://www.tankeroperator.com/pastissues/2004%20March/TO2004March%20p21-24%20Tanker%20operations%20training.pdf> [Accessed: 28 July 2016].

Frankel, E. G. 1992. Hierarchical logic in shipping policy and decision-making. *Maritime Policy and Management* 19(3), pp. 211-221.

Fraunhofer. 2013. *Best practice ship management study*. Available at: <http://www.cml.fraunhofer.de/content/dam/cml/de/documents/Studien/Best-practice-Studie-2013.pdf> [Accessed: 13 February 2016].

Frey, J. H. and Oishi, S. 1995. *How to conduct interviews by telephone and in person*. Thousand Oaks: Sage.

Fuazudeen, M. 2008a. Seafarers' training and the comprehensive review of the STCW Convention and STCW code. *16<sup>th</sup> IMLA (International Maritime Lecturers Association) Conference Proceedings*. Dokuz Eylül University, Izmir, Turkey, 14-17 October 2008. Dokuz Eylül Publications.

Fuazudeen, M. 2008b. The human element - an IMO perspective. *SAFEMED Project. Seminar on the Human Influence in Maritime Accidents*. Lisbon, Portugal, 17-19 June, 2008. Available at: <http://www.euromedtransport.org/En/image.php?id=2468> [Accessed: 15 September 2015].

Fuller, A. and Unwin, L. 2003. Fostering workplace learning: looking through the lens of apprenticeship. *European Educational Research Journal* 2(1), pp. 41-55.

Fuller, A. and Unwin, L. 2011. Apprenticeship as an evolving model of learning. *Journal of Vocational Education & Training* 63(3), pp. 261-266.

Gall, M. D., Borg, W. R. and Gall, J. P. 1996. *Educational research: an introduction*. 6<sup>th</sup> ed. White Plains, N.Y.: Longman.

Gardner, B., Naim, M., Obando-Rojas, B. and Pettit, S. 2001. Maintaining the maritime skills base: does the Government have a realistic strategy? *Maritime Policy and Management* 28(4), pp. 347-360.



Gaskell, G. 2000. Individual and group interviewing. In: Bauer, M. and Gaskell, G. eds. *Qualitative researching with text, image and sound: a practical handbook*. London: Sage, pp. 38-56.

Gekara, V. O. 2008. *Globalisation, state strategies and the shipping labour market*. PhD Thesis, Cardiff University.

Gentry, J. W. 1990. What is experiential learning? In: Gentry, J. W. ed. *Guide to business gaming and experiential learning*. New York: Nichols/GP Publishing, pp. 9-20.

Ghefaili, A. 2003. Cognitive apprenticeship, technology, and the contextualization of learning environments. *Journal of Educational Computing, Design & Online Learning* 4(1), pp. 1-27.

Ghosh, S., Bowles, M., Ranmuthugala, D. and Brooks, B. 2014. Reviewing seafarer assessment methods to determine the need for authentic assessment. *Australian Journal of Maritime & Ocean Affairs* 6(1), pp. 49-63.

Gibbs, G. 1988. *Learning by doing: a guide to teaching and learning methods*. London: Further Education Unit.

Giddens, A. 2002. *Runaway world: how globalisation is reshaping our lives*. 2<sup>nd</sup> ed. London: Profile.

Gorard, S. 2013. *Research design: creating robust approaches for the social sciences*. London: Sage.

Gould, E. 2010. *Towards a total occupation: a study of UK Merchant Navy officer cadetship*. PhD Thesis, Cardiff University.

Goulielmos, A. M. 1997. An emergency decision support system on line for captains. *Proceedings of Marine Risk Assessment: A Better Way to Manage Your Business*. London, 8-9 April 1997. The Institute of Marine Engineers.

Gray, D. E. 2004. *Doing research in the real world*. London: Sage Publications.

Greiner, R. 2015. Shipping under pressure. *Maritime Logistics Professional* (1Q 2015 edition). Available at:  
<https://www.maritimeprofessional.com/magazine/story/201503/shipping-under-pressure-488172> [Accessed: 14 February 2016].

Greiner, R. 2016. Ship operating costs to increase for 2016 & 2017, Moore Stephens says. *Safety4Sea* 1 November 2016. Available at: <https://www.safety4sea.com/ship-operating-costs-to-increase-for-2016-2017-moore-stephens-says/> [Accessed: 14 February 2017].

Grove, T. W. 1989. US flag ship of future: concepts, features and issues. *The Society of Naval Architects and Marine Engineers. Spring Meeting/STAR Symposium*. New Orleans, Louisiana, 12-15 April. SNAME. Available at:  
<http://www.sname.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=a77ced34-abff-42fe-8041-5b28ba7b0154>. [Accessed: 18 March 2016].

Guadalupe, C. 2010. *Teachers as primary agents of educational systems*. Available at:  
<http://www.focal.ca/publications/focalpoint/259-june-2010-cesar-guadalupe-en>. [Accessed: 9 November 2016].

Guile, D. and Young, M. 2001. Apprenticeship as a conceptual basis for a social theory of learning. In Paechter, C. et al. eds. *Knowledge, Power and Learning*. London: Paul Chapman Publishing, pp.56-73.

Guthrie, H. 2009. *Competence and competency-based training: what the literature says*. Adelaide: National Centre for Vocational Education Research.

Hager, P. 2004. The competence affair, or why vocational education and training urgently needs a new understanding of learning. *Journal of Vocational Education and Training* 56(3), pp. 404–433.

Hakim, C. 1993. Research analysis of administrative records. In: Hammersley, M. ed. *Social research: philosophy, politics and practice*. London: Sage Publications, pp. 131-145.

Hammersley, M. and Atkinson, P. 1995. *Ethnography*. 2<sup>nd</sup> ed. London: Routledge.

Hanzu-Pazara, R., Popescu, C. and Varsami, A. 2012. The role of teamwork abilities and leadership skills for the safety of navigation. *The 13th Annual General Assembly of the IAMU: Expanding Frontiers - Challenges and Opportunities in Maritime Education and Training*. St. John's, Newfoundland and Labrador, Canada, 15<sup>th</sup>-17<sup>th</sup> October, 2012, pp. 317-326. Available at: <http://iamu-edu.org/wp-content/uploads/2014/07/The-role-of-teamwork-abilities-and-leadership-skills-for-the-safety-of-navigation.pdf>. [Accessed: 15 July 2016].

Hardin, D. 2000. By the way ... Editor's point of view. *Proceedings of the Marine Safety Council* 57(1), p. 3.

Harris, R., Guthrie, H., Hobart, B. and Lundberg, D. 1995. *Competency-based education and training: between a rock and a whirlpool*. Melbourne: Macmillan Education.

Hartle, F. 1995. *How to re-engineer your performance management process*. London: Kogan Page.

Held, D. and McGrew, A. 2002. *Globalisation/anti-globalisation*. Oxford: Polity Press.

Held, D., Goldblatt, D., McGrew, A. and Perraton, J. 1999. *Global transformations: politics, economics and culture*. Cambridge: Polity Press.

Herrington, J. and Oliver, R. 1995. Critical characteristics of situated learning: implications for the instructional design of multimedia. *Proceedings of ASCILITE95 Conference*. University of Melbourne, Australia. 3-7 December, 1995. Available at: <http://www.ascilite.org/conferences/melbourne95/smtu/papers/herrington.pdf> [Accessed: 5 March 2016].

Hill, J. M. M. 1972. *The seafaring career: a study of the forces affecting joining, serving and leaving the merchant navy*. London: Centre for Applied Social Research, Tavistock Institute of Human Relations.

Hirst, P. and Thompson, G. 1992. The problem of 'globalisation': international economic relations, national economic management and formation of trading blocks. *Economy and Society* 21(4), pp. 357-396.

Hirst, P., Thompson, G. and Bromley, S. 2009. *Globalization in question*. 3<sup>rd</sup> ed. Cambridge: Polity Press.

