

Associated Faculty of Nautical Sciences

Intercultural Competence and Communication on Merchant Vessels

Dutch Title

Interculturele Competentie en Communicatie in de Maritieme Industrie.

Sub. Title

Exploring Intercultural Communication and Competence in Maritime Education and Training: An Investigation of Syllabus Implementation, Cultural Challenges, and Effective Strategies for Crew On board Seagoing Vessels.

PhD thesis submitted for the degree of Doctor in Nautical Sciences at the University of Antwerp to be defended by **ASHRAF RAGAB**.

Supervisor(s):

Prof Dr. Ludwina Van Son (Antwerp Maritime Academy),

Prof Dr. Karolien Poels (University of Antwerp).

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List of Abbreviations

Abbreviations	Definition
BRM	Bridge Resource Management
CFA	Confirmatory Factor Analysis
CRQ	Central Research Question
ICC	Intercultural Communication and Competence
ICCM	Intercultural Communication and Competence Management
IMO	International Maritime Organization
JASP	An Analysis software
MET	Maritime Education and Training
Otter.ai	Software program used for generating written transcriptions of speech
PCA	Principal Component Analysis
RQ	Research Question
SMCP	Standard Marine Communication Phrases
SMNV	Standard Marine Navigational Vocabulary
SOLAS	Safety of Life at Sea Convention
SRQs	Secondary Research Questions
STCW	International convention on Standards of Training, Certification and Watch-keeping

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Abstract

The maritime industry operates within a global framework, necessitating efficient intercultural competence and communication for successful collaboration among diverse seafaring teams. This dissertation investigates how the performance of management-level crew can be elevated through the enrichment of the educational curriculum at Maritime Education and Training (MET) institutions, with a specific focus on courses aimed at facilitating intercultural competence. The central research question guiding this study is: How can the performance of management-level crew be elevated through enriching the syllabus of intercultural communication and competence at Maritime Education and Training (MET) institutions? This research aims to identify and implement syllabus enhancements that specifically target intercultural competence to improve the effectiveness and operational efficiency of management-level crew.

To address this question, the study examines the extent to which intercultural competence courses are currently integrated into the MET curricula and their impact on crew performance. It also assesses how communication skills are taught within the academic framework of MET institutions and their role in enhancing intercultural interactions. Additionally, the study identifies the predominant cultural hurdles and communication barriers faced by seafarers aboard seagoing vessels, and explores the challenges educators and students encounter in teaching and learning intercultural communication and competence at MET institutions. Furthermore, it evaluates the most effective strategies that maritime organizations can employ to enhance the intercultural proficiency of their crew members and alleviate intercultural discord.

Employing an interdisciplinary approach, this research integrates theories of intercultural communication, organizational behaviour, and maritime operations to illuminate the impact of cultural diversity on crew dynamics, safety, and overall operational efficacy. Through extensive literature review, interviews, and empirical research, the study provides actionable insights into the development of tailored training programs and communication strategies. The findings of this dissertation aspire to advance knowledge, inform policy, and enrich the maritime industry by promoting a more harmonious and culturally sensitive environment conducive to safe and efficient seafaring. By focusing on the enhancement of the MET curriculum, this research aims to foster a culture of inclusivity, cooperation, and shared understanding on board, ultimately leading to improved performance of management-level crew.

Furthermore, it suggests the development of tailored training programs and communication strategies to augment intercultural competence among seafarers, fostering a culture of inclusivity, cooperation, and shared understanding on board.

Personal Statement

As a researcher and lecturer at the University of Applied Sciences in Elsfleth, Department of Nautical Science, my intended contribution is to advance both the theoretical understanding and practical application of intercultural communication and competence in maritime education and training. My goal is to enhance the effectiveness of maritime operations by fostering better cultural awareness and communication skills among seafarers, which are critical for safety, efficiency, and overall operational success in the diverse and globalized maritime industry.

My positionality as a researcher is significantly influenced by my background as a master mariner with migration experience. Born in Egypt, I have pursued my studies and professional career globally, particularly in Western Europe. This unique perspective has provided me with first-hand experience of the cultural complexities and communication challenges that arise in a multicultural maritime environment.

My practical teaching experience includes experimenting with intercultural communication and competence training for management-level personnel as an elective course. This has given me valuable insights into the educational strategies that are most effective in conveying these critical skills. Additionally, my diverse teaching experiences in foreign countries and different cultural settings have enriched my understanding of how to navigate and address cultural differences in a learning environment.

Having worked onboard ships with various nationalities, I have observed and experienced a range of management styles and work environments. These experiences have underscored the importance of intercultural competence in promoting harmonious and productive teamwork. Over the past eight years, I have engaged with students, maritime experts, and industry professionals in extensive discussions about intercultural communication and competence. These interactions have further informed my research and teaching methodologies, allowing me to integrate practical insights with academic theory effectively.

In summary, my contribution aims to bridge the gap between theory and practice in maritime education by developing and promoting intercultural communication and competence training. By doing so, I hope to prepare future seafarers for the diverse and dynamic challenges of the global maritime industry, ultimately contributing to safer and more efficient maritime operations.

Chapter 1 Introduction

The maritime industry's increasing diversity presents significant communication challenges, necessitating the development of intercultural communication skills (Noble et al., 2011). These challenges include linguistic competence, effective communication techniques, and cultural awareness (Wang & Gu, 2005). The global seafaring workforce, estimated at 1.65 million, is predominantly sourced from developing countries, particularly China, India, and the Philippines (Slišković & Penezić, 2015). This multicultural mix can lead to misunderstandings and accidents at the ship/port interface, highlighting the need for cultural awareness and sensitivity training (Horck, 2008).

Cultural diversities further complicate interactions, underscoring the importance of effective communication strategies. The dominance of multilingual and multicultural seafarers in the global fleet makes it essential to address these challenges to ensure safety and efficiency (Fan et al., 2015). The increasing cultural and linguistic diversity among maritime crews presents significant challenges that impact various aspects of onboard operations, including hierarchy, decision-making during emergencies, and team cohesion. Research highlights that these diversities can lead to communication barriers, safety risks, and reduced team cohesion (Horck, 2008; Theotokas, 2007; Benton, 2005). These issues are often exacerbated by the lack of adequate training in intercultural communication, which is crucial for managing cultural differences and fostering a harmonious work environment (Horck, 2008; Jensen, 2020). This gap in training can lead to misunderstandings, hinder effective teamwork, and escalate social tensions among diverse crew members. To effectively address these challenges, it is recommended that maritime education institutions enhance their curricula to include comprehensive cultural awareness and sensitivity training, as well as stress management and diversity training in intercultural communication (Horck, 2008; Theotokas, 2007; Benton, 2005; Jensen, 2020). By focusing on these areas, maritime education can better prepare seafarers to manage cultural differences, resolve conflicts, and maintain safety and efficiency in their operations.

By integrating intercultural communication skills into maritime training programs, the MET institutions can better prepare seafarers to navigate the complexities of a multicultural work environment. These skills are indispensable for enhancing overall maritime operations, ensuring that the industry can continue to function safely and efficiently in a globalized world (Schäffner & Dimitriu, 2012); (Adler & Aycan, 2018).

There is a strong case for developing intercultural communication and competence skills in today's business landscape. According to Antal and Friedman (2003) such communication skills are crucial for engaging with people from varied cultural

backgrounds promoting greater receptiveness and acceptance in cross cultural interactions (Ilie, 2019). This ability entails navigating identities and communicating proficiently as emphasized by Chen and Starosta (1996).

The importance of intercultural competence in the maritime industry is emphasized by Ircha (2006), who emphasizes the need for standardized training to address communication challenges. Furthermore, Lenartowicz, Johnsen and Konopaske (2013) underscore the value of awareness in achieving success in management and suggest a framework for knowledge transfer. Others advocate for integrating technology into training. Li, W. (2011) specifically praises the advantages of using networking platforms and practical field exercises, while Li, J. and Li, C. (2020) emphasize the importance of a teaching pattern that combines theory and practice, using a variety of tools such as virtual environments and live broadcasts.

My research will underscore the importance of studying Intercultural Communication and Competence (ICC) in the maritime sector. Its aim is to identify salient features for inclusion in a course or training package at educational institutions. Besides, it intends to provide an outline for a curriculum framework that could guide teaching and learning processes.

1.1 Research significance

The maritime sector is well-known for having a vast array of employees, consisting of individuals from different cultural backgrounds. This diversity brings about various difficulties in communication and/or teamwork that may have negative consequences for safety and general operations (Bergheim et al., 2015). With regard to seafarers, intercultural competence has become a key issue concerning how they deal with cultural dissimilarities (Genkova & Ringeisen, 2016). Respect and empathy for diverse cultures correlate with more professional working relationships and avoidance of misunderstandings (Chirea-Ungureanu C. , 2021). In addition, the development of communication skills, particularly cross-cultural ones, is important to the competent management of maritime enterprises (Chirea-Ungureanu & Rosenhave, 2016).

The changing constitution of maritime crews necessitates intercultural expertise (Choe & Nollan, 2015) and exposes the lack of standardized intercultural communication training under the STCW Convention (Bergheim et al., 2015). Hence, it is crucial to establish specialized teaching programs to improve mariners' cultural awareness and communication skills (Choe & Nollan, 2015). This would enhance safety and efficiency in shipping, besides fostering a more inclusive and harmonious spirit throughout the maritime industry.

1.2 Research problem

The shipping world is one characterized by complexity and diversity in culture, where Seafarer often experience multiple communication challenges which may hinder their work efficiency and safety. Such challenges are rooted in many factors such as language discrepancies, cultural differences, lack of intercultural competency skills, and resistance to multiculturalism.

Jensen and Oldenburg (2020) provided research insights that illuminate a vital factor for seafarers' interactions with colleagues from various backgrounds. The study highlighted how various factors, including the competence of leaders, contribute to the challenges of intercultural communication among maritime professionals. Portela and Pérez (2016) also observed that differences in multiple languages, as well as multiculturalism, were the reasons why seafarers face difficulties when managing complications related to ship operations. The "differences in multiple languages" refers to the variety of languages spoken by the crew members, which can lead to communication barriers and misunderstandings in critical situations.

Despite English being established as the standard language for maritime communication, its role as a lingua franca introduces significant risks and challenges. Variations in English proficiency, coupled with diverse educational backgrounds and cultural differences among crew members, can lead to misunderstandings and misinterpretations ((Schriever, 2008); (Kaur J. , 2011); (Noble et al., 2011)). The assumption that a common language alone ensures effective communication is often misguided. This belief overlooks the complexities of language use, including the lack of agreed-upon standards for English proficiency and common phraseology (Campbell-Laird, 2004), which can obscure nuanced interpretations and lead to communication failures. These challenges are exacerbated by the fact that differing cultural contexts and educational experiences can affect how maritime terminology and procedures are understood and applied. Therefore, while English serves as a common means of communication, there is a critical need for enhanced language proficiency and a deeper understanding of the linguistic and intercultural features that influence communication in the maritime sector to ensure safety and operational efficiency.

Astratinei (2016) stressed the risks of cultural misunderstandings thereby indicating the importance of an all-inclusive intercultural training to protect seafarers from conflicts and safety threats. Hu (2017) suggests cultural-awareness programs as effective means for bridging communication gaps among seafarers by increasing their comprehension of cultural subtleties. Progoulaki and Theotokas (2016) address the problems faced by crew managers when putting together multicultural teams with the right communication skills and intercultural competence necessary to thrive in a diverse maritime environment.

Similarly, Bolt and Lashley (2015) show that the varied opinions of seamen on the issue are different – some think that cultural diversity leads to difficulty in communication, while others look at it as an opportunity for building cultural intelligence. Additionally, Tang, Llangco and Zhao (2015) discovered that some nationalities typically consider citizens of other countries as rivals or enemies, thereby further complicating communication among sailors.

However, the synthesis of research findings indicates that there can be cultural conflicts and safety risks on ships. In other words, different languages and cultures may make it hard for one to communicate while at sea. These different perspectives held by seamen on multiculturalism & interpersonal communication issues stress the difficulties encountered when trying to promote an efficient intercultural communication system in maritime enterprises.

1.3 Research background

The research background will reveal the importance of intercultural communication and competence and specify various skills. Those skills would allow individuals to effectively interact and communicate with people from diverse cultural backgrounds. The research of Nowakowska-Buryła (2015), D'Aniello, Piana & Gaeta (2015), and Liao (2020) has shown that intercultural competence is a skill-based set encompassing attitudes, knowledge, and abilities. These attributes promote appreciation for cultural differences and subtleties.