Horck, J. 2006. *A mixed crew complement: a maritime safety challenge and its impact on maritime education and training*. Malmö, Sweden: Jan Horck, Malmö University.

Huddleston, P. 1998. Modern apprentices in college: 'something old, something new'. *Journal of Vocational Education and Training* 50(2), pp. 277-290.

Hughes, D. 2017. Philippines maritime training schools to be inspected by EMSA in March. *Fairplay* 6 February 2017. Available at: <http://fairplay.ihs.com/safety-regulation/article/4281636/philippines-maritime-training-schools-to-be-inspected-by-emsa-in-march> [Accessed: 20 May 2017].

Hughes, J. and Sharrock, W. 1997. *The philosophy of social research*. London: Longman.

Hummel, H. G. K. 1993. Distance education and situated learning: paradox or partnership? *Educational Technology* 33(12), pp. 11-22.

Hutchins, E. 1995. *Cognition in the wild*. Cambridge, Mass: MIT Press.

Hyland, T. 1994. *Competence, education and NVQs: dissenting perspectives*. London: Cassell.

IAMU. 2014. *Maritime safety and security: MARSAs - enhancing safety awareness of the maritime personnel*. Tokyo, Japan: International Association of Maritime Universities Secretary's Office.

ICS. 2017. *Shipping and world trade*. Available at: <http://www.ics-shipping.org/shipping-facts/shipping-and-world-trade>. [Accessed: 3 August 2017].

IIMS. 2014. *Unit 18: Marine incident investigation*. Hampshire: IIMS, pp. 33-34. Available at: <https://www.iims.org.uk/wp-content/uploads/2014/08/IIMS-HNC-HND-Unit18-Version1.pdf> [Accessed: 16 March 2016].

ILO. 1996. *Accident prevention on board ship at sea and in port*. Geneva, Switzerland: ILO Publications.

ILO. 2006. *International Labour Organisation*. Available at: <http://www.ilo.org/inform/online-information-resources/research-guides/history/lang--en/index.htm> [Accessed: 15 September 2006].

ILO. 2017. *International labour standards on seafarers*. Available at: <http://www.ilo.org/global/standards/subjects-covered-by-international-labour-standards/seafarers/lang--en/index.htm>. [Accessed: 3 August 2017].

IMCO. 1978. *International conference on training and certification of seafarers, 1978: Final act of the conference with attachments, including the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978*. London: Inter-Governmental Maritime Consultative Organisation.

IMO. 1993. *The international safety management code*. Available at: <http://www.admiraltylawguide.com/conven/ismcode1993.html> [Accessed: 15 September 2006].

IMO. 1996. *International convention on standards of training, certification and watchkeeping for seafarers, 1978, as amended in 1995, and seafarer's training, certification and watchkeeping code*. International Maritime Organization: London.

IMO. 1997. *Focus on IMO*, March 1997. Available at: <http://www.imo.org/en/OurWork/Safety/Regulations/Documents/STCW97.pdf> [Accessed: 4 January 2015].

IMO. 2000. *Crowd management, passenger safety and safety training for personnel providing direct services to passengers in passenger spaces*. London: IMO.

IMO 2001. *International convention on standards of training, certification and watchkeeping for seafarers 1978, as amended in 1995 and 1997 (STCW convention) and seafarers' training, certification and watchkeeping code (STCW code)*. London: IMO Publications.

IMO. 2005. International shipping - carrier of world trade. *World Maritime Day 2005, background paper*. Available at:  
[http://www.imo.org/en/KnowledgeCentre/ShipsAndShippingFactsAndFigures/TheRoleandImportanceofInternationalShipping/IMO\\_Brochures/Documents/World%20Maritime%20Day%202005.pdf](http://www.imo.org/en/KnowledgeCentre/ShipsAndShippingFactsAndFigures/TheRoleandImportanceofInternationalShipping/IMO_Brochures/Documents/World%20Maritime%20Day%202005.pdf) [Accessed: 21 August 2006].

IMO. 2006. *International Maritime Organisation*. Available at: [www.imo.org](http://www.imo.org) [Accessed: 7 September 2006].

IMO. 2011. *International convention on standards of training, certification and watchkeeping for seafarers, including 2010 Manila amendments: STCW convention and STCW code*. 3<sup>rd</sup> edition. London: International Maritime Organisation.

IMO. 2012. *International Maritime Organisation*. Available at: [www.imo.org](http://www.imo.org) [Accessed: 26 September 2012].

IMO. 2015. *Implementation of IMO instruments*. Available at:  
<http://www.imo.org/en/OurWork/Safety/Implementation/Pages/ImplementationOfIMOInstruments.aspx> [Accessed: 23 April 2015].

IMO. 2017. *Human element*. Available at:  
<http://www.imo.org/en/OurWork/HumanElement/Pages/Default.aspx> [Accessed: 20 February 2017].

Kahveci, E. 1999. *Fast turnaround ships and their impact on crews*. Cardiff: Seafarers International Research Centre Publications.

Kahveci, E., Lane, T. and Sampson, H. 2002. *Transnational seafarer communities*. Cardiff University: Seafarers International Research Centre Publications.

Kahveci, E. and Nichols, T. 2006. *Other car workers: work, organisation and technology in the maritime car carrier industry*. London: Palgrave Macmillan.

Kennerley, A. 2002. Writing the history of merchant seafarer education, training and welfare: retrospect and prospect. *Northern Mariner* 12(2), pp. 1-22.

Kennerley, A. 2005. Book review: the right kind of boy: a portrait of the British sea apprentice, 1830–1980. *International Journal of Maritime History* 17(1), pp. 336-338. doi.org/10.1177/084387140501700140

Kets de Vries, M. F. R., Manfred F. R., Vrignaud, P., Korotov, K., Engellau, E. and Florent-Treacy, E. 2006. The development of the personality audit: a psychodynamic multiple feedback assessment instrument. *International Journal of Human Resource Management* 17(5), pp. 898-917.

King, J. 2000. Technology and the seafarer, *Journal for Maritime Research* 2(1), pp. 48-63. doi: 10.1080/21533369.2000.9668307

Kolb, D. A. 1976. Management and the learning process. *California Management Review*, 18(3) pp. 21-31.

Kolb, D. A. 1984. *Experiential learning: experience as the source of learning and development*. New Jersey, Prentice Hall.

Kristensen, S. 1998. Transnational mobility in the context of vocational education and training in Europe. In: Cedefop. ed. *Vocational Education and Training – the European Research Field. Background Report – Volume II*. Luxembourg: Office for Official Publications of the European Communities.

Kumar, R. 1996. *Research methodology: a step-by-step guide for beginners*. London: Sage Publications.

Lane, T. 1997. Globalisation, deregulation, and crew competence in world shipping. In: McConville, J. ed. *Transport Regulation Matters*. London: Francis Pinter, pp. 98-125.

Lane, T. 1999. Flags of convenience: is it time to redress the balance? *Maritime Review*, pp. 31-35. Available at: <http://www.sirc.cf.ac.uk/uploads/publications/Flagcon.pdf> [Accessed: 17 June 2014].

Lane, T. 2000. *The global seafarers' labour market: problems & solutions*. Cardiff: Seafarers' International Research Centre, University of Wales, Cardiff.

Lane, T. 2002. Regulation and the global labour market for seafarers. *Conference Sécurité Maritime et Protection de l'Environnement: Evolution et Perspectives*, 11-13 March, 2002. Available at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.107.9312&rep=rep1&type=pdf>. [Accessed: 18 January 2014].

Lave, J. 1991. Situating learning in communities of practice. In: Resnick, L.B. et al. eds. *Perspectives on socially shared cognition*. Washington DC: American Psychological Association, pp. 63-82.

Lave, J. and Wenger, E. 1991. *Situated learning: legitimate peripheral participation*. Cambridge: Cambridge University Press.

Leca Da Veiga, J. P. F. A. 2001. *A study of the implementation of STCW 95 in the context of a safety culture in shipping*. PhD Thesis, Cardiff University.

Lechner, F. J. and Boli, J. 2004. Introduction. In: Lechner, F. J. and Boli, J. eds. *The Globalization Reader*. 2<sup>nd</sup> ed. London: Blackwell.

Le Goubin, A. L. 2010. Mentoring and the transfer of experiential knowledge in today's merchant fleet. *TransNav* 4(1), pp. 95-101. Available at: [http://www.transnav.eu/Article\\_Mentoring\\_and\\_the\\_Transfer\\_Le%20Goubin,13,209.html](http://www.transnav.eu/Article_Mentoring_and_the_Transfer_Le%20Goubin,13,209.html) [Accessed:13 February 2015].



Lewarn, B. 2001. Maritime education and training - the future is now! *Proceedings of the 2nd General Assembly of IAMU*. Kobe; Japan, 2-5 October, 2001, pp. 207-212.

Lewarn, B. 2002. Seafarer training: does the system defeat competence? *Proceedings of the Third General Assembly of the International Association of Maritime Universities*. Rockport; Maine, 23-26 September, 2002. IAMU, pp. 22-26.

Lewin, P. M. E. 2015. *Training effectiveness in maritime transport*. Master's thesis, Buskerud and Vestfold University College.

Li, L. C., Grimshaw, J. M., Nielsen, C., Judd, M., Coyte, P. C. and Graham, I. D. 2009. Evolution of Wenger's concept of community of practice. *Implementation Science* 4(1), p.11.

Liu, Z. 2001. *Identifying and reducing the involvement of human element in collisions at sea*. MSc Dissertation, World Maritime University.

Lunce, L. M. 2006. Simulations: bringing the benefits of situated learning to the traditional classroom. *Journal of Applied Education Technology* 3(1), pp. 37-45.

Magramo, M. M. and Gellada, L. D. 2013. Lived experiences of deck cadets on board. In: Weinrit, A. and Neumann, T. eds. *Marine Navigation and Safety of Sea Transportation: STCW, Maritime Education and Training (MET), Human Resources and Crew Manning, Maritime Policy, Logistics and Economic Matters*. London: Taylor and Francis Group, pp. 81-84.

Marlow, P., Pettit, S. and Bergantino, A. 1997. The decision to flag out and its impact on the national economy. In: Misztal, K. and Zurek, J. eds. *Maritime transport and economic reconstruction*. Gdansk: University of Gdansk.

Mason, J. 1996. *Qualitative researching*. London: Sage Publications.

Mason, J. 2002. *Qualitative researching*. 2<sup>nd</sup> ed. London: Sage

Maudsley, G. and Strivens, J. 2000. Promoting professional knowledge, experiential learning and critical thinking for medical students. *Medical Education* 34, pp 535-544.

Maxwell, J. A. 2005. *Qualitative research design: an interactive approach*. Thousand Oaks, CA: Sage Publications.

Metaxas, B. N. 1985. *Flags of convenience: a study of internationalisation*. Aldershot: Gower.

McConville, J. 1999. Shipping policy. *Maritime Policy and Management* 26(2), pp. 103-4.

McLellan, H. 1994. Situated learning: continuing the conversation. *Educational Technology* 34(10), pp. 7-8.

Miles, M. B. and Huberman, A. M. 1994. *Qualitative data analysis*. 2<sup>nd</sup> ed. Thousand Oaks, CA: Sage Publications.

Mitropoulos, E. E. 2005. International shipping - carrier of world trade. *IMO News* 3, pp. 4-5. Available at: [http://www.imo.org/en/MediaCentre/MaritimeNewsMagazine/Documents/2005/IMONews\\_305.pdf](http://www.imo.org/en/MediaCentre/MaritimeNewsMagazine/Documents/2005/IMONews_305.pdf) [Accessed: 17 June 2014].

Mitropoulos, E. E. 2006. Opening address. *Maritime Safety Committee (MSC), 81<sup>st</sup> session*. 10 May 2006. Available at: <http://blog.marinacivil.com/2006/05/12/el-secretario-general-de-imo-efthimios-e-mitropoulos-vuelve-a-demostrar-su-capacidad-para-interpretar-y-liderar-la-omi-su-discurso-ante-el-comite-de-seguridad-maritima-asi-lo-confirma-maritime/> [Accessed: 17 February 2014].

Moore, M. 2003. *A world without walls: freedom, development, free trade and global governance*. Cambridge: Cambridge University Press.

Moreby, D. H. 1999. Professionalisation. *Seaways: The International Journal of the Nautical Institute* July, pp. 11-12.

Morris, P. 2001. A new age of maritime employment. *Keynote Address, 4<sup>th</sup> L.S.M. Asia Pacific Manning & Training Conference*. Manila, 20 November, 2001.

MPT. 2016. *Standards of training, certification and watchkeeping*. Available at: <https://www.mptusa.com/stcw-full.cfm> [Accessed: 3 April 2016].

National Research Council. 1974. *The seagoing workforce: implications of technological change*. Washington, D.C.: Maritime Transportation Research Board, National Research Council.

National Research Council. 1990. *Crew size and maritime safety*. Washington DC: The National Academies Press. doi: 10.17226/1620.

National Research Council. 1994. *Minding the helm: marine navigation and piloting*. Washington DC: The National Academies Press. doi: 10.17226/2055

National Research Council. 1996. *Simulated voyages: using simulation technology to train and license mariners*. Washington DC: The National Academies Press. doi: 10.17226/5065

Neary, M. 2000. *Teaching, assessing and evaluation for clinical competence: a practical guide for practitioners and teachers*. Cheltenham: Stanley Thornes.

Neukrug, E. S. 2016. *Theory, practice and trends in human services: an introduction*. 6<sup>th</sup> ed. Boston, MA: Cengage Learning.

Nichols, T. 1997. *The sociology of industrial injury*. London: Mansell Publishing.

Odeke, A. 1984. *Protectionism and the future of international shipping: the nature, development, and role of flag discriminations and preferences, cargo reservations and cabotage restrictions, state intervention and maritime subsidies*. Dordrecht: Martinus Nijhoff.

O'Neil, W. A. 2001. The human element in shipping; keynote address. *Biennial Symposium of the Seafarers International Research Centre*. Cardiff, 29 June 2001.

O'Neil, W. A. 2003. The human element in shipping. *World Maritime University Journal of Maritime Affairs* 2, pp. 95-97.

Osterman, C. 2010. Essential skills for addressing human element issues in a shipping company. *Alert!* 22. p. 2.

Paixao, A. and Marlow, P. 2001. A review of the European Union shipping policy. *Maritime Policy and Management* 28(2), pp. 187-198.

Patraiko, D. 2016. Mariner feedback during the design and operation of ships and systems. *Ergoship 2016 Conference*, Melbourne, Australia, 6-7 April 2016. Available at: <http://eprints.utas.edu.au/22795/1/Ergoship%20Patraiko%202.pdf>. [Accessed: 2 February 2017].

Patton, M. Q. 1990. *Qualitative evaluation and research methods*. 2<sup>nd</sup> ed. London: Sage.

Patton, M. Q. 2002. *Qualitative research and evaluation methods*. 3<sup>rd</sup> ed. Thousand Oaks, CA: Sage Publications.

Payne, G. and Payne, J. 2004. *Key concepts in social research*. London: Sage.

Pfeffer, J. and Sutton, R. 2000. *The knowing-doing gap*. Harvard, USA.

Potter, D. 1992. Safety afloat: criminal penalties and investigations into marine casualties. *Journal of Maritime Law and Commerce* 23(4), pp. 697-619.

Prasad, R., Baldauf, M. and Nakazawa, T. 2011. Collaborative learning for professional development of shipboard engineers. *International Journal of Engineering Science and Technology (IJEST)* 3(3), pp. 2308-2319.