Consequently, the importance of intercultural competence is highlighted with the maritime scope, where maritime crew sail across the world as multicultural teams aboard ships (Marczak, 2022). Chybowski, Gawdzińska & Laskowski (2019) and Behrendt & Szczepanek (2013) have correspondingly emphasized that shipping activities involve complex and specialized tasks that require thorough training to ensure safety and efficiency.

Correspondingly, International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers (STCW) is a pivotal framework ensuring seafarers' professional competency (Ruan & Wei, 2013), with its revision overseen by the International Maritime Organization (IMO). Effective implementation and assessment of these standards require collaboration between governments and the maritime industry (Ziarati & Maritime, 2006). The IMO plays a central role in establishing training and evaluation standards for seafarers through the STCW convention (Ghosh & Ruggunan, 2015). While the IMO sets these standards, it does not enforce them. Instead, member states are responsible for enforcing these standards at the national level and international level. This approach has led to improved industry practices.

Despite the vital need for seafarers to possess intercultural competence in navigating diverse teams and to encourage cross-cultural relations, the current STCW framework lacks specific provisions for such training, thereby leaving seafarers exposed to misunderstandings, conflicts, and safety hazards (Astratinei, 2016), (Hu, 2017) and (Portela & Pérez, 2016).

To bolster the dedication of Maritime Education and Training (MET) institutions to these regulatory frameworks, the IMO has introduced the innovative "IMO Model Courses." Nevertheless, challenges persist in the execution of these standards, characterized by delays in addressing shortages by international bodies (Albayrak & Ziarati, 2010). IMO members can be slow to adopt conventions considered to be against their national interests (Wang & Gu, 2005) and (Tang et al., 2015).

In addition, the current scope of the STCW convention raises concerns about the absence of specific criteria regarding seafarers' acquisition of cultural understanding, development of intercultural communication skills, and demonstration of intercultural competence. While the STCW Convention does stress the importance of standard maritime English proficiency, it fails to address competencies related to intercultural communication and management. The Manila Amendments 2010 to the STCW Convention do include a provision stating that officers should be able to perform their duties with a multilingual crew, including the ability to use and understand the IMO Standard Marine Communication Phrases. However, this provision does not comprehensively address the broader aspects of intercultural communication and management (see Table 1 and Table 2) Instead, its primary focus remains on technical and safety training materials, leaving a notable gap in the academic instruction of intercultural communication and competence. This oversight has led to discrepancies among MET institutions in the consistent implementation of the STCW code (Ghosh & Ruggunan, 2015). This could be attributed to the absence of detailed guidance within the STCW code regarding intercultural communication and competence (ICC) training methodologies, leading to differing approaches across institutions. The specifics of instructional methods are typically outlined in the IMO Model Courses, while STCW primarily establishes the minimum competency standards for officers aboard ships.

The STCW Convention mentions intercultural communication and competence requirements sparsely (see Table 1 and Table 2), primarily in sections such as STCW A2/I, II, and III. However, the emphasis in these sections is on competencies like 'Maintaining a safe navigational watch' and 'Bridge Resource Management.' While the convention addresses communication, it mainly focuses on the usage of standard marine communication phrases (SMCP) outlined by the IMO, without delving into the specifics of intercultural communication skills and competence. Notably, the requirements for Bridge Resource Management (BRM) in STCW do not explicitly imply intercultural competence in terms of language knowledge. For example, the management level Table 1 and Table 2 are primarily emphasizes acute safety rather than general well-being, and it does not mention ICC. It's essential to consider both operational and management levels, as well as the support level, as addressees for instructional methods aimed at enhancing intercultural communication and competence.

Table 1: STCW A2/II, Table of minimum competence (Bridge Resource Management)
(Source: STCW2010)

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Maintain a safe navigational watch (continued)	<p><i>Bridge resource management</i></p> <p>Knowledge of bridge resource management principles, including:</p> <ul style="list-style-type: none"> .1 allocation, assignment, and prioritization of resources .2 effective communication .3 assertiveness and leadership .4 obtaining and maintaining situational awareness .5 consideration of team experience 	<p>Assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> 1 approved training 2 approved in-service experience 3 approved simulator training 	<p>Resources are allocated and assigned as needed in correct priority to perform necessary tasks</p> <p>Communication is clearly and unambiguously given and received</p> <p>Questionable decisions and/or actions result in appropriate challenge and response</p> <p>Effective leadership behaviours are identified</p> <p>Team member(s) share accurate understanding of current and predicted vessel state, navigation path, and external environment</p>

Table 2: STCW A2/II Table of minimum competence (English Language) (Source: STCW 2010)

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Use the IMO Standard Marine Communication Phrases and use English in written and oral form	<p><i>English language</i></p> <p>Adequate knowledge of the English language to enable the officer to use charts and other nautical publications, to understand meteorological information and messages concerning ship's safety and operation, to communicate with other ships, coast stations and VTS centres and to perform the officer's duties also with a multilingual crew, including the ability to use and understand the IMO Standard Marine Communication Phrases (IMO SMCP)</p>	<p>Examination and assessment of evidence obtained from practical instruction</p>	<p>English language nautical publications and messages relevant to the safety of the ship are correctly interpreted or drafted</p> <p>Communications are clear and understood</p>

For this divide to be bridged, integrating intercultural communication and competence training within the STCW is of utmost importance. This kind of training should encompass cultural empathy and improved communication skills for interacting with individuals from diverse backgrounds.

Although English functions as the common language (*lingua franca*) aboard ships, it is important to recognize that this does not eliminate all communication barriers. The use of English is crucial for facilitating communication in a multilingual crew environment (Schriever, 2008). However, variations in language proficiency, the presence of multiple languages, and the loss of universal communication methods underscore the limitations of relying solely on English (Sampson & Zhao, 2003). This situation emphasizes the need for effective language learning approaches and a "bottom-up" strategy that incorporates plurilingual interactions to address communication challenges (Sampson & Zhao, 2003). Research has explored how English functions alongside other languages and highlighted the necessity for strategies that accommodate these diverse linguistic contexts (Hülmbauer & Seidlhofer, 2013).

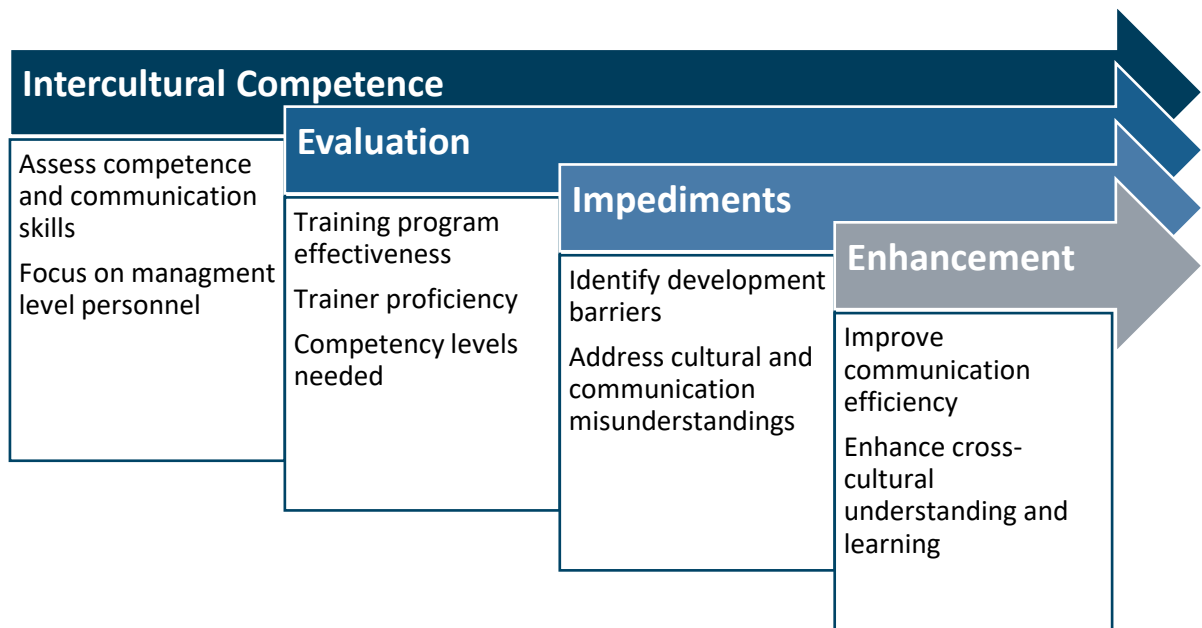
The importance of intercultural competence is further underscored by the concept of minimum competency (Emad & Roth, 2008). This concept highlights a gap in the current practices of many MET institutions. Some institutions offer optional intercultural training or incorporate it into their English courses. However, the lack of consistency and widespread adoption among institutions presents challenges in ensuring that all seafarers attain the necessary intercultural competence skills. Establishing a clear minimum standard for intercultural communication and competence in training programs could help elevate the skills of students and future management-level crew members. Therefore, the absence of a minimum competence adopted by IMO on intercultural communication training within the maritime sector, as indicated by Frolova (2020) and Horck (2006), raises concerns about accidents caused by language barriers. Rathje (2010) suggests a more comprehensive and obligatory approach based on his updated understanding of culture and intercultural competence. Such an approach should encompass not only language proficiency but also cultural awareness training and innovative teaching methods to prepare seafarers to operate effectively in culturally diverse work environments.

1.4 Research objectives

Traditionally, effective leadership in managing a team of independent individuals involves diagnosing problems, exploring potential solutions, and implementing the optimal course of action (Salas et al., 2005). This entails overseeing members with clearly distinct tasks that are interdependent and aligned towards a common/shared objective Lu, Hsu and Lee (2016) have proposed that the nationalities of seafarers should be taken into account when evaluating the impact of leadership on safety behaviour and attitude at sea. This research posits that intercultural competence plays a crucial role in shaping the safety culture on board vessels, as will be detailed in the following sections.

This research aims to assess the intercultural competence and communication skills of maritime management personnel, specifically focusing on individuals involved in Maritime Education and Training (MET) institutions. (As shown in Figure 1) The evaluation encompasses the effectiveness of training programs, the proficiency of trainers, and the overall competency levels among management personnel within MET institutions. It will identify factors impeding the development of these competencies and tries to enhance communication efficiency and cross-cultural understanding within the maritime sector.

Figure 1: Research Objective (Source: Own Work)



1.5 Research question(s)

In light of the research scope, the following research question are to be discussed:

1.5.1 Central research question

How can the performance of management-level crew be elevated through enriching the syllabus of intercultural communication and competence at Maritime Education and Training (MET) institutions?

1.5.2 Secondary research questions

This question is the main focus of the research, branching into the following secondary research Questions (SRQs):

1. To what extent are courses of intercultural competence integrated into the educational curricula at Maritime Education and Training (MET) institutions?
2. To what extent is the teaching of communication skills emphasized within the academic framework of Maritime Education and Training (MET) institutions?
3. What are the predominant cultural hurdles and communication barriers faced by seafarers aboard seagoing vessels?
4. What challenges do educators and students encounter in teaching and learning intercultural communication and competence at Maritime Education and Training institutions?
5. What most effective strategies can maritime organizations employ to enhance the intercultural proficiency of their crew members and alleviate intercultural discord?

This dissertation seeks to answer these questions to improve the performance and promote harmonious work among management-level crew members in the maritime sector.

1.6 Methodological approach

To directly address the main research question, which involves exploring multifaceted aspects of intercultural communication and competence within MET institutions, a mixed methods approach is employed. This intentional choice of method allows for a thorough investigation that combines quantitative analysis to identify trends and patterns, and qualitative insights to delve into the nuances and underlying reasons behind these trends.