Psaraftis, H. N., Caridis, P., Desypris, N., Panagakos, G. and Ventikos, N. 1998. The human element as a factor in marine accidents. *IMLA-10 Conference*. St Malo; France, September 1998. Available at:

<http://citeseerx.ist.psu.edu/viewdoc/download;jsessionid=1FFD6CADB92CC7ECA4B3CBA3D100F8BA?doi=10.1.1.515.2790&rep=rep1&type=pdf> [Accessed: 17 July 2014].

Punch, K. F. 1998. *Introduction to social research: quantitative and qualitative approaches*. London: Sage.

Pyne, R. and Koester, T. 2005. Methods and means for analysis of crew communication in the maritime domain. *The Archives of Transport* 17(3-4), pp. 193-208.

Ready, N. P. 1994. *Ship registration*. 2<sup>nd</sup> ed. London: Lloyds of London Press Limited.

Resnick, L. B. ed. 1989. *Knowing, learning, and instruction: essays in honor of Robert Glaser*. New Jersey: Lawrence Erlbaum Associates, Inc.

Robson, C. 2002. *Real world research*. Oxford: Blackwell Publishing.

Rothblum, A. M. 2000. Human error and marine safety. *National Safety Council Congress and Expo*. Orlando, 13-20 October, 2000. Available at: [http://bowles-langley.com/wp-content/files\\_mf/humanerrorandmarinesafety26.pdf](http://bowles-langley.com/wp-content/files_mf/humanerrorandmarinesafety26.pdf) [Accessed: 8 May 2014].

Rubin, H. J. and Rubin, I. S. 1995. *Qualitative interviewing: the art of hearing data*. Thousand Oaks: Sage Publications.

Rubin, H. J. and Rubin, I. S. 2005. *Qualitative interviewing: the art of hearing data*. 2<sup>nd</sup> ed. London: Sage Publications Ltd.

Sadjadi Parsa, S. J. 2008. *Human resource management in the shipping industry*. London: London Metropolitan University.

Safahani, M. 2009. *Can the simulator replace on board training?* Available at: [http://www.he-alert.org/filemanager/root/site\\_assets/standalone\\_article\\_pdfs\\_0605-/HE00890.pdf](http://www.he-alert.org/filemanager/root/site_assets/standalone_article_pdfs_0605-/HE00890.pdf). [Accessed: 6 March 2016].

Salas, E., Tannenbaum, S. I., Kraiger, K. and Smith-Jentsch, K. A. 2012. The science of training and development in organizations: What matters in practice. *Psychological science in the public interest* 13(2), pp. 74-101.

Sampson, H. 2003. Equal training in an unequal world? An examination of global MET standards. *Biennial Symposium of the Seafarers International Research Centre: Proceedings of SIRC's Third Symposium*. Cardiff University: SIRC Publications, pp. 41-52.

Sampson, H. 2004. Romantic rhetoric, revisionist reality: the effectiveness of regulation in maritime education and training. *Journal of Vocational Education and Training* 56(2), pp. 245-267.

Sampson, H. and Bloor, M. 2007. When Jack gets out of the box: the problems of regulating a global industry. *Sociology* 41(3), pp. 551-569.

Sampson, H. and Schroeder, T. 2006. In the wake of the wave: globalisation, networks, and the experiences of transmigrant seafarers in Northern Germany. *Global Networks* 6(1), pp. 61-80.

Sampson, H. and Wu, B. 2003. Compressing time and constraining space: the contradictory effects of ICT and containerization on international shipping labour. *International Review of Social History* 48(Supplement), pp. 123-152.

Sampson, H., Walters, D., James, P. and Wadsworth, E. 2014. Making headway? Regulatory compliance in the shipping industry. *Social & Legal Studies* 23(3), pp. 383-402.  
doi:10.1177/0964663914529684

Scheurman, G. 1998. From behaviorist to constructivist teaching. *Social Education* 62(1), pp. 6-9.

Schofield, K. and McDonald, R. 2004, *Moving on: report of the high level review of training packages*. Melbourne: Australian National Training Authority.

Scholte, J. A. 2000. *Globalisation: a critical introduction*. New York: Palgrave.

Schröder, J-U., Pourzanjani, M. and Zade, G. 2004. The thematic network on the subject of maritime education and training and mobility of seafarers (METNET): the final outcomes. *4th IAMU General Assembly*. Available at: <http://iamu-edu.org/wp-content/uploads/2014/06/schroder-pourzanjani-zade.pdf> [Accessed: 5 July 2015].

Schumacher, R. 2012. *Free trade and absolute and comparative advantage: a critical comparison of two major theories of international trade*. Potsdam: Universitätsverlag Potsdam.

Scott, J. 1990. *A matter of record: documentary sources in social research*. Cambridge: Polity Press.

SeaNews. 2013. Too Many Ships in the World Merchant Fleet. *Turkey SeaNews* 8 April. Available at: <http://www.seanews.com.tr/too-many-ships-in-the-world-merchant-fleet/99073/> [Accessed: 8 June 2015].

Sekimizu, K. 2014. Putting the focus on implementation. *IMO News* 3, p. 5.

Selkou, E. and Roe, M. 2004. *Globalisation, policy and shipping: Fordism, post-Fordism and the European Union*. Cheltenham: Edward Elgar Publishing Limited.

Sherar, M. G. 1973. *Shipping out: a sociological study of American merchant seamen*. Cambridge, MD: Cornell Maritime Press.

Smith, A. 2007. *Adequate crewing and seafarers' fatigue: the international perspective*. Centre for Occupational and Health Psychology, Cardiff University. Available at: <http://www.itfseafarers.org/files/seealsodocs/3193/ITF%20FATIGUE%20REPORT%20final.pdf> [Accessed: 18 October 2014].

Sperling, G. H. 1998. The new conventions on standards of training, certification and watchkeeping: what, if anything, does it mean? *Tulane Maritime Law Journal* 22, pp. 595-617.

Squire, D. 2005. *The human element in shipping*. Available at: [http://www.he-alert.org/filemanager/root/site\\_assets/standalone\\_pdfs\\_0355-/he00350.pdf](http://www.he-alert.org/filemanager/root/site_assets/standalone_pdfs_0355-/he00350.pdf) [Accessed: 1 July 2015].

Squire, D. 2010. Facing the challenge. *Alert!* 23, p. 1. Available at: [http://www.he-alert.org/objects\\_store/23.pdf](http://www.he-alert.org/objects_store/23.pdf) [Accessed: 1 July 2015].

SSB. 2014. *SSB interview tips*. Available at: <https://www.ssbinterviewtips.in/p/required-officer-like-qualities-olqs.html> [Accessed: 15 May 2016].

Stalmeijer, R. E., Dolmans, D., Wolfhagen, I. and Scherpbier, A. 2009. Cognitive apprenticeship in clinical practice: can it stimulate learning in the opinion of students? *Advances in Health Sciences Education* 14(4), pp. 535-546.

Stiglitz, J. E. 2002. *Globalization and its discontents*. New York: W.W. Norton & Company.

Stopford, M. 1992. *Maritime economics*. London: Routledge.

Stopford, M. 1997. *Maritime economics*. 2<sup>nd</sup> ed. London: Routledge.

Strauss, A. L. 1987. *Qualitative analysis for social scientists*. Cambridge: Cambridge University Press.

Strauss, A. L. and Corbin, J. 1998. *Basics of qualitative research: techniques and procedures for developing grounded theory*. 2<sup>nd</sup> ed. Thousand Oaks, CA: Sage Publications.

Sturmey, S. G. 1975. A consideration of the ends and means of national shipping policies. *Shipping Economics: Collected Papers*. London: MacMillan Press.

Sweeney, K. 2014. Greater workload means ships need to have more crew. *Professional Mariner* 2 September. Available at: <http://www.professionalmariner.com/September-2014/Greater-workload-means-ships-need-more-crew/> [Accessed: 5 April 2016].



Tausig, J. E. and Freeman, E. W. 1988. The next best thing to being there: conducting the clinical research interview by telephone. *American Journal of Orthopsychiatry* 58, pp. 418-427.

Tarricone, P. and Luca, J. 2002. Employees, teamwork and social interdependence—a formula for successful business? *Team Performance Management: An International Journal* 8(3/4), pp. 54-59. doi: 10.1108/13527590210433348

Tesch, R. 1990. *Qualitative research: analysis types and software tools*. London: Falmer.

The Navigator, 2014. Bridge resource management: working as a cohesive team. *The Navigator* October 2014(7) Available at: file:///C:/Users/ssosm3/Downloads/the\_navigator\_-\_october\_2014\_-\_low\_resolution.pdf. [Accessed: 12 May 2015].

Thomas, J. 1993. *Doing critical ethnography*. Newbury Park, CA: Sage.

Toner, P. 2002. The occupational and skill structure of new apprenticeships: a commentary. *Labour & industry: a journal of the social and economic relations of work* 13(1), pp. 55-71.

UFS. 2014. *Of EMSA assessment, maritime education and training*. Available at: <http://unitedfilipinoseafarers.com.ph/of-ems-a-assessment-maritime-education-and-training/> [Accessed: 7 April 2016].

UKCES. 2009. *Ambition 2020: world class skills and jobs for the UK*. Available at: [http://webarchive.nationalarchives.gov.uk/+http://www.ukces.org.uk/PDF/UKCES\\_FullReport\\_USB\\_A2020.pdf](http://webarchive.nationalarchives.gov.uk/+http://www.ukces.org.uk/PDF/UKCES_FullReport_USB_A2020.pdf) [Accessed: 17 February 2014].

UN. 1982. *United Nations Convention on the Law of the Sea: adopted [by] the Third United Nations Conference on the Law of the Sea*. New York: SI.

UN. 2006. *Atlas of the oceans*. Available at: <http://www.oceansatlas.org/subtopic/en/c/299> [Accessed: 11 November 2016].

UNCTAD. 2015. *Review of maritime transport*. Geneva: United Nations Publication.

Vanchiswar, P. S. 1997. Translating international maritime training standards into national regulations. In: Zade, G. *Maritime education and training: a practical guide*. London: The Nautical Institute, pp. 160-166.

Vaughan, K. 2017. The role of apprenticeship in the cultivation of soft skills and dispositions. *Journal of Vocational Education & Training* 69(4), pp. 540-557. doi: 10.1080/13636820.2017.1326516

Walters, D. and Bailey, N. 2013. *Lives in peril: profit or safety in the global maritime industry?* Basingstoke: Palgrave Macmillan.

Wang, J. and Zhang, S. M. 2000. Management of human error in shipping operations. *Professional safety* 45(10), p. 23.

Washor, K. S. 2015. *Bridging the soft-skill gap from education to employment through internships*. PhD Thesis, University of Rhode Island.

Wenger, E. 1998. Communities of practice: learning as a social system. *Systems Thinker* 9(5), pp. 2-3.

Wenger, E. 1999. *Communities of practice: learning, meaning, and identity*. Cambridge University Press.

Wenger, E., McDermott, R. and Snyder, W. 2002. *Cultivating communities of practice*. Boston, MA: Harvard Business School Press.

Wenger, E. 2011. *Communities of practice: a brief introduction*. Available at: <https://scholarsbank.uoregon.edu/xmlui/bitstream/handle/1794/11736/A%20brief%20introduction%20to%20CoP.pdf?sequence%20%80%B0=%20%80%B01> [Accessed: 20 March 2016].

Wenger, E. and Snyder, W. 2000. Communities of practice: the organizational frontier. *Harvard Business Review* (January – February), pp. 139-145.

Wenger-Trayner, B. and Wenger-Trayner E. 2015. *Introduction to communities of practice*. Available at: <http://wenger-trayner.com/introduction-to-communities-of-practice/> [Accessed: 17 March 2015].

Wilson. 2016. *Running costs*. Available at: <https://www.wilsonship.no/en/ship-management/running-costs>. [Accessed: 5 April 2016].

Williams, M. and May, T. 1996. *Introduction to philosophy of social research*. London: Routledge.

Winbow, A. 2002. The importance of effective communication. *International Seminar on Maritime English*. Maritime Faculty, Istanbul Technical University, Istanbul, Turkey, 20-22 March, 2002. Available at: [https://sielearning.tafensw.edu.au/toolboxes/MaritimeOperations/TDMME101AUnderstandOrders/Assets/Task/uo\\_tool\\_2.01\\_the\\_importance\\_of\\_effective\\_communication.doc](https://sielearning.tafensw.edu.au/toolboxes/MaritimeOperations/TDMME101AUnderstandOrders/Assets/Task/uo_tool_2.01_the_importance_of_effective_communication.doc) [Accessed: 2 October 2013].

Winbow, A. 2005. Modern training packages. *Seaways: The International Journal of the Nautical Institute* July, pp.12-14.

Winchester, N., Sampson, H. and Shelly, T. 2006. *An analysis of crewing levels: findings from the SIRC global labour market study*. Cardiff: Cardiff University. Available at: <http://orca-mwe.cf.ac.uk/64731/1/Analysis%20of%20crewing%20levels.pdf> [Accessed: 23 February 2014]

Wolcott, H. F. 1994. *Transforming qualitative data: description, analysis, and interpretation*. Thousand Oaks, CA: Sage Publications.

Wolf, A. 1995. *Competence-based assessment*. Buckingham: Open University Press

Woolley, N. N. and Jarvis, Y. 2007. Situated cognition and cognitive apprenticeship: A model for teaching and learning clinical skills in a technologically rich and authentic learning environment. *Nurse Education Today* 27(1), pp. 73-79.

Zade, G. 2000. *METHAR: Final report for publication*. Sweden: World Maritime University. Available at: <http://www.transport-research.info/sites/default/files/project/documents/methar.pdf> [Accessed: 14 May 2013].

Zec, D., Komadina, P. and Pritchard, B. 2000. Toward a global standard MET system – an analysis of the strengths and weaknesses of present MET systems. *Proceedings of the IAMU Inaugural General Assembly*, pp.140-6. Istanbul; Turkey, 26-29 June 2000. IAMU.

# Appendices

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## APPENDIX 1

### A Typical Shipboard Organisation Chart

Category Department	Officers		Ratings
	Management Level	Operational Level	Support Level
Deck	Captain (Shipmaster), Chief Officer	2 <sup>nd</sup> Officer, 3 <sup>rd</sup> Officer, Deck Cadet	Boatswain, Deck Fitter, Carpenter, Able Seaman (AB), Ordinary Seaman (OS)
Engine	Chief Engineer, 2 <sup>nd</sup> Engineer	3 <sup>rd</sup> Engineer, 4 <sup>th</sup> Engineer, Junior Engineer, Electro- Technical Officer, Engine Cadet	Engine Fitter, Oiler, Engine Wiper
Catering	None	None	Chief Cook, 2 <sup>nd</sup> Cook, Galley Boy (Mess boy), Steward

Source: Author

**APPENDIX 2A**

<b>Participant List – Employers (Shipping Companies/Ship Management Companies)</b>				
<b>Code</b>	<b>Job Title</b>	<b>Company Size</b>	<b>Crew Nationality</b>	<b>Fleet Flag</b>
SC1	Managing Director	Small	Multinational	Mixed-flag
SC2	Vice President – Marine Division	Large	Multinational	Mixed-flag
SC3	Operations Manager	Large	Multinational	Mixed-flag
SC4	Crewing Manager	Medium	Multinational	Mixed-flag
SC5	Managing Director	Large	Multinational	Mixed-flag
SC6	Safety & Quality Manager	Large	Mainly National	Mainly national
SC7	Fleet Director	Medium	Multinational	Mixed-flag
SC8	Fleet Manager	Large	Mainly National	Mainly National
SC9	Operations Manager	Small	Multinational	Mixed-flag
SC10	Training Manager	Medium	Multinational	Mixed-flag