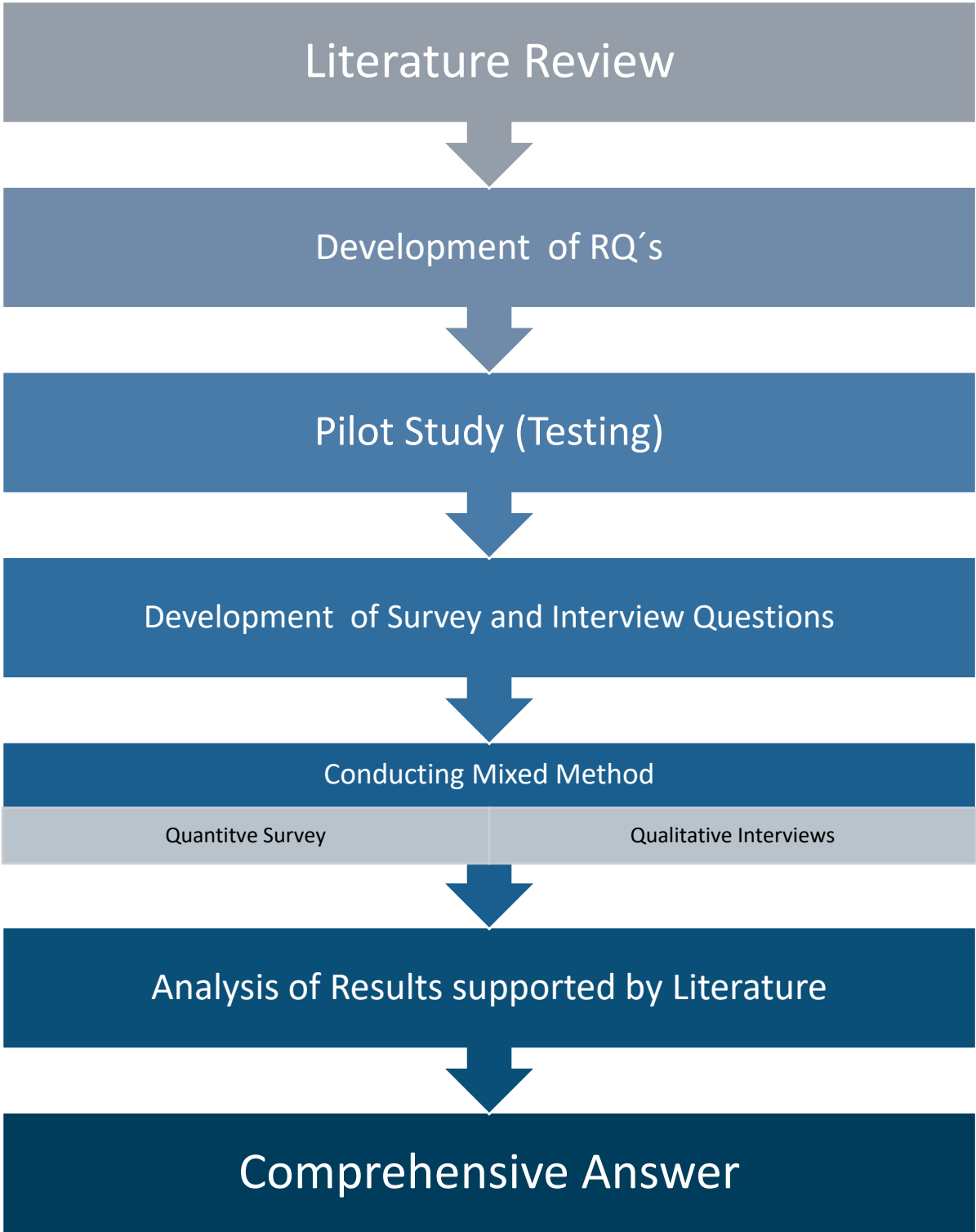
Vaast (2002) and Hood (2015) approve the use of mixed methods, with Vaast underscoring the need for both broad and deep observations, and Hood emphasising the value of different perspectives gleaned from varied methods. Similarly, Aagaard-Hansen and Svedin (2009) also suggest using two methods for research that involves multiple subjects and Corner (1991) that using different research methods in one study gives a better understanding of the topic.

The simultaneity of quantitative and qualitative approaches in research on intercultural communication and competence has been viewed as an interesting issue. Some scholars argue that the distinction between these two approaches is in the construction of the research method, as both ultimately aim to understand the qualities of the subject (Korzenny & Korzenny, 1984). Others, like Jia et. al (2021), explore the intersection of both approaches, suggesting a need for methodological investigation. While Singleton (1999) and Hines (1993) highlight the advantages of blending large-scale international data with traditional survey research, respectively. This discussion underscores the importance of considering methodological approaches in research on intercultural communication and competence, which may influence the success of understanding the maritime sector in diverse cultural contexts.

It is important to acknowledge that the distinction between quantitative and qualitative approaches remains methodologically and epistemologically a critical one. In my analysis, I refer to this distinction on both a methodological and epistemological level to illustrate the complexities of studying intercultural communication.

The methodological approach involved several distinct steps as shown in Figure 2:

Figure 2: Progress of Research Method (Source: Own Work)



Literature review: Leading to the research question, a comprehensive review of existing literature was conducted to initially define and plan for testing various aspects of the research.

Pilot study: A pilot study was conducted with 22 participants, consisting of open-ended question interviews. This pilot study comprised 37 questions covering diverse areas to explore the suitability and feasibility of the questions to imply later into the survey and the interviews. For more details and questions used into the pilot study see Table 37 in Annex IV Pilot Study

Mixed method development: Following the pilot study, the author devised a mixed method approach tailored to construct a comprehensive qualitative survey and quantitative method specifically designed to address the unique research questions of this study. This choice was made to ensure a robust exploration of the research topic, allowing for a deeper understanding of the intricacies involved and enabling a thorough analysis of the collected data.

Alignment with research questions: Both the survey and interviews were aligned with the five core research questions outlined in 1.5.

Quantitative survey: The quantitative survey was conducted with 36 statements, each rated on a 5 point Likert scale (ranging from "strongly agree" to "strongly disagree") among a random sample of 100 seafarers and maritime professionals from diverse groups within the maritime industry, targeted through an online community. It focused on three main axes: teaching intercultural competence, teaching communication competence, and challenges faced by seafarers on board.

Qualitative interviews: Qualitative interviews were conducted with 25 participants, employing six semi-structured questions. These participants included management-level masters, chief mates, and nautical students in their last semester at Jade University. The interviews aimed to support the results from the qualitative survey and uncover new perspectives that might emerge from the participants.

Comprehensive answer: The culmination of these data gathering methods aimed to provide a comprehensive response to the main research question and support the overall purpose of the study.

Chapter 2 Literature Review

This chapter provides a comprehensive analysis of the literature review, illuminating the key subjects that form the pillars of this research. These subjects include culture, communication, maritime education, and the crucial integration of intercultural communication and competence within maritime training programs. The selection of these specific subjects is grounded in a foundation of scholarly research and informed by ongoing pedagogical engagements in the field.

2.1 Understanding culture and overcoming cultural challenges faced by seafarers

Horck (2010) has emphasized the importance of cultural awareness in MET institutions, stressing the need to incorporate courses on cultural awareness and improved communication to mitigate errors and improve safety performance. In the case of multinational crews this issue assumes heightened relevance, as a failure to assimilate other cultures may lead to very risky incidents and accidents (Horck, 2006). Through Caesar's and Cahoon's (2015) approach, a critical gap within MET institutions is highlighted, and psychological assessment is recommended to understand their student cohorts' career aspirations. Moreover Carol-Dekker (2018) argues that maritime leaders should have cultural intuition and sensitivity for effective engagement with different maritime cultures. All these inquiries stress the immediate necessity for MET institutions to include cultural awareness into their curricula for future seafarers to succeed within diverse maritime environments.

2.1.1 Culture

Culture is a powerful word that hold various terms and elements that been researched and discussed for many centuries. The definition of culture is the distinctive way of life of a particular defined group or community of people. This information is provided by the social group's members' behaviour patterns. These behaviours produce a set of beliefs and expectations, which in turn influence subsequent behaviours (Smolík, 2013). This notion identifies culture as a shared system that includes norms of behaviour, values, ways to communicate, etc., given the fact that people in one culture usually have similar customs (Liu M. , 2016).

The concept of culture is explained in many ways by scholars with varying approaches, which help to enlighten culture's many facets and perplexing subtleties. Stepin (2003) explains that culture is a system regulating life activities of human beings, while Makhmudova (2022) emphasizes its significant role in determining the behaviour of people and their consequences. Patterson (2014), explaining this further, describes culture as a result of knowledge structures and practical wisdom. In this vein, language, values, beliefs, customs, interpersonal expectations, and concepts that are shared within a group or community are referred to as 'culture'. Frequently, unspoken guidelines and standards decide whether members of a community or organization succeed or fail (Chirea-Ungureanu C. , 2015).

The concept of a cultural system encompasses the intricate web of beliefs, values, behaviours, norms, symbols, and practices that define a particular group of people. This cultural framework serves as a foundational backdrop against which individuals form their identity. Identity, in this context, is both a personal and social construct, shaped by how individuals view themselves within the broader cultural environment and how they relate to others. Smith and Bond (2010) articulate that identity emerges from this dynamic interplay, where cultural elements provide the context for self-perception and self-definition. The cultural system not only influences personal identity but also defines collective group identities, offering a shared sense of belonging and a reference point for understanding one's place within a larger community. By examining these interconnected aspects, we gain insight into how cultural contexts influence individual and group identities, shaping interactions and perceptions across diverse social landscapes.

When discussing the cross-cultural perspective, Rohner (1984) stresses the importance of differentiating culture from similar but not identical concepts. He emphasizes the necessity of establishing a common understanding about its theoretical basis.

Culture is a complex concept consisting of different levels and aspects. Triandis (2004), however, makes a distinction between surface elements like communication patterns and attitudes towards authority vis-à-vis more intrinsic ones such as basic beliefs or assumptions. Dumitrescu (2013) also supports this view, stating that culture should be seen in an adaptive manner particularly when viewed from a communication angle. In addition, Oyserman (2017) adds to the argument by exploring how culture organizes experiences, shapes thinking processes, and may lead to the destabilization of one's implicit cultural frames when encountering conflicting cultural perspectives.

The dynamic and multifaceted nature of culture underscores the importance of understanding its various dimensions. This awareness is particularly crucial for seafarers, as a lack of cultural empathy among crew members at sea can lead to interpersonal conflicts and other issues due to misunderstandings. Thus, addressing these delicate cultural points becomes imperative within the maritime context.

Furthermore, culture manifests in both overt and subtle ways within social settings, with explicit symbols such as language, religion, and attire serving as tangible markers of culture identity (Gamsakhurdia, 2020). Conversely, indirect manifestations shape communication practices, interactions, and problem-solving approaches, entrenched within societal structures and evident in organizational dynamics encompassing behaviour, ethics, motivation, communication patterns, conflict resolution strategies, and organizational change processes (also see (Williamson, 2007)). Additionally, culture significantly influences self-perceptions and establishes norms for creative expression (Shao et al., 2019).

In accordance with scholarly perspectives, culture can be characterized as a sociological framework encompassing the intellectual, artistic, and ritualistic legacy of human beings. This cultural inheritance is carefully crafted, upheld, and transmitted across successive generations, with the purpose of crafting a distinct and enduring group identity. Hofstede (2010) describes culture as the collective programming of the mind, encompassing shared values, beliefs, and practices, while Byram (1997) elucidates culture as the culmination of shared patterns of behaviour, understanding, and interaction within a community. Therefore, culture serves as the foundation upon which a group's unique identity is constructed, maintained, and passed down to posterity.

It is important to know how culture plays out among seafarers for better comprehension and cooperation in interacting with people who come from different culture backgrounds. The knowledge helps in understanding why certain practices and customs were developed, and it lays firm foundation for improving intercultural communication on board vessels. In this way, unity, effective communication and mutual respect can be reinforced through the acceptance of diversities such as culture identities among maritime personnel leading to a peaceful coexistence of individuals from various cultures aboard ships.

2.1.2 Cultural layers and levels

When studying culture, most researchers choose to break down this broad concept into layers and levels. The three major layers usually delineated are international, national, and subculture. Others define it in levels as the fundamental perspective to ease the study of culture conception (Spencer-Oatey, 2012).

One of the fundamental precepts of culture is that it consists of levels and sublevels. Regarding society there are five essential levels: national, regional, organizational, team, and individual. Inside every one of these levels, there are sublevels of culture.

In the context of larger society, a subculture is a distinctive set of particular rules, values, behavioural patterns, and lifestyles that define a particular group. The term "subculture"

refers to a particular group that, although contributing to the operation of larger society, is also the originator and keeper of its own unique, differing standards, values, patterns of behaviour, and lifestyles. Every time, a subculture's obvious differences from the dominant culture serve as an important indicator of that subculture (Smolík, 2013).

Within the larger culture, there are a wide variety of subcultures. When looking at a country, most people only see its main culture. However, if one looks further into its many states, they would discover numerous other cultures that are subcultures of the main culture. Subcultures are typically created to alter traditions that a group may disagree on, allowing them to maintain certain uniqueness while adhering to the cultural norms (Daniels, 2017).

The intricate texture of culture works at different levels and has various influences on the way in which a person behaves. Reiche, Carr and Pudelko (2010), and Karahanna, Evaristo and Srite (2005), among other scholars, emphasize that it is important to consider these different cultures from global to personal levels in order to understand their implications. According to Reiche, Carr and Pudelko (2010), *“cross-level links occur because change at one level can affect another”*. The authors suggest that globalization could induce changes in behaviour across different cultural contexts by showing us that there is such a thing as cultural dynamics. Also, Erez and Gati (2004) developed a dynamic multi-tier model of culture incorporating structural and dynamic features and argued that globalization triggers changes in behaviour across diverse cultural contexts (see Figure 3).