<b>Participant List – Employers (Shipping Companies/Ship Management Companies)</b>				
<b>Code</b>	<b>Job Title</b>	<b>Company Size</b>	<b>Crew Nationality</b>	<b>Fleet Flag</b>
SC11	Fleet General Manager	Small	Multinational	Mixed-flag
SC12	Technical Manager	Medium	Multinational	Mixed-flag
SC13	Training Manager	Large	Multinational	Mixed-flag
SC14	Commercial Manager	Medium	Multinational	Mixed-flag

**APPENDIX 2B**

<b>Participant List – Seafarers</b>			
<b>Code</b>	<b>Seafaring Experience (years)</b>	<b>Rank</b>	<b>Nationality</b>
SF1	25	Captain	Indian
SF2	21	Captain	Pakistani
SF3	21	Captain	Indian
SF4	20	Captain	Iranian
SF5	18	Captain	Iranian
SF6	18	Captain	Ukrainian
SF7	18	Captain	Indian
SF8	17	Captain	Ghanaian
SF9	17	Captain	Polish
SF10	16	Captain	Turkish



<b>Participant List – Seafarers</b>			
<b>Code</b>	<b>Seafaring Experience (years)</b>	<b>Rank</b>	<b>Nationality</b>
SF11	16	Captain	Indian
SF12	14	Captain	Iranian
SF13	22	Chief Engineer	Ukrainian
SF14	21	Chief Engineer	Indian
SF15	19	Chief Engineer	Iranian
SF16	19	Chief Engineer	Filipino
SF17	17	Chief Engineer	Iranian
SF18	16	Chief Engineer	Indian
SF19	16	Chief Engineer	Polish
SF20	14	Chief Engineer	Ukrainian
SF21	12	Chief Engineer	Iranian

<b>Participant List – Seafarers</b>			
<b>Code</b>	<b>Seafaring Experience (years)</b>	<b>Rank</b>	<b>Nationality</b>
SF22	16	Chief Officer	Filipino
SF23	14	Chief Officer	Indian
SF24	12	Chief Officer	Ghanaian
SF25	17	2 <sup>nd</sup> Engineer	Polish
SF26	12	2 <sup>nd</sup> Engineer	Nigerian
SF27	11	2 <sup>nd</sup> Engineer	Iranian

<b>Participant List – Training Institutions</b>			
<b>Code</b>	<b>Job Title</b>	<b>Location</b>	<b>Range of Activity</b>
TC1	Head of Marine College	U.K.	Full range CoC Training
TC2	General Manager	U.K.	Ancillary safety course in-house & main deck and engine CoC courses outsourced
TC3	Dean of the Training Institute	Iran	Full range CoC training
TC4	Dean of Graduate School & Administrator of Curriculum Review	Philippines	Full range CoC training
TC5	Director of Deck Department	Iran	Full range CoC training
TC6	Curriculum Leader - Maritime Studies	U.K.	Full range CoC training
TC7	Director and Principal	India	Full range CoC training

<b>Participant List – Training Institutions</b>			
<b>Code</b>	<b>Job Title</b>	<b>Location</b>	<b>Range of Activity</b>
TC8	Head of Faculty – Marine Department	UK	Maritime degree courses & CoC training

Note 1: A total number of twelve interviews were carried out during two stages of the data collection within the eight training institutions on the list. Four institutions were interviewed twice.

Note 2: Full range of Certificate of Competency (CoC) training refers to full scope of the STCW Convention courses for the officers and officer cadets which results in a Certificate of Competency (operational and management level training courses – See Appendix 1 for operational and management level ranks on board ships).

**APPENDIX 2D**

<b>Participant List – Maritime Organisations</b>	
<b>No.</b>	<b>Organisation</b>
1	The International Maritime Organisation (IMO)
2	The Merchant Navy Training Board (MNTB)
3	Baltic and International Maritime Council (BIMCO)
4	International Shipping Federation (ISF)
5	The Society of International Gas Tanker and Terminal Operators (SIGTTO)
6	International Association of Independent Tanker Owners (INTERTANKO)
7	Iranian Ports and Maritime Administration
8	Trinity House

**Note:** Since the position of the interviewees in the organisations may lead to disclosure of their identity and in order to ensure anonymity of the participants, the title and position of the interviewees are concealed.

## **Interview Schedule (Ship Owners)**

**Research Title:** *COMPETENCY OF MERCHANT SHIP OFFICERS IN THE GLOBAL SHIPPING LABOUR MARKET: A STUDY OF THE 'KNOWING-DOING' GAP*

[NB: Reassure interviewees regarding confidentiality and ask for permission to tape.]

**Company information:** Can you tell me about your company, type of activities, number of ships, number of employees, etc.

- Company's name
- Date established
- Type of activity
- Number of ships
- Types of ships
- Flag of ships
- Number of employees (ship)
- Nationality of seafarers

**Interviewee's biographical information:** Can you please talk about yourself and your role in the company?

- Name
- Position (role in the company)
- Background
- Is interviewee involved with employment?
- Is interviewee involved with training?

**There is a reported shortage of competent officers on a global scale (according to BIMCO/ISF studies as well as statements made by quite a number of shipping**

**companies). May I ask what your experience is in this regard? From where and how do you recruit your shipboard workforce?**

- Do you have / find sufficient competent seafarers to serve onboard your ships?
- From where do you recruit your seafarers?
- What is the seafarers' recruitment method within your system?
- Do you have a cadet recruitment programme?

**Would you please let me know your opinion regarding Maritime Education and Training (MET) in general and STCW in particular? Do you think the current MET system and STCW Convention provisions produce adequately trained, competent and fit for purpose seafarers?**

- Do you perceive shortcomings to the MET system?
- Do you perceive shortcomings to the STCW?
- What kind of knowledge and skills are you actually looking for?
- Are these skills addressed by the STCW provisions?

**Do you think all applicants for your shipboard vacancies are sufficiently trained / competent / skilful as per their Certificate of Competency (CoCs)? And, do you feel the seafarers you recruit are fit for purpose?**

- What are your expectations of the shipboard employees?
- Do you find any differences between different national groups with regard to their training?
- Do you perceive any gap between training being provided to seafarers and competence and job skills you need or expect them to have?
- How do you define insufficiency or inadequacy of training?
- What informs your perception, concerning the knowledge, skills and competency gap of officers?
- Can you provide me with evidence?
- What is the nature of the perceived gap from your point of view? (Give examples)

- Do you have any kind of evaluation system for measuring the competency / efficiency of the seafarers? If so, what do you do with the information you get through this mechanism? Can you show me evidence?

**Do you address the perceived gaps?**

- Do you provide extra training to your seafarers?
- What kind of extra training do you provide for your seafarers?
- Do you have on-board training procedures? Show me evidence.
- Do you have your own training establishment?
- Has your company been successful in introducing your own training in areas where you feel there is a knowledge or skills gap?

**In your opinion, what are the impediments to the education and training of the officers?**

- What potential factors could affect the outcome of the training?
- What do you think are the underlying reasons for the shortcomings in the competence of the officers?

**In your opinion what are the future expectations and needs of employers with regard to seafarers' training, skills and competence?**

- What skills do you think your officers will need to operate your ships in the future?
- What depth of knowledge will you expect from your workforce in future? eg engineers who can carry out full maintenance on board or only operators?
- Do you think changes are needed to the provisions of the STCW in fulfilment of your future expectations? If so, which areas of the STCW Convention do you think need revision?

**Is there anything regarding the interview subject that I have not asked and you would like to talk about?**

Thank you very much for your participation.



## **Interview Schedule (Officers)**

**Research Title:** *COMPETENCY OF MERCHANT SHIP OFFICERS IN THE GLOBAL SHIPPING LABOUR MARKET: A STUDY OF THE 'KNOWING-DOING' GAP*

[NB: Reassure interviewees regarding confidentiality and ask for permission to tape.]

**If possible in advance of the interview, find out about the seafarer's rank, qualifications, background and work experience and other relevant details that build up a profile of the seafarer.**

**Profile of the seafarer:** Please introduce yourself, indicate your position on board (last rank), and let me know about your training and work experience.