Figure 3: Levels of Culture (Source: Own Work)



Masouras Papademetriou (2014) highlights the relation between national culture and individual behaviour, as well as professional values. This being so, regional cultures embody the collective orientations of us about norms, customs and traditional things in a given area or society (Maseland & van Hoorn, 2017). Organizational cultures are circumscribed by institutions (Ahmmed R. , 2018). Contrastingly, team culture, as reflected in how each group member works together to achieve common objectives, has a significant impact on corporate performance (Rosemary, 2022). Lastly individual culture refers to personal experiences and interactions within various environments (Earley & Ang, 2003).

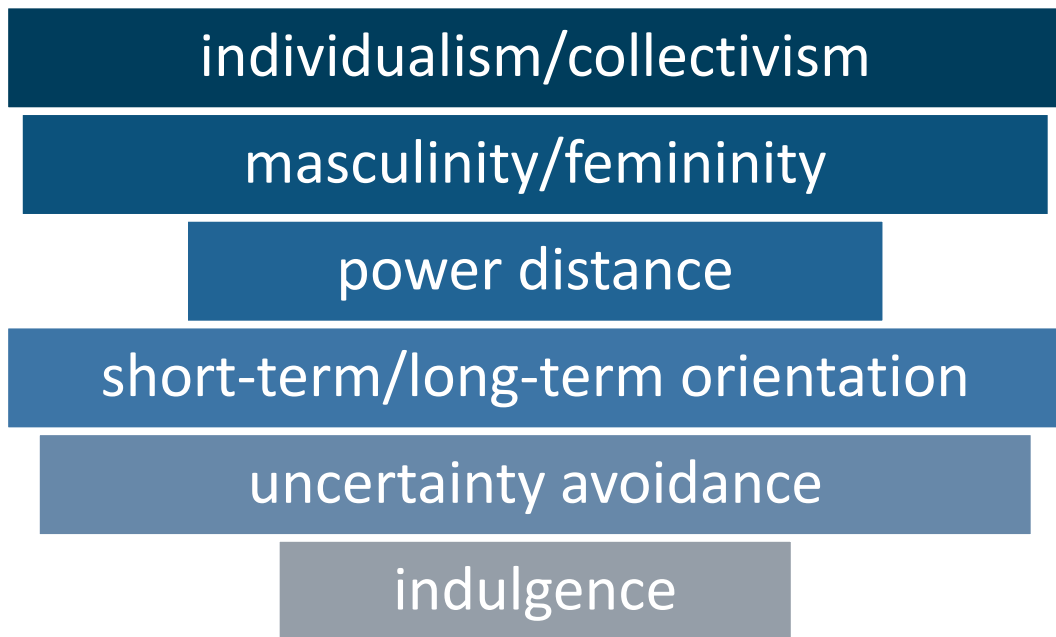
To comprehend the influence of culture, MET institutions need to include cultural awareness into their training programs for future seafarers in order to be best equipped for diverse maritime environments. By developing cultural competency, MET institutions will promote better communication, teamwork and adaptability among maritime professionals leading to a harmonized and inclusive seafaring community. Incorporating such profound understanding of cultural subtleties in training can enable upcoming seafarers to deal with different cultures confidently and respectfully.

2.1.3 Cultural characteristics

Culture is a multifaceted phenomenon that manifests distinct characteristics depending on geographical, historical, and social contexts. Siarapis (2017) provides an in-depth exploration of the factors affecting conflict in a culturally diversified workforce, offering a case study from the shipping company Sea Scope. This research highlights how various layers of culture, such as international, national, and subcultural dimensions, can lead to different forms of conflict and interaction within a workplace environment.

Building on this understanding, Hofstede's (2003) seminal study offers a comprehensive framework for analysing cultural characteristics through six primary dimensions: individualism versus collectivism, masculinity versus femininity, power distance, short-term versus long-term orientation, uncertainty avoidance, and indulgence versus restraint. Hofstede's model systematically explores how these dimensions reflect underlying cultural values, behaviours, and communication patterns, providing insights into the main cultural dilemmas encountered in intercultural interactions (Hofstede G. , 2003); see Figure 4). However, while Hofstede's framework is widely recognized and utilized, it has been critiqued for its potential oversimplification of cultural dynamics, reliance on data from a single multinational corporation, and the static nature of its cultural dimensions that may not account for evolving cultural trends. By applying this framework, researchers and practitioners can better grasp the complexities of cultural differences and navigate the challenges of working in diverse cultural settings.

Figure 4: Hofstede's Culture Dimensions (Source: (Hofstede G. , 2003))



The study emphasizes the necessity of deep understanding of cultural dimensions in intercultural education. This understanding enables individuals to identify and navigate cultural barriers and misconceptions that may arise when interacting with people from diverse cultural backgrounds. Grasping how factors like individualism/collectivism or power distance impact conduct and perspectives can enrich intercultural communication, instil appreciation for diverse viewpoints, and in the long run cultivate more effective and harmonious relationships in multicultural environments.

Furthermore, research carried out with the aid of (Kulkarni et al., 2010) (Basabe & Ros, 2005) (Lonner et al., 1980), accentuates the importance of these cultural dimensions in shaping cultural values and behaviours across numerous contexts. Cultural dimensions function as the foundation for designing intercultural training initiatives, supplying insights into the underlying elements fuelling intercultural tensions and misconceptions, and furnishing strategies to enhance cultural sensitivity, empathy, and adopt verbal exchange abilities amongst individuals hailing from numerous cultural backgrounds.

In summary, both Siarapis's exploration of workforce conflict and Hofstede's dimensions provide essential tools for understanding the variability of cultural characteristics and offer practical approaches for addressing cultural differences in various contexts.

2.1.4 Cultural attributes

According to Matera (2016), cultural traits are the distinctive characteristics, principles, beliefs, behaviours and practices that determine how people from a particular cultural

interact, communicate and see the world. Seychell, Dingli and Debono (2012) suggest that these attributes are formed by invisible aspects such as age, gender and nationality. Lindridge (2015) explores further the effect of culture on self-identity emphasizing how individuals behave given their cultural background. Culture also has an impact on how entrepreneurs behave as shown by Bucurean, Costin, and Marcu Bucurean (2011) stressing the need for shared values and beliefs in shaping a business entity's organizational culture.

The comprehension of cultural attributes is crucial in the context of the education of maritime students who will work closely with individuals from various cultures at sea (Ircha, 2006). However, developing intercultural competence among maritime specialists is a nuanced and continuous process requiring a multifaceted approach (Progoulaki M. , 2013). To overcome those challenges, maritime managers must possess the needed skills to understand and combine numerous cultures in the enterprise (Carol-Dekker, 2018).

The integration of subcultural attributes into maritime training is pivotal for augmenting intercultural competency and fostering effective communication, as underscored by Wang and Gu (2005). This assumes critical importance in numerous theoretical and shipboard environments wherein culture focus does not only increase academic performance but additionally enhances safety protocols (Horck, 2010).

2.1.5 Cross-cultural challenges

Many studies have found that managing multicultural teams can be challenging due to issues such as stereotyping, language barriers, and cultural differences. These challenges can hinder a manager's ability to integrate team members, adapt to diverse work styles, and operate effectively in a multicultural environment. The importance of being conscious of stereotypes and having a critical appreciation of diverse cultures to overcome such challenges is underscored by authors like MacNab and Worthley (2012) and Houghton et al. (2013). Additionally, the issue of language and cultural values in counselling is complicated as indicated by Lee (2016), Laungani (2004), Sue and Sue (1977) and Vontress (1969). Consequently, Denissova's (2020) study establishes that stereotyping affects communication, suggesting that they can both impede and promote understanding.

The recognition of stereotypes is a fundamental attribute for effective cross-cultural management (MacNab & Worthley, 2012). This skill can be honed through experiential learning and self-awareness, with context playing a pivotal role (MacNab & Worthley, 2012). Educators play a pivotal position in dispelling stereotypes via introducing essential cultural awareness amongst students (Houghton et al., 2013), delving into the nature of stereotypes and redressing them via intercultural education. In the area of cross-cultural

management, the imperative to avoid ethnocentrism and appreciate ethnic diversity is underscored (Chanlat et al., 2013).

Differences in lifestyles create significant challenges in managing people from different cultures. To overcome these challenges, people need to move away from a self-centred view and become more open and accepting (Chanlat et al., 2013). These divergences stem from culture and mental keystones, requiring the formula of strategies and techniques to navigate them (Steers et al., 2010). In a multicultural enterprise context, the recruitment and retention of diverse managers and the fostering of a corporate tradition valuing way of life heterogeneity are paramount (Fish, 1999).

Intercultural encounters on board multinational ships often involve complex dynamics, and while assimilation and adaptation are common, conflicts can still arise. An illustrative example is provided by Knudsen (2004), who highlights the interactions between Danish and Filipino seamen on Danish vessels. Despite general operational efficiency, underlying cultural and structural tensions frequently surface. Danish seamen value the Filipinos' friendliness, hard work, obedience, and sobriety, appreciating the high safety standards on board. Conversely, Filipinos typically feel secure and pleased to work on Danish ships due to these safety standards. However, disparities in employment terms create a marginalized position for Filipinos and a sense of job insecurity among Danes. These disparities often lead Danes to perceive a qualitative difference in work capabilities, which shipping companies do not always recognize, fostering a sense of unfairness and discrimination. Such perceptions can trigger a self-fulfilling prophecy, where preconceived notions about work abilities result in passive resistance and further misunderstandings.

A specific example of intercultural breakdown is when Danish crew members, frustrated by what they perceive as a lack of initiative from Filipino colleagues, may unconsciously ignore their suggestions, reinforcing a cycle of miscommunication. Conversely, Filipinos, accustomed to hierarchical respect, may hesitate to voice concerns, exacerbating the issue (Knudsen, 2004).

Research has consistently shown that proactive conflict resolution mechanisms, such as mediation and clear communication channels, are crucial in reducing intercultural tensions on board ships (Ertürk & Sağlam, 2021); (Noble et al., 2011); (Inegol & Yildirim, 2024)). These tensions often arise from conflicts between crew members and ship management, superiors and subordinates, and among crew members, with reasons including unpaid wages, inadequate working conditions, abuse of power, and ethnic differences (Ertürk & Sağlam, 2021). Effective communication, both verbal and non-verbal, is key in addressing these tensions and creating a harmonious working atmosphere (Noble et al., 2011). The importance of understanding and managing cultural differences in a multicultural crew cannot be overstated, as these differences can lead to conflicts that endanger the safety of the ship and its cargo (Inegol & Yildirim, 2024).

To mitigate such conflicts, effective leadership that fosters open communication and mutual respect is crucial. Structured cultural competence training for all crew members can help bridge understanding gaps and promote empathy. Additionally, creating mixed-nationality teams for specific tasks can enhance collaboration and reduce the perception of competition. These strategies, supported by recent research, highlight the necessity of proactive conflict resolution and effective communication in maintaining a cohesive and safe working environment on board ships.

Cross-cultural management is not only fraught with numerous and various challenges (see Figure 5), but also limitations. This shows that it is essential to integrate intercultural management into Maritime Education and Trainings' curricula. Therefore, MET' academic staff can teach college students how to operate in a culturally diverse, globalized labour force and develop competences, such as cultural literacy, communication skills, and eventually successful intercultural relations. In addition to promoting students' academic and professional progress this strategic educational move could also correspond to contemporary interconnected and diversified business environments that prepare them for future leadership positions.

Figure 5 : Examples of Cross-Cultural Management Challenges (Source: Own Work)



2.2 Understanding communication and overcoming communication challenges faced by seafarers

Effective communication is paramount for the smooth and secure operation on vessels, but it frequently encounters roadblocks stemming from linguistic, subcultural, and interpersonal barriers, (Suresh & Krithika, 2022), (Fan et al., 2015) and (Wang & Gu, 2005). These hurdles are accentuated in the maritime region, where individuals from several backgrounds collaborate (Fan et al., 2015).

In this context, Maritime English plays a crucial role. This specific register of communication, vital on board ships, requires a unique treatment (Pejaković, 2014) and (Kovacevic, 2014). It's not just a matter of language proficiency, but an essential tool for safety at sea as it standardizes language and ensures precise, unambiguous communication (Rodinadze et al., 2011).

The functional aspect of Maritime English is also critical, as it enables effective interpersonal and cross-cultural communication, facilitating tasks on board and interaction with shore services (Čulić-Viskota A. , 2005) . Proficiency in Maritime English, which includes specific terminology and communication protocols essential for safety and operational efficiency, becomes a necessity for seafarers. This specialized form of English helps to transcend linguistic boundaries, promoting overall safety and efficiency in maritime operations.