- Nationality
- Highest level of qualification (CoC)/last rank
- Number of years have been serving at sea
- Type, range and flag of ships have been serving onboard
- Where have you been trained

**There is a reported shortage of competent officers on a global scale (according to BIMCO/ISF studies as well as statements made by quite a number of shipping companies). May I ask what your experience is in this regard?**

- Do you find competent seafarers serving on board ships under your command/under your supervision/in your department?
- Have you ever experienced seafarers being sacked/fired on board the ships on which you have worked? If so, why were they sacked?

**Would you please let me know about your opinion regarding Maritime Education and Training (MET) in general and STCW in particular? Do you think the current MET system and STCW Convention provisions produce adequately trained, competent and ‘fit for purpose’ seafarers?**

- Do you perceive shortcomings to the MET system?
- Do you perceive shortcomings to the STCW?
- Do you think implementation of the STCW (95) provisions ends up with adequately trained officers?
- What do you perceive are the most important competences seafarers need in order to be considered ‘fit for purpose’?
- Are these skills addressed by the STCW provisions?
- What is your personal experience about STCW (78) and STCW (95)? Do you think upgrading to STCW (95) enhanced the level of competency of officers?

**Do you think officers being assigned on board your ship are sufficiently trained / competent / skilful as per their Certificate of Competency (CoCs)? And, do you feel the seafarers being recruited are fit for purpose?**

- What are your expectations of the shipboard officers?
- Do you find any differences between different national groups with regard to their training?
- Do you perceive any gap between the training being provided to officers and competence and job skills they need to perform their duties?
- How do you define insufficiency or inadequacy of training?
- What informs your perception, concerning the knowledge, skills and competency gap of officers?
- Can you provide me with evidence?
- What is the nature of the perceived gap from your point of view? (Give examples.)
- Do you have any kind of evaluation system for measuring the competency / efficiency of the seafarers? Do you report them to the company? Show me samples.

**How do you address the perceived gap?**

- Do you report the gaps/training needs to the company?
- Does your company take action based upon your reports?
- Do you have on-board training procedures? Show me.

**In your opinion, what are the impediments to the education and training of the officers?**

- What potential factors could affect the outcome of the training?
- What do you think are the underlying reasons for the shortcomings in the competence of the officers?
- Do you pay for your training? Were you sponsored?
- What is your opinion about maritime training colleges? (Training facilities/theoretical training/practical training/simulators/workshops etc.)
- What is your opinion about the quality of the trainers?
- What is your opinion about the examination and evaluation provisions?

**In your opinion what are the future expectations and needs of employers with regard to seafarers' training, competence and skills? What do you think will be the future skills?**

- What skills do you think officers will need to operate ships in the future?
- What depth of knowledge and skills will you need in future, considering the new technologies and changing strategies of ship owners towards maintenance-free ships?
- Do you think changes are needed to the provisions of the STCW in fulfilment of your future expectations? If so, which areas of the STCW Convention do you think need revision?

**Is there anything regarding the interview subject that I have not asked and you would like to talk about?**

Thank you very much for your participation.

## **Interview Schedule (Trainers)**

**Research Title:** *COMPETENCY OF MERCHANT SHIP OFFICERS IN THE GLOBAL SHIPPING LABOUR MARKET: A STUDY OF THE 'KNOWING-DOING' GAP*

[NB: Reassure interviewees regarding confidentiality and ask for permission to tape.]

**In advance of the interview, find out about the training institute information and trainer's qualifications, background and work experience and other relevant details that build up a profile of the training institute and the trainer.**

**Training centre information:** Can you tell me about your training centre and the scope of your activities?

- Training centre name
- Date established
- Scope of training being provided
- Establishment facilities/hardware/software
- Number of trainees

**Interviewee's biographical information:** Can you please talk about yourself and your role in the training centre?

- Name
- Position (role in the training centre)
- Background
- Qualifications

**Would you please let me know your opinion regarding Maritime Education and Training (MET) in general and STCW in particular? Do you think the current MET system and STCW Convention provisions produce adequately trained, competent and ‘fit for purpose’ seafarers?**

- Do you perceive shortcomings to the MET system?
- Do you perceive shortcomings to the STCW?
- Do you think implementation of the STCW (95) provisions ends up with adequately trained officers?
- What do you perceive are the most important competences seafarers need in order to be considered ‘fit for purpose’?
- Are these skills addressed by the STCW provisions?

**Tell me about your training institute’s education and training procedures.**

- What are the prerequisites for your courses?
- How do you design your courses?
- Are your training courses approved by the Administration?
- Do you have a quality standard system?
- Can you show me a sample of your training curricula for officer cadets and officers? (For deck, engine, electronic etc.)
- Tell me about your theoretical and practical courses.
- Tell me about college-based and shipboard training of the officer cadets.
- Do you have procedures/means to monitor on-board training of officer cadets?
- Tell me about your workshops and simulators.
- How do you appoint lecturers/instructors for the courses?
- Do you have upgrading procedures for your instructors?
- Do you have a course evaluation system?
- Tell me about your course assessment procedures.
- Are you accredited by the Administration to conduct CoC exams?

**Do you think the officer cadets and officers are sufficiently trained/competent/skilful for shipboard tasks?**

- Do you perceive any gap between the training being provided to trainees and competence and job skills they need to perform their duties?
- What informs your perception, concerning the knowledge, skills and competency gap of trainees?
- Can you provide me with evidence?
- What is the nature of the perceived gap from your point of view? (Give examples.)

**Do you take measures to address the perceived gap?**

- Can you show me evidence?

**In your opinion, what are the impediments to the education and training of the officers?**

- What potential factors could affect the outcome of the training?
- What do you think are the underlying reasons for the shortcomings in the competence of the officers?

**In your opinion what are the future expectations and needs of employers with regard to seafarers' training, competence and skills? What do you think will be the future skills?**

- What skills do you think officers will need to operate ships in the future?
- What depth of knowledge and skills will they need in future, considering the new technologies and changing strategies of ship owners towards maintenance-free ships?
- Do you think changes are needed to the provisions of the STCW in fulfilment of your future expectations? If so, which areas of the STCW Convention do you think need revision?

**Is there anything regarding the interview subject that I have not asked and you would like to talk about?**

Thank you very much for your participation.

## **Interview Schedule (Maritime Organisations)**

**Research Title:** *COMPETENCY OF MERCHANT SHIP OFFICERS IN THE GLOBAL SHIPPING LABOUR MARKET: A STUDY OF THE 'KNOWING-DOING' GAP*

[NB: Reassure interviewees regarding confidentiality and ask for permission to tape.]

**In advance of the interview, find out about the maritime organisation's information and informant's position and background to build up a profile.**

**Maritime organisation's information:** Can you tell me about your organisation and the scope of your activities?

- Organisation name
- Date established
- Scope of activities

**Interviewee's biographical information:** Can you please talk about yourself and your role in the organisation?

- Name
- Position (role in the organisation)
- Background

**Would you please let me know your opinion regarding Maritime Education and Training (MET) in general and STCW in particular? Do you think the current MET system and STCW Convention provisions produce adequately trained, competent and 'fit for purpose' seafarers?**

- Do you perceive shortcomings to the MET system?
- Do you perceive shortcomings to the STCW?

- Do you think implementation of the STCW (95) provisions ends up with adequately trained officers?
- What do you perceive are the most important competences seafarers need in order to be considered ‘fit for purpose’?
- Are these skills addressed by the STCW provisions?

**Do you think the officer cadets and officers are sufficiently trained/competent/skilful for shipboard tasks?**

- Do you perceive any gap between the training being provided to trainees and competence and job skills they need to perform their duties?
- What informs your perception, concerning the knowledge, skills and competency gap of trainees?
- What is the nature of the perceived gap from your point of view? (Give examples.)