The inclusion of overseas labour within the fishing fleet, as an instance, has underscored the need of deploying effective communication strategies to uphold safety requirements (Thorvaldsen & Sønvisen, 2014). In tackling those boundaries, incorporating traditions into maritime English instruction is crucial (Wang & Gu, 2005), alongside the creation of specialized programs and orientations for seafarers to enhance their interpersonal conversation competencies (Suresh & Krithika, 2022).

In conclusion, effective communication in the maritime sector requires a multifaceted approach that includes the proficiency in Maritime English, understanding of cultural nuances, and continual development of interpersonal skills. This comprehensive approach ensures the smooth operation of vessels while safeguarding the safety and efficiency of seafaring operations.

2.2.1 Communication

Indeed, as Prabavathi and Nagasubramani, (2018) note, communication is fundamental to the exchange of information and therefore an integral part of all human interactions. Communication also comes in different forms such as verbal, non-verbal or written which manifest in various ways (Mallett-Hamer, 2005). Moreover, it is non-verbal

communication that is increasingly being recognized as a powerful way of transmitting messages to people in addition to verbal one (Burns, 1980). For effective communication between persons there must be mutual understanding by both the sender and the receiver which are usually intricate and multifaceted processes (Page, 1984). In workplaces, communication assumes a critical role for dissemination of ideas and information with its effectiveness directly impacting on overall satisfaction levels (Mallett-Hamer, 2005).

2.2.2 Language

As a Master Mariner, I have observed first-hand the multifaceted nature of language use on board ships. On the bridge, Maritime English serves as the primary mode of communication, particularly during operations involving the VHF radio, where Standard Marine Communication Phrases (SMCP) are employed to ensure clarity and precision. This practice is crucial for maintaining safety and operational efficiency, especially when coordinating with shore services and other vessels. However, among crew members who share a common native language, there is a tendency to revert to their mother tongue during informal interactions and non-critical tasks. In situations where the crew is composed of individuals with different native languages, English often functions as a 'bridging' language, facilitating communication and mutual understanding. This dynamic use of language underscores the necessity for seafarers to be proficient in Maritime English while also being adaptable to the multilingual environment on board. Alison Noble's (2018) doctoral dissertation highlights these practical aspects of language use, emphasizing the feasibility and desirability of setting global standards for Maritime English to enhance communication and safety across the maritime industry (Noble A. , 2018).

Language is mainly considered one of the most important tools that ensure the effective communication between individuals, regardless of their cultural differences. Moreover, language also contributes to the culture of given societies by enriching their heritage. This notion emphasizes the significance of language as a social facet that needs to be preserved (Fransisca et al., 2022).

The relationship between language and culture is a complex and multifaceted one, with both influencing and shaping each other. Musafir (2021) emphasizes the close correlation between the two, with culture directly impacting language. Kövecses (2010) further explores this connection, highlighting various concepts that demonstrate the interrelations between language and culture. Guessabi (2021) adds to this discussion by emphasizing the role of language in conveying culture and the necessity of different languages in preserving cultural heritage.

Communication and preventing maritime mishaps require a common language. When working in the port and shipping industries, seamen and maritime professionals speak maritime English. When accidents are analysed, it becomes clear that cooperation and communication breakdowns frequently cause accidents. Therefore, the maritime safety and English proficiency are intertwined. Good command among seafarers virtually eliminates miscommunications (Ahmmed M. , 2018).

Positive cross- cultural experiences seem to improve learner's success and levels of happiness as well as skill in English as a common language (Pazaver&Kitada, 2018, p.2). The use of the English language in maritime shipping has a noticeable impact on issues related to safety, open dialogue, obeying orders, and the opportunity for learning new things (Smirnov & Kondratiev, 2016).

The standards state that mariners must be fluent in both oral and written English. This seems like a reasonable requirement considering that English is the predominant tongue on ships. Language plays a vital role in preventing injuries and mishaps, especially in interpersonal communication (Belle, 2020).

The English language's dominant status in shipping has undoubtedly facilitated maritime operations, but if crew members' cultural backgrounds are not taken into consideration, the gap between them could grow rather than be closed (Čulić-Viskota M. , 2018).

2.2.2.1 The concept and significance of intercomprehension in modern language learning

Intercomprehension, a practice of linguistic and cultural exchange, is a critical component of plurilingualism and reflects a significant shift in language teaching methodologies over recent decades (Menezes, 2021). This approach recognizes that communication is not solely reliant on proficiency in a single language but can also thrive through the understanding of similarities and differences among multiple languages (Hülmbauer & Seidlhofer, 2013).

Historically, the field of foreign language teaching has evolved from a focus on rigid grammatical structures to more communicative and interactive methods. Since the 1970s and 1980s, language teaching shifted from structural approaches that emphasized language form to communicative approaches focused on conveying and interpreting meaning (Widdowson, 1983). By the 1990s, task-based teaching emerged as a paradigm that emphasized exposure to and use of naturalistic language in meaningful contexts ((Prabhu, 1987); (Skehan, 2003)). This shift marked a move from viewing language instruction as a mere transmission of knowledge to an interactive and participatory process (Long, 1998).

In this evolving educational landscape, the concept of Intercomprehension has gained prominence as a way to bridge linguistic gaps and enhance communication among speakers of different languages (Menezes, 2021). Rather than seeing languages as isolated systems, Intercomprehension promotes a holistic view that leverages the relationships between languages to facilitate understanding (Bono & Melo-Pfeifer, 2008). This perspective aligns with a broader trend in sociolinguistics towards recognizing the dynamic and interconnected nature of linguistic and cultural practices (Vertovec, 2007); (Blommaert & Rampton, 2011)).

In higher education, Intercomprehension is increasingly integrated with concepts of interculturality and internationalization. This integration highlights the role of Intercomprehension in addressing the dominance of English as a global lingua franca and emphasizes the need for strategies that accommodate plurilingual interactions (Guimarães & Finardi, 2018). By focusing on the similarities between languages rather than their differences, Intercomprehension helps learners develop a more nuanced understanding of linguistic diversity and promotes effective communication in multilingual settings (Schriever, 2011).

2.2.2.2 The application of intercomprehension in multilingual contexts

Despite the critical role of English as a lingua franca aboard ships and in other global contexts, its use does not eliminate all communication barriers (Schriever, 2011). Multilingual crews, for example, often encounter challenges arising from varied language proficiencies and cultural backgrounds (Sampson & Zhao, 2003). The concept of Intercomprehension offers valuable insights for addressing these challenges by encouraging a plurilingual approach that embraces the full spectrum of linguistic resources available to individuals (Hülmbauer & Seidlhofer, 2013).

Intercomprehension involves not only the ability to understand and interpret different languages but also the capacity to navigate and bridge linguistic and cultural gaps through effective communication strategies (Alibec, 2023). It emphasizes the importance of recognizing and utilizing the shared features of languages to facilitate mutual understanding and collaboration among speakers from diverse linguistic backgrounds (Moore et al., 2009).

Moreover, Intercomprehension supports the development of plurilingual competence, which encompasses the ability to draw on multiple languages and cultural experiences to achieve communicative goals (Bono & Melo-Pfeifer, 2008). This competence is built through transversal, metalinguistic, and metacognitive processes that enable learners to activate their entire linguistic repertoire, discern language phenomena, and adapt their communication strategies (Beacco et al., 2010).

The concept of Intercomprehension represents a significant advancement in language teaching and learning, reflecting a shift from traditional, structure-based approaches to more dynamic, communicative methodologies. By focusing on the relationships between languages and fostering plurilingual skills, Intercomprehension offers effective strategies for overcoming communication barriers in diverse linguistic contexts (Menezes, 2021). Its application in European language policies and educational practices demonstrates its potential to promote social cohesion, cultural diversity, and effective communication across multiple languages (Santos Alves & Mendes, 2006); (Guimarães & Finardi, 2018).

As language learning continues to evolve, Intercomprehension provides a valuable framework for addressing the complexities of global communication and enhancing the effectiveness of multilingual interactions (Schriever, 2011); (Hülmbauer & Seidlhofer, 2013).

2.2.3 Communication in the maritime industry

Communication plays a significant role in promoting the maritime domain. It is through this concept that ideas can be shared and information passed among the crew, officers and other stakeholders (Sharma N. D., 2010). Perhaps most important of all within this context is the importance of clear and positive safety communication, which helps in averting at-risk behaviours and enhancing safe work practices (Vecchio-Sadus, 2007). Moreover, personalizing one's own communication approach with effective intercultural and interpersonal communication strategies may further career advancement and leadership acumen.

In the maritime industry, communication extends beyond professional interactions to encompass the social dynamics of living on board. Seafarers and maritime professionals not only work together but also share living spaces, making effective social communication crucial for their wellbeing and cohesion. This unique aspect of maritime life distinguishes it from other professions. Communication in this context is relational and context-dependent, fostering trust and mutual understanding among crew members. Addressing these interpersonal and social needs is essential for maintaining morale and safety on board.

Intercomprehension plays a vital role here, as it is not solely about language acquisition but also about building confidence and trust among seafarers. IC refers to the ability to understand a language without having formally studied it, leveraging similarities to one's native language. This approach, as highlighted by Lungu and Cizer (2013), complements traditional language learning and promotes multilingualism. The study, in particular, emphasizes the importance of Intercomprehension in maritime education, demonstrating how it facilitates better understanding and cooperation among seafarers from diverse

linguistic backgrounds. This method enhances not only language skills but also the overall interpersonal dynamics crucial for effective and safe maritime operations.

On board isolated and dangerous sea-going vessels, effective communication emerges as a crucial resource (See STCW Manila Amendments 2010, Article 18). According to the Manila Amendments, Member States are required to ensure various aspects of on-board communication. This includes the provision of means for effective oral communication relating to safety among all members of the ship's crew, particularly for the correct and timely reception and understanding of messages and instructions (Manila Amendments, Article 18(a)). Furthermore, on passenger ships, personnel designated to assist passengers in emergency situations must be readily identifiable and possess communication skills adequate for their role (Manila Amendments, Article 18(c)). This includes the recognition that a basic ability to use elementary English vocabulary can facilitate communication between crew members and passengers in need of assistance, even when no common language is shared (Manila Amendments, Article 18(c)(ii)). Additionally, adequate means for communication between the ship and shore-based authorities are required, conducted in accordance with SOLAS 74 regulations (Manila Amendments, Article 18(e)). These provisions highlight the importance placed on effective communication in ensuring the safety and security of maritime operations.

Another essential is having a solid understanding of communication and how to use it effectively in different settings. For instance, because both parties can see one another, communication may be established and maintained effortlessly when working on a straightforward deck repair for instance. On the other hand, when a confined space inquiry is necessary, good communication is crucial for the task's safety and completion (Belle, 2020).

Rockwood and Nathan-Roberts (2018) emphasize the importance of clear and efficient communication to scattered crews, calling for shared mental models to be updated, transmission delays mitigated, appropriate communication protocols or technologies used.

The necessity of addressing linguistic diversity on board ships is paramount to ensuring smooth operations and safety. Thorvaldsen and Sønvisen (2014) argue that multilingualism on Norwegian fishing boats significantly affects crew members' job experiences. They highlight that language hybrids, which combine elements from multiple languages, effectively help fishers overcome linguistic barriers. This is crucial because it facilitates more inclusive communication, allowing crew members from diverse linguistic backgrounds to collaborate effectively. Furthermore, Lützhöft, Lundh, and Porathe (2013) emphasize the need to optimize communication among seafarers and between ships, especially as crew sizes decrease and voyage management becomes more streamlined. They assert that effective communication is vital for ensuring all crew members,

regardless of their native language, can understand and perform their tasks accurately. Therefore, these strategies must be integrated into maritime operations to enhance efficiency and safety, demonstrating the critical importance of linguistic adaptation in multicultural crew settings.

From there, Blizard (2012) directs attention to the need for unceasing constructive talk within any business performance, which he admits is indispensable in enhancing productivity rates and achieving targets.

The maritime landscape is one where there are differences in language and diversity in culture, which necessitates effective communication for safe vessel operations (Wang & Gu, 2005); (Suresh & Krithika, 2022). The field of Maritime English education and training faces numerous challenges due to the presence of multicultural crews utilizing multiple languages onboard ships (Fan et al., 2015). As a result, it is imperative to embrace a comprehensive approach to teaching communication skills. This approach should encompass linguistic proficiency, cultural understanding, and soft skills development to enhance safety measures and performance in the maritime sector.

2.2.4 Communication barriers

Cross-cultural communication barriers, encompassing elements like anxiety, uncertainty, stereotyping, and ethnocentrism, wield a profound influence on international business exchanges (Jenifer & Raman, 2015). These hurdles are often exacerbated by language discrepancies and entrenched obstacles, underscoring the necessity of empathy and tolerance in surmounting them (Junfang & Yu, 2013).