**Do you think the perceived competency gap of the officers is being addressed by the concerned stakeholders?**

- Policy makers’ measures (IMO/administrations/related organisations)
- Ship owners’ measures
- Trainers’ measures

**In your opinion, what are the impediments to the education and training of the officers?**

- What potential factors could affect the outcome of the training?
- What do you think are the underlying reasons for the shortcomings in the competence of the officers?

**In your opinion what are the future expectations and needs of employers with regard to seafarers’ training, competence and skills? What do you think will be the future skills?**

- What skills do you think officers will need to operate ships in the future?



- What depth of knowledge and skills will they need in future, considering the new technologies and changing strategies of ship owners towards maintenance-free ships?
- Do you think changes are needed to the provisions of the STCW in fulfilment of your future expectations? If so, which areas of the STCW Convention do you think need revision?

**Is there anything regarding the interview subject that I have not asked and you would like to talk about?**

Thank you very much for your participation.

**Interview Schedule (2<sup>nd</sup> stage) - Trainers**

**Research Title:** *COMPETENCY OF MERCHANT SHIP OFFICERS IN THE GLOBAL SHIPPING LABOUR MARKET: A STUDY OF THE 'KNOWING-DOING' GAP*

[NB: Reassure interviewees regarding confidentiality and ask for permission to tape record the interview.]

**In advance of the interview, find out about the training institute information and trainer's qualifications, background and work experience and other relevant details that build up a profile of the training institute and the trainer.**

**Training centre information:** Can you tell me about your training centre and the scope of your activities?

- Training centre name
- Date established
- Scope of training being provided
- Establishment facilities/hardware/software
- Number of trainees

**Interviewee's biographical information:** Can you please talk about yourself and your role in the training centre?

- Name
- Position (role in the training centre)
- Background
- Qualifications

**Give brief information to the interviewee about the research question and the first stage interviews, participants, findings as well as the reason for pursuing 2<sup>nd</sup> stage interviews.**

The research interview will broadly look at the following issues:

- What informs trainers' perceptions, concerning the gap between 'training' and 'competence'?
- What is the nature of the perceived gap, as understood by the trainers?
- How do the training institutes address the perceived gap between training and skills?
- In your opinion, what are the impediments to the education and training of the officers?

**As you are aware, IMO made a major revision to the STCW Convention in 2010 in order to ensure that it would still meet the challenges that the shipping industry was facing and will be facing in the near future. The revised Convention is adopted and presently it is in the implementation process by the member states.**

**Would you please let me know your opinion regarding Maritime Education and Training (MET) in general and STCW in particular?**

**What is your opinion about the changes to the Convention?**

**Thinking about STCW, in your opinion, how well does it prepare seafarers to take up their role aboard ship?**

**Think about strengths as well as weaknesses**

**Prompt for items identified from previous interviews**

- In previous interviews the below issues have been raised – are these something you think are the issues?
  - Technical Knowledge
  - Practical skills and on-board training
  - Team-working and communications skills
  - Commercial activities knowledge/business awareness
  - Social aspects and officer-like quality of trainees
  - Shortcomings of the training institutes
  - Quality and quantity of intakes

**As you are aware the new STCW 2010 amendments have now come into effect. Do you think these will address the issues you have mentioned?**

- Do you think implementation of the STCW 2010 provisions ends up with adequately trained officers?
- Can you think of any other gaps except those which are addressed in the revised STCW Convention?
- Examples:  
Commercial activities knowledge/business awareness  
Social aspects and officer-like quality of trainees

**How do you think the training institutes, specifically your institute, are going to meet the challenges in order to satisfy the Administration, ship owners and the trainees' requirements?**

- To what extent do you think your training institute will be able to address training gaps through implementation of the new requirements?

**Have you incorporated the requirements of the STCW 2010 Convention into your curricula?**

- How have the new requirements affected your training curricula?
- Please can you show me evidence.
- Have you introduced new courses/upgrading courses?
- Do you offer new courses to the current certified officers?
- How have the changes affected the cadets' training?

**Have you been conducting and subsequently evaluating the outcomes of the STCW 2010 upgrading courses?**

**If yes, what kind of feedback are you receiving from the officers who are attending the STCW 2010 upgrading courses?**

- Are the officers attending the courses satisfied with the upgrading courses and do they think the courses have a tangible impact on their knowledge/skills/competence?
- Which area of the upgrading courses do they think are adequate and useful?

**In your opinion, what are the impediments to the education and training of the officers in the current MET system?**

- Regulations/resources/facilities/instructors/practical training etc.
- Quality of intakes
- Commitment of the main stakeholders eg. shipping companies/administrations

**In your opinion what are the future expectations and needs of the seafarers' training, competence and skills?**

- What do you think will be the future skills?
- Do you think the current MET regime is appropriate for training the future mariners?
- Which areas and what parts of the STCW Convention do you think need to be further reviewed?

**Is there anything regarding the interview subject that I have not asked and you would like to talk about?**

Thank you very much for your participation.

**Research Information Sheet**

**Title of research project:**

***COMPETENCY OF MERCHANT SHIP OFFICERS IN THE GLOBAL SHIPPING LABOUR MARKET: A STUDY OF THE 'KNOWING-DOING' GAP***

Name of Researcher: **Shahriar Mazhari**

**Information about research and researcher**

**Who am I?**

My name is Shahriar Mazhari and I am a doctoral researcher at Cardiff University. I have been working at sea and ashore in different capacities for more than twenty years. I am conducting this research for my PhD under the supervision of two Senior Researchers at Cardiff University.

**What is the research study about?**

The research will examine whether the merchant ship officers who are being educated, trained, and certified in accordance with the contemporary internationally agreed standards of the STCW Convention, fulfil the perceived requirements of the employers and are 'fit for purpose'. It aims to shed light on the 'skills gap' of the merchant officer trainees and officers, as perceived by stakeholders and to examine the nature and the underlying reasons for such gaps.

**How will the interview be conducted?**

With your permission, I would like to conduct an interview with you to discuss these issues. If you agree, the interview will take about an hour.

**Declaration to the participants**

- The research has the approval of Cardiff University School of Social Sciences Ethics Committee.
- Individuals will not be identified in any publication/dissemination of the research findings.
- ***With the permission of the participants***, interviews will be tape-recorded from which written anonymised transcripts will be created.
- The field-notes and transcripts will only be accessible to myself and my supervisors from the School of Social Sciences and will be kept secure and ***strictly confidential*** in accordance with the Data Protection Act.

If you take part in the study, you can:

- refuse to answer any particular question
- withdraw from the interview at any point
- ask any further questions about the study that occur to you during your participation
- be given access to a summary of the findings from the study, when it is concluded.

### **How will the results of the interviews be used?**

An analysis of the information will form the basis of my PhD thesis and may be published in academic journals, academic research papers and presentations. A summary report might be circulated to all interested participants.

### **Further information**

If you would like further information about the study, you can contact me at any time on:

Tel: 0788 612 8026 or by e-mail at [mazhari@cardiff.ac.uk](mailto:mazhari@cardiff.ac.uk).

If you would like further information about the ethical issues of my research, you can contact the School Research Ethics Committee at [socsi-ethics@cardiff.ac.uk](mailto:socsi-ethics@cardiff.ac.uk)

Thank you in advance for your participation in my research.

**Research Informed Consent Form**

Title of Research Project:

***COMPETENCY OF MERCHANT SHIP OFFICERS IN THE GLOBAL SHIPPING LABOUR MARKET: A STUDY OF THE ‘KNOWING-DOING’ GAP***

Name of Researcher: **Shahriar Mazhari**

Cardiff University – School of Social Sciences

		<b>Please tick</b>
1	I confirm that I have read and understood the information sheet for the above study. I have been given the opportunity to consider the information and ask questions.	
2	I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason.	
3	I agree to take part in the study.	
4	The interview can be recorded.	
5	I understand that only the researcher and his two supervisors will have access to the recording and information I provide for the purpose of this interview.	

\_\_\_\_\_

Name of Participant                      Date                      Signature

\_\_\_\_\_

Name of person taking consent                      Date                      Signature

Two copies: One for participant and one for research file