Misunderstandings in cultural variation of verbal and non-verbal communication can cause lack of trust and unity (Qin, 2014); (Ntuli, 2012); (Kaur J. , 2011); (Nelson & Baumgarte, 2004). Such misunderstandings are often extremely explicit in intercultural communications where the cultural perspectives diverge and lead to a decrease in empathic responses (Nelson & Baumgarte, 2004). Cultural influence on various elements of communication such as roles, places, times, audiences and texts can also give rise to misunderstandings (Qin, 2014).

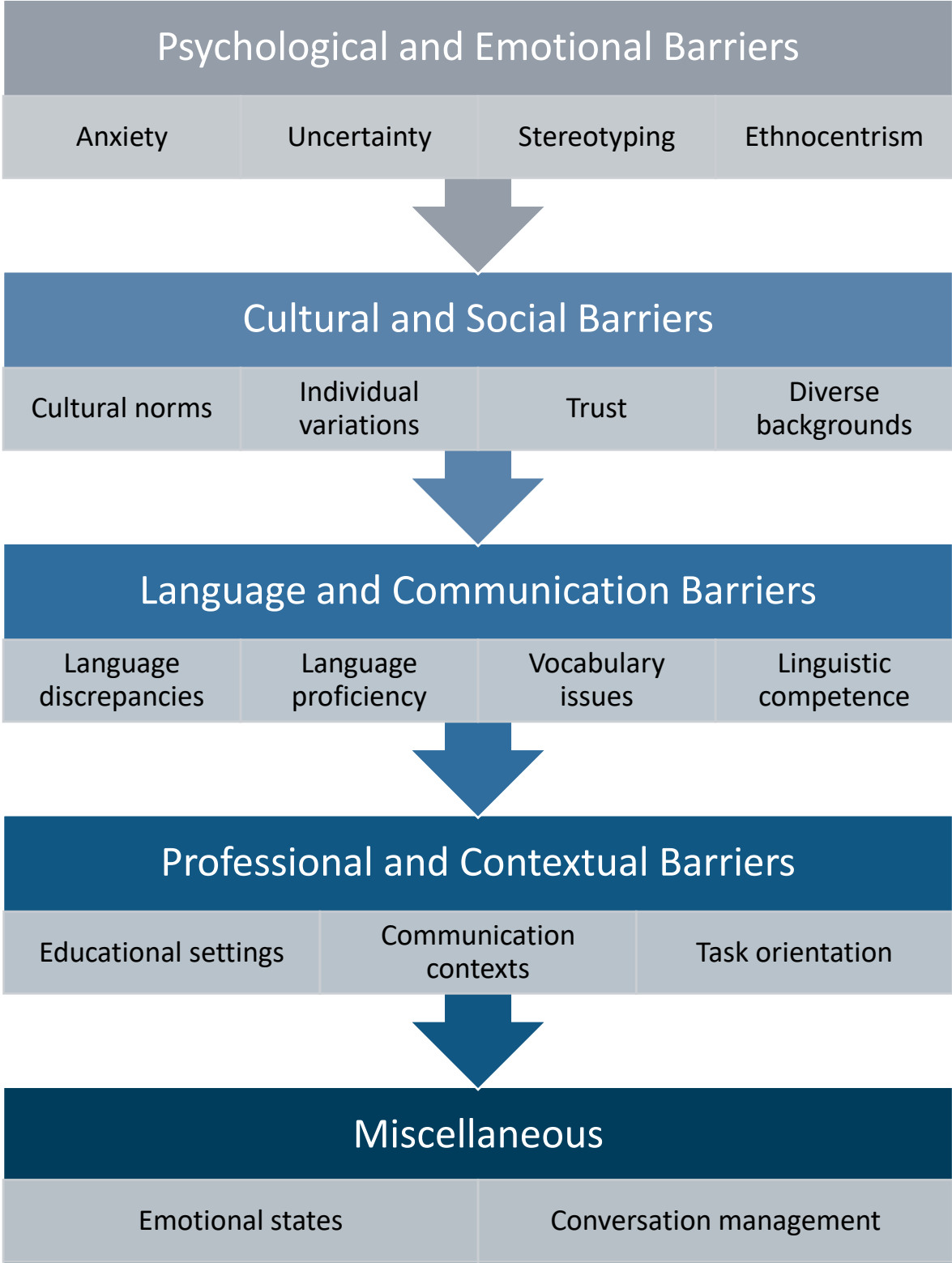
Language barriers challenge effective communication due to differences in proficiency levels among speakers (Abuarqoub, 2019). In educational settings, language obstacles encountered by English language learners often stem from issues like vocabulary comprehension, grammatical nuances, psychological barriers, and inappropriate teaching methodologies (Pipchenko & Kovtunenکو, 2020). Divergent nonverbal communication norms across cultures can precipitate misunderstandings (Wang & Li, 2007).

These discrepancies are most pronounced in the interpersonal interpretation of behaviours related to conveying emotional states and managing conversations (Novita, 2012)(as cited (LaFrance & Mayo, 1978)). For instance, distinct nonverbal communication styles between Latino and Anglo cultures can give rise to potential misinterpretations (Cruz, 2001). Additionally, gender differences in nonverbal communication, encompassing the transmission and interpretation of nonverbal cues, are shaped by cultural norms and social learning processes (Hall, 1984). Cultural values serve as significant influencers of communication styles, with Eastern societies favouring indirect and context-dependent communication, while Western societies lean towards direct and explicit forms of communication (Guo, 2020).

Nonetheless, individual variations in communication styles often outweigh cultural distinctions (Park et al., 2012). These discrepancies manifest in various forms of communication, such as email correspondence, where cultural backgrounds impact factors like formality, timeliness, precision, task orientation, and relationship building (Holtbrügge et al., 2012).

Exploration of power dynamics and hierarchical structures across cultures unveils notable variations in how power and status are perceived and acquired (Torelli et al., 2020). Power in individualistic cultures tends to be associated with personal traits and abilities, whereas in collectivistic cultures, it is often socialized and influenced by qualities like empathy and competence. These variations can have a significant effect on communication dynamics with the prevalence of authority, deference and formal communication norms in hierarchical societies (Morand, 1996). In these dynamics, one of the key factors is the impact of power distance on leadership behaviours and styles (Ismayilov & Eriksson, 2011).

Figure 6: Examples of Communication Barriers and Variations (Source: Own Work)



Cross-cultural communication barriers (see Figure 6) must be recognized and dealt with due to their influence in various aspects of international business as highlighted by Jenifer and Raman (2015). Jenifer's and Raman's findings are reinforced by Gašpar, Podrug, and Aleksić (2023), who highlight the substantial influence of these barriers on organizational communication. Those authors stress the need for intercultural competence and the development of digital tools to overcome these barriers. Language and empathy emerge as key obstacles, as identified by Junfang & Yu (2013), while Yong-Che (2003) advocates for a cultural self-awareness approach to enhance intercultural communication proficiency. This figure aims to provide examples of such barriers rather than presenting an all-encompassing list. The visual representation serves to highlight key issues and prompt further exploration of strategies to overcome these challenges in cross-cultural settings.

2.2.5 Communication competence

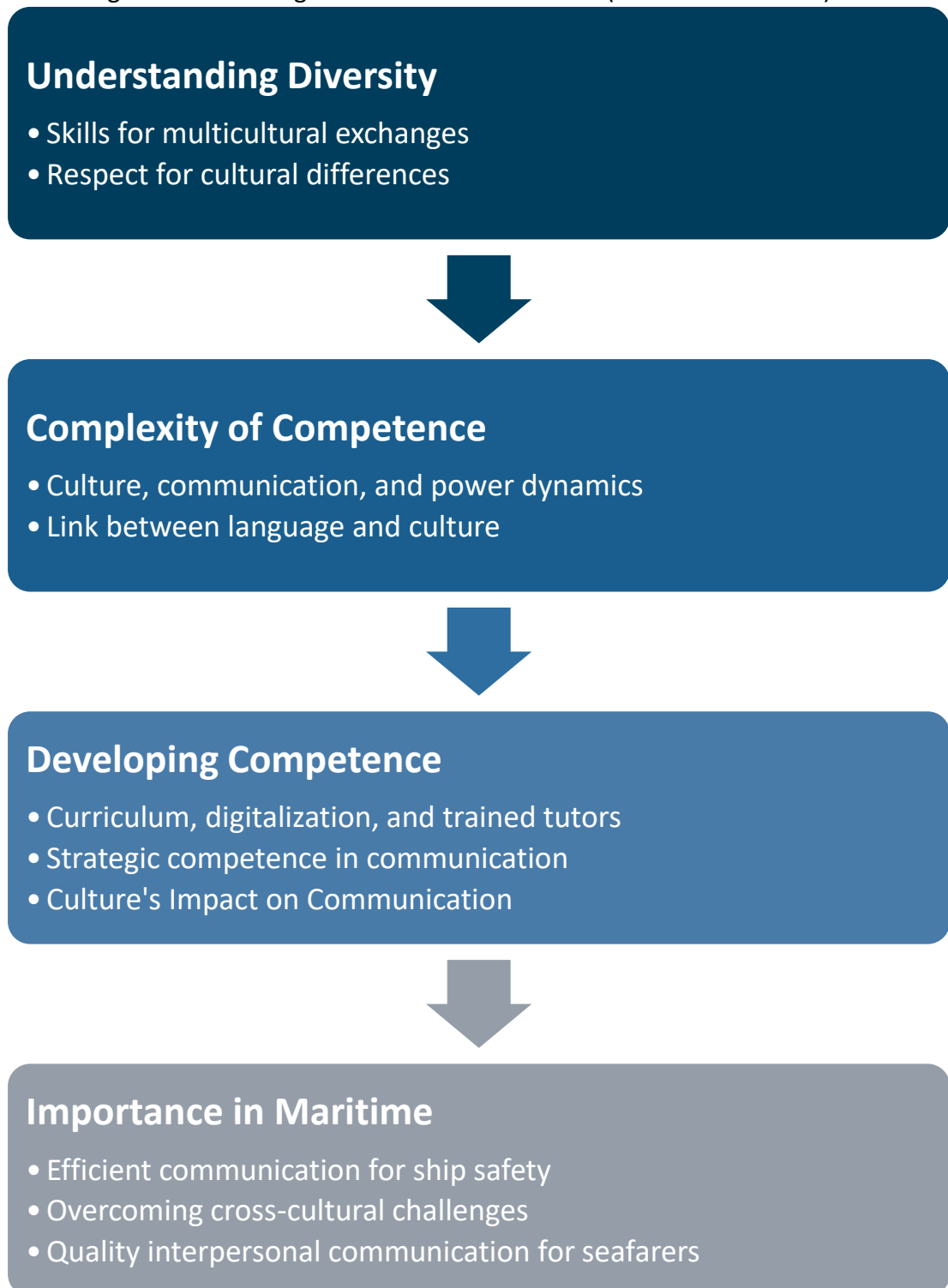
Ilie (2019) argues that in today's world, which is characterized by diversity, it has become imperative to develop attitudes and skills for multicultural exchanges. However, intercultural communication competence requires an in-depth analysis of cultural, communication and power dynamics, making the concept complex (Collier, 2015). Language and culture are closely related to this particular competence since without the knowledge of the former cannot fully understand the latter (Tashmatova, 2021). Furthermore, Samifanni and Gumanit (2021) highlight that cultural actualization, syllabus development, digitalization, and well-trained tutors must be interdependent in order to develop intercultural communication competence.

The intricacies of this important field are pointed out by Leonard, Van Scotter and Pakdil (2009) and Durant and Shepherd (2009) who emphasize the effect of culture on communication processes, especially media's effectiveness and possibilities of cultural convergence in intercultural communication. Li-sheng (2000) further stresses that strategic competence is highly critical to intercultural communication, which is a significant part of communication competence. These perceptions combined highlight the crucial role played by culture in shaping communication patterns with more need for investigations on this area.

In conclusion, the importance of effective communication in the maritime cannot be overemphasized. Evidence indicates that there is a need for effective communication in the protection and safe operation of ships (Suresh & Krithika, 2022); (Rodseth et al., 2013); (Wang & Gu, 2005) and (Goulielmos & Tzannatos, 1997). Additionally, it is critical to appreciate how the challenges posed by cross-cultural communications necessitate seafarers' language and cultural skills as pointed out by Wang and Gu (2005). At this point in time, Suresh and Krithika (2022) assert that quality interpersonal communication is a crucial aspect that affects the effectiveness and safety of seafarers as individuals. All these studies put together highlight the central role of competent communication in

maritime industries towards enhancing overall safety, efficiency (see Figure 7), and success of any voyage on sea.

Figure 7: Enhancing Maritime Communication (Source: Own Work)



2.2.6 Cross-cultural communication skills

Cross-cultural or intercultural communication abilities are essential for success in today's global workplace. Verbal communication is one of the most effective ways for individuals to share information and ideas, and it is even more effective when it occurs across cultural and socioeconomic divides. However, non-verbal cues like body language and other aspects also play a role in communication. Therefore, acknowledging these characteristics is necessary for intercultural communication to succeed in a multicultural workplace (Daley, 2020).

Possessing effective cross-cultural communication skills displays the capacity for negotiation and interaction. Speaking, writing, and reading are all instructional techniques that support the development of intercultural communication skills (Chirea-Ungureanu & Rosenhave, 2016).

Maritime industries must therefore implement cross-cultural communication that will ensure safety and success. In maritime industries, there is an increasing need to manage cultural and linguistic diversity in crews (Noble et al., 2011). This has necessitated standardized training and education to address these challenges with regard to cultural dimensions and adjustment problems associated with cross-cultural settings (Ircha, 2006). Cross-cultural employability skills of graduates in maritime business also point out how crucial it is for such individuals to be adaptable and communicate effectively especially at this time when digitalization and automation are taking place (Chen et al., 2018).

The value of preparing seafarers in effective interaction approaches and civilization understanding is brought to the forefront by a number of researchers. Communication skills with emphasis on soft skills is vital for effective team work and relationships on board ships (Noble et al., 2011). This becomes more important in cross-cultural communication, where linguistic competency and cultural issues matter greatly (Wang & Gu, 2005). Cultural competence is necessary for maritime professionals, which calls for teaching from a more humanistic perspective (Chirea-Ungureanu & Rosenhave, 2012).

The difficulties associated with maritime English education and training (particularly multilingualism and multiculturalism) are also mentioned (Fan et al., 2015). These difficulties often stem from the lack of proficiency in Maritime English among seafarers, which can hinder effective communication and pose safety risks in maritime operations. Additionally, navigating communication barriers arising from diverse linguistic and cultural backgrounds onboard ships further complicates the training process. Addressing these challenges requires comprehensive approaches that enhance linguistic proficiency, cultural competence, and communication skills tailored to the maritime context. This can be achieved through the development of intercultural management skills (Vişan et al., 2012), the improvement of communicative competence (Fan et al., 2015) and the

incorporation of intercultural approaches in English language teaching (Kondratiev et al., 2016). Furthermore, the focus of English language training should be on developing spoken fluency and understanding English spoken with a range of international accents (Ghetu & Rusei, 2013).

As a result, the integration of intercultural communication competence into the standard curriculum for MET institutions is crucial for preparing future maritime professionals to navigate diverse cultural environments effectively (Sirbu, 2023) and (Horck, 2006). This is particularly important in the context of the maritime industry (see Figure 8), where multicultural crews are increasingly common (Horck, 2006). The need for such integration is further underscored by the role of effective communication in ensuring safe and successful maritime operations (Wang & Gu, 2005).

Figure 8: Importance of Intercultural Communication in MET Curriculum (Source: Own Work)



2.3 Challenges in teaching and learning intercultural communication and competence in maritime education

The teaching of intercultural communication and competence at MET institutions entails complex challenges. Fan, Fei, Schriever, & Fan's (2015) research shows the need for improved levels of maritime English fluency within countries, where English is not the mother tongue. Horck (2010) highlights the importance of cultural knowledge and good communication skills in a diverse maritime context, both in educational institutions and on ships. Baylon, Ma and dos Santos (2011), on the other hand, offer an insight into the global relentless demand for competent seafarers, which relates to the obligation of complying with revised STCW Convention and Code; additionally, their analysis points out that new markets have emerged with growing numbers of east-European companies taking up traditional jobs from west-European shipping owners. In addition, according to Horck (2006), safety implications of having mixed crew composition are far reaching, hence there should be structured training programs in cultural sensitivity and communication methods among various people working together at sea.

In conclusion, all these studies collectively recommend comprehensive language and cultural enhancement programs that would cater for changing needs in this industry, thereby delivering competent seamen who can compete with others worldwide.

2.3.1 Teacher of intercultural communication competence

Teachers who are effective at intercultural communication and competence have various core attributes. Teachers who possess both linguistic and cultural knowledge (Nazarenko, 2015) are instrumental in addressing potential communication barriers within culturally diverse classrooms. By being skilled communicators with cultural proficiency (le Roux, 2002), they can effectively bridge differences and enhance understanding among students from varied backgrounds. These teachers capture the essence of intercultural communication in the educational process thus using it for improvement of students' professionalism and personal traits including intercultural competency and ethnic tolerance (Orekhova, 2021). Indeed, successful teachers of intercultural communication and competence go beyond language impediments to foster appreciation for other cultures and enhance their students' ability to relate with people from different backgrounds.

Stay (2000) stresses the importance of developing intercultural competence for educators in a multicultural society. This competence includes skills such as empathy, attentive listening, positive attitudes towards other cultures, and a willingness to learn from different situations. Besides, DeJaeghere and Cao (2009) argue that teacher professional development programs can enhance their intercultural competence especially in relation to behaviour modification. In addition, Davis and Cho (Davis & Cho, 2005) emphasize that

educational technology can be used to foster intercultural competency by promoting openness, adaptability and embracing multiple perspectives.

In brief, proficiency in intercultural education is necessary for students to have a future in an increasingly globalized world. Educators employ their familiarity and communication expertise to augment students' professional and personal abilities, intercultural understanding, and forbearance. Mastering intercultural competence is important for teachers when dealing with multicultural problems which demand qualities like compassion, being an active listener and willingness to try new things. Constant training and use of technology among educators can increase their knowledge of multicultural skills. This enables educators to build inclusive learning environments that empower learners globally. Addressing cultural bias and fostering an emerging intercultural identity are crucial components of this process. By acknowledging and overcoming these biases, educators can better support the development of students' intercultural understanding and competencies, preparing them for success in a globalized world.

2.3.2 Student of intercultural communication competence

The process of learning intercultural communication and competence is complex. It involves navigating through differences in culture, stereotypes, language barriers, ethnocentrism, emotional ineligibility, and adoption of other cultures. Beamer (1992) introduced a framework that highlights the need to challenge stereotypes as well as analyse communication situations. Taylor (2007) examines third places where new cultural perspectives are developed through cross-cultural interactions. This perspective takes the stance that culture constantly changes hence one must explore his/her linguacultural background and remain open to different identities and opinions. Chen and Starosta (1996) emphasize the significance of juggling many identities within an increasingly interconnected world community which will entail rethinking what constitutes intercultural communication competence research.

Cultural self-awareness must be raised to enable people to acknowledge and deal with cultural-driven assumptions, proposed Kraemer (1973). Cultural metacognition, particularly cultural perspective-taking in practice (Mor et al., 2013), is the most significant aspect of successful cross-cultural collaboration. Recognizing and accepting diverse cultural values is the basis for promoting intercultural interactions in educational contexts (Varney & Cushner, 1990).

Various studies have explored the development of intercultural competence in diverse educational settings. Calleja (2009) stresses the significance of considering learners' unique traits in intercultural communication education. Shih (2017) presents a structured instructional design for intercultural communication courses, incorporating pre-connection training and discussions. Aguilar (2010) highlights the role of intercultural

communication competence in fostering independent learning, focusing on attitude values and critical cultural awareness development. Wang T. (2017) introduces an intercultural dialogue framework for global teaching and learning, emphasizing culturally sensitive teaching methods, tailored curriculum, and supportive learning environments.

Composed, these studies underscore the necessity of personalized, culturally attuned strategies for cultivating intercultural competence.

2.4 Examining the integration of intercultural competence and communication in the educational curriculum at MET institutions

MET institutions are important in preparing people for maritime careers. Boonadir, Ishak, Yusof, and Lamakasauk (2020) and Kim (2002) have highlighted the importance of good quality academic programs and incorporation of simulators into MET. Edirisinghe, Zhihong, and Lixin (2016) propose a model to improve the competitiveness and quality of MET institutions. In his work, Manuel (2017) discusses the trend towards amalgamating vocational with academic approaches in MET, which pose some issues and opportunities in curriculum planning and achievement of learning objectives.

In MET institutions, Manuel (2017) points out that the courses are designed in ways that meet today's changing patterns of integrating vocational education with academic content. This approach is enhanced further by the use of ship handling simulators (Kim C.-J. , 2002) and top-class technology (Muirhead, 2004), to prepare students for a well-rounded and competitive curriculum. Moreover, it is important to consider the impact of simulation fidelity on maritime training. Renganayagalu, Mallam, Nazir, Ernstsén, and Haavardtun (2019) stress that high-fidelity simulations can greatly enhance maritime training students' self-confidence and skill development. These realistic training scenarios provide students with practical experience and a better understanding of real-life maritime challenges, thereby improving their competence and preparedness for actual maritime operations.

These research articles jointly underscore the need for sustainable improvement as well as creativity in MET to serve changing demands within this industry.

2.4.1 Model courses and STCW

In MET institutions, the concept of a model course is important for ensuring quality and standards in programs, with these model courses consistently provided by the IMO. Edirisinghe, Zhihong, and Lixin (2016) present a systematic approach to MET institutions that gives strategic elements like college reputation and employment opportunities their due. Baldauf, Schröder-Hinrichs, Kataria, Benedict, and Tuschling (2015), on the other hand, focus on team training, safety and security; however, there is an emphasis on practical experience necessary for it. Muirhead (2004), in the context of his time, discussed the influence of new technology on MET institutions and emphasized the importance of rational planning and sustainable growth. While the reference is from 2004, it provides insights into historical perspectives on technology in maritime education and training. It's important to consider the advancements and changes that have occurred since then when evaluating the relevance of these discussions in a contemporary context. Kitada (2022) also highlights the role of MET institutions in developing skills for the future of the maritime world, particularly within the context of

the significant technological advancements and changes in the industry often referred to as the Fourth Industrial Revolution.

The Fourth Industrial Revolution, also known as Industry 4.0, is characterized by the integration of digital and physical technologies, such as the Internet of Things and artificial intelligence, into various aspects of society (Xu et al., 2018). The transformation brought about by the Fourth Industrial Revolution is expected to revolutionize work, creating a need for a balance between technological innovation and new employment concepts (Ross & Maynard, 2021).

Doumbia-Henry (2003) argues that while the STCW Convention was initially intended to establish minimum training and certification standards for seafarers worldwide, it has become a crucial international treaty. Originally focused on enhancing mariners' competence to reduce human errors and marine accidents (Bobb, 2000), the Convention's objectives should evolve to address current needs effectively.

It is not merely advisable but rather a compulsory and critical component of maritime education curriculum that MET institutions integrate STCW standardized courses. In the recent past, Pipchenko's study in 2020 shows how integrating STCW standards has raised the relevance, comprehensiveness and consistency of training programs making them fit to prepare students sufficiently for successful maritime careers (Pipchenko & Kovtunenکو, 2020). Another research by Yıldırım in 2022 emphasizes other essential criteria for MET such as professional development, personal growth, ethical standards and strict adherence to course hours (Yıldırım et al., 2022). Vujičić in 2020 stressed the need for instructors to satisfy these requirements so as to effectively enforce these standards (Vujičić et al., 2020). However, it's important to note that while the STCW Convention is a mandatory framework for maritime education and training (MET) institutions, some scholars, such as Pipchenko and Kovtunenکو (2020), have highlighted certain negative aspects of its implementation. Despite acknowledging its substantial positive impacts, particularly through the STCW 95 amendment, these scholars have pointed out areas of concern. Additionally, Zec, Komadina, and Pritchard (2002) have suggested the potential for future transitions towards more vocationally oriented systems within MET institutions. While adherence to the STCW Convention is compulsory for MET establishments training individuals for seafaring licenses, ongoing discussions among scholars highlight areas for improvement and potential alternative approaches.

2.4.2 Integration of intercultural communication and competence training at MET institutions

Research findings indicate that MET institutions vary in their integration of intercultural competence. Some incorporate modules on cultural awareness, communication strategies, and multicultural sensitivity (Taraban-Gordon & Page, 2011). However,

challenges arise in offering such courses, particularly in online formats, as noted by Taraban-Gordon and Page (2011). Ilie (2019) emphasizes the role of education in facilitating interactions between individuals from diverse cultural backgrounds. On the other hand, Ircha (2006) suggests that the lack of standardized training across cultures can lead to difficulties and hinder effective learning. Fantini (2007) explores and evaluates intercultural competence, focusing on the development of effective intercultural communication skills.

Ilie (2019) also states that technical skills have taken a precedence over soft skills such as intercultural competence in communicating effectively in a multicultural environment. Tashmatova (2021) gives importance to intercultural communication proficiency in language acquisition and development of critical thinking. Taraban-Gordon and Page (2011), addressing the workplace, advise on professional skills' courses within it as one way of enhancing its existence. According to Thapa (2019), therefore there is a need to include intercultural competency in teacher training programs for better interaction with diverse students.

Establishing such programs requires adequate resources and trained personnel; therefore, developing ICC training programs at higher education institutions necessitates dedicating resources towards this goal (Chang, 2017). Warren and Adler (1977) promoted an experiential learning model where students interact directly with different cultures in order to improve their intercultural competence. Ji (2020) asserts that embedding of intercultural communication competence within the undergraduate curriculum, accompanied by well-articulated learning outcomes and appropriate teaching strategies can yield significant benefits. Nonetheless, limited resources and expertise pose challenges for institutions integrating intercultural competences efficiently.

Integrating Intercultural Communication and Competence Management (ICCM) training into Maritime Education and Training (MET) institutions is still evolving and not yet standard practice across the sector. Some institutions have made notable advances in this area. For example, Jade University offers an elective ICCM course in their Bachelor's program for Nautical Science, which is designed to enhance students' intercultural skills. Similarly, the Maritime Academy Antwerp offers a module on General and Intercultural Communication in their Bachelor's program for Nautical Sciences, and a Master's course that includes soft skills training with a focus on ICCM principles (Antwerp, (n.d.)). These examples reflect the ideas of Progoulaki (2013), who argues for a multifaceted approach to developing cross-cultural competencies, and Vişan (2012), who highlights the importance of intercultural management skills for seafarers.

In contrast, other MET institutions still offer ICCM topics only as minor components within broader courses rather than as dedicated modules. For instance, HSB Bremen incorporates ICCM elements into general maritime subjects, and Abu Dhabi HCT Maritime

Academy provides ICCM content as supplementary material within existing courses. Cizer (2015) and Fan (2015) note that while innovative methods like blended learning, can enhance intercultural communication skills, the current approach in many institutions remains inconsistent. This uneven adoption underscores the need for a more standardized and comprehensive approach to integrating ICCM training across MET institutions, as highlighted by ongoing research and development efforts in this field (Progoulaki M. , 2013); (Cizer & Lungu, 2015)).

However, in maritime education, a lack of standardized guidelines for intercultural competence can lead to misunderstandings among people from different cultures (Ircha, 2006). There are contradictions in the current maritime education system, which may interfere with training targets as exposed by Emad and Roth (2008). Progoulaki (2013) suggests that cross-cultural competency should be integrated within the curriculum for maritime professionals demanding standard guidelines and accreditation requirements. Though there is increasing recognition of the importance of intercultural competencies, Leeman and Ledoux (2003) maintain that this has not been achieved in teacher education programs. Manuel (2017) also notes that academic shift has affected the maritime industry thus affecting curriculum development and desired learning objectives, especially when it comes to multicultural crews (Horck, 2006). The lack of awareness by stakeholders including academics and industry professionals of cultural awareness and communication skills further complicates things. This lack of knowledge can manifest in several ways, such as outdated curriculum content, a failure to recognize the importance of intercultural training, and limited opportunities for practical application of these skills (Heirs & Manuel, 2021). Gamil (2008) also contends that dissatisfaction among MET instructors themselves, possibly due to limited resources or professional development opportunities, contributes to these complexities.

In sum, the total challenges confronting MET demand the collective and orchestrated/coordinated efforts by institutions, stakeholders and regulatory bodies, as indicated by Aguas (2018). The main challenges consist in shortage of qualified marine officers and the integration of 21st-century skills and ability to cope with technological and environmental changes (Kim et al., 2023). This is vital given that global market scenarios should be considered while implementing revised STCW Convention (Baylon et al., 2011). The suggested frameworks by Edirisinghe Zhihong, and Lixin (2016) and Aguas (2018) offer important methods of dealing with these many-sided problems.

2.4.3 Assessing the success of communication and intercultural training for nautical officers

To effectively assess intercultural competence and communication management (ICCM) training for future management-level nautical officers, a multifaceted evaluation strategy should be employed. This approach should measure both the immediate impact of the

training and its long-term effectiveness in real-world maritime environments. Here are several suggested methods for this assessment, supported by key literature in the field.

2.4.3.1 Pre- and post-training assessment

Pre- and post-training evaluations are crucial for measuring the immediate outcomes of ICCM training. This approach involves:

- Knowledge tests: assess understanding of intercultural communication theories and management concepts (Rubinfeld, *Surveys: An Introduction*, 2004) . This can involve pre- and post-training tests to evaluate how much knowledge has been gained.
- Attitudinal surveys: measure changes in attitudes towards cultural diversity and intercultural interactions as well as self-efficacy in managing cultural diversity on board (Vişan I. , 2012). Surveys conducted before and after training can help gauge shifts in trainees' perceptions and openness to different cultures.
- Skill-based assessments: evaluate practical communication skills through simulated scenarios that reflect real-life situations on board (Kniazian, 2022). This method tests how trainees apply what they have learned in controlled settings.

For instance, pre- and post-training assessments could involve knowledge tests on intercultural competence, attitudinal surveys to gauge shifts in cultural perceptions, and skill-based assessments through simulations of shipboard scenarios.

2.4.3.2 Behavioural observations and simulations

Behavioural observations and role-playing exercises are effective for assessing how trainees manage intercultural conflicts and communication challenges:

- Simulated shipboard scenarios: create scenarios that mimic real-life shipboard challenges involving multicultural crews to observe how trainees handle these situations (Vişan I. , 2012).
- Role-playing exercises: use role-playing to simulate intercultural conflicts and assess trainees' responses and problem-solving abilities (Kniazian, 2022).

Behavioural observations through simulated shipboard scenarios and role-playing exercises can provide insights into trainees' practical application of ICCM skills.

2.4.3.3 Longitudinal studies

Longitudinal studies help track the long-term application of training concepts:

- Follow-up surveys: conduct surveys with graduates to assess the continued use of ICCM skills in their professional roles (Smirnov & Kondratiev, 2016).
- Performance reviews: collect feedback from supervisors on the effectiveness of trainees in multicultural settings (Progoulaki M. , 2013).
- Peer and subordinate feedback: obtain feedback from peers and subordinates to evaluate the practical application of ICCM skills (Ahmmed R. , 2018).

Longitudinal methods such as follow-up surveys and performance reviews can help track the ongoing effectiveness of ICCM training in real-world maritime environments.

2.4.3.4 Self-reflection and journals

Encouraging self-reflection and maintaining journals can capture personal growth and application of skills:

- Self-reflection essays: have trainees write essays reflecting on their experiences with intercultural situations (Čulić-Viskota A. , 2018).
- Journals: encourage regular entries on intercultural encounters and challenges (Noble A. , 2018).

Self-reflection essays and journals can offer personal insights into how trainees have applied their ICCM training in practice.

2.4.3.5 Qualitative feedback

Gather qualitative feedback through interviews and focus groups:

- Interviews: conduct in-depth interviews with trainees, instructors, and supervisors for detailed feedback (Noble A. , 2018).
- Focus groups: facilitate discussions among trainees to explore their experiences and challenges (Vişan I. , 2012).

Qualitative feedback through interviews and focus groups provides deeper insights into the effectiveness of the ICCM training program (Noble A. , 2018).

By integrating these methods, a comprehensive assessment of ICCM training effectiveness can be achieved. This approach balances quantitative measures, such as knowledge tests and surveys, with qualitative insights from interviews and self-reflections to capture both immediate and long-term outcomes of the training. A multifaceted evaluation strategy that includes pre- and post-training assessments, behavioural simulations, longitudinal studies, self-reflection, qualitative feedback, and industry partner evaluations offers a robust framework for assessing the effectiveness of ICCM training programs for future nautical officers.

2.5 Key concepts and definitions in intercultural communication and competence

To grasp the full scope of intercultural communication and competence (ICC), it is essential to consider and understand several fundamental concepts. These concepts form the basis for analysing and progressing in the field of ICC. By exploring these key ideas, the analysis and dissemination of research findings will be more coherent and meaningful. This section aims to define and discuss these foundational concepts, providing a clear framework for understanding the complexities of ICC in various contexts.

2.5.1 Intercultural competence

Intercultural competence and intercultural communication competence are related but distinct concepts. While they are often used interchangeably, it is important to recognize their specific differences. Intercultural competence refers to a broad set of skills, attitudes, and attributes necessary for effective interaction in diverse cultural settings. This includes qualities such as empathy, active listening, and a commitment to continuous learning and exploration of different cultural experiences (Witte & Harden, 2011). On the other hand, intercultural communication competence is a subset of intercultural competence focused specifically on effective communication practices across cultures. It involves the ability to manage and adapt communication strategies to bridge cultural gaps, challenge stereotypes, and craft respectful, culturally sensitive messages (Beamer, 1992). Thus, while intercultural communication competence is an integral part of intercultural competence, the latter encompasses a broader range of skills and attributes that support overall effective interaction in multicultural contexts.

Moreover, in conflict situations, intercultural competence necessitates the ability to assess and employ appropriate behaviours to manage conflicts constructively and achieve mutually beneficial resolutions (Ting-Toomey, 2007). This proficiency is particularly vital for undergraduate students, especially those from multicultural backgrounds, who emphasize the significance of cultivating understanding, cultural awareness, tolerance, and collaborative harmony (Odağ et al., 2015). In essence, intercultural competence equips individuals with the skills and mindset needed to navigate diverse cultural landscapes effectively, fostering meaningful connections, mutual respect, and successful communication across cultural boundaries.

2.5.2 Cultural challenges Vs. Communication barriers

Cultural challenges and communication barriers are related but distinct concepts that affect interactions in diverse environments. Understanding their differences is crucial for effectively addressing issues in multinational and multicultural settings.

Cultural challenges refer to broader issues stemming from differences in national, organizational, or societal cultures. These challenges include a lack of cultural competence, misunderstandings about cultural norms, and difficulties in adapting to new cultural contexts (Klein K. J., 2000). For example, a cultural challenge might involve navigating diverse value systems or overcoming biases related to different cultural practices and beliefs.

In contrast, communication barriers are specific obstacles that impede the exchange of information between individuals or groups. These barriers can result from language differences, misinterpretations of messages, or misunderstandings due to cultural differences (Fandrejewska & Wasilik, 2018). Communication barriers are the direct consequences of cultural challenges, manifesting issues in effectively sharing information and coordinating actions.

Cultural challenges such as varied approaches to hierarchy and decision-making can lead to communication barriers in international operations. For instance, a lack of understanding about differing cultural attitudes towards authority might result in miscommunications between team members from different cultural backgrounds (Klein K. J., 2000). Similarly, diverse cultural norms can create obstacles in communication, such as varying interpretations of feedback or differing expectations for formal versus informal interactions (Fandrejewska & Wasilik, 2018).

Therefore, while cultural challenges and communication barriers are interconnected, they are not synonymous. Cultural challenges encompass the broader difficulties arising from cultural differences, whereas communication barriers specifically refer to obstacles that hinder effective information exchange. Addressing these issues often requires different strategies: tackling cultural challenges involves fostering cultural competence and understanding, while overcoming communication barriers involves improving message clarity and ensuring effective information flow (Beamer, 1992).

2.5.1 Intercultural competence curricula

Intercultural competence in curricula refers to the integration of knowledge, skills, and attitudes necessary for effective communication and interaction across diverse cultural contexts within educational programs. It encompasses the ability to engage in open communication, demonstrate understanding, and exhibit tolerance towards individuals from different cultural backgrounds (Dorobantu-Dina, 2021). This concept emphasizes the importance of fostering multicultural awareness and sensitivity among students to prepare them for navigating today's globalized and diverse society.

Visram and Kanuga (2017) and Eden et al. (2024) emphasize the critical role of integrating intercultural competences into the curriculum. Visram highlights the benefits of

multicultural education pathways, while Eden discusses strategies for fostering inclusivity and diversity awareness. Eisenclas and Trevaskes (2007) explore practical approaches for incorporating intercultural competence into the curriculum, suggesting the utilization of international student populations and local migrant communities to facilitate meaningful interactions. These studies collectively underscore the significance of integrating intercultural competence into curricula to promote cultural understanding and enhance communication skills among students.

2.5.2 Intercultural awareness

Intercultural awareness, as defined by scholars such as Yong-che (2003) and Wang and Li (2007), is a foundational objective in intercultural communication. It encompasses principles of equality, reflection, mutual complement, and developmental awareness, fostering empathy and the ability to shift perspectives within communication contexts. This awareness is increasingly crucial amidst growing global cultural interactions and conflicts. In international business contexts, understanding diverse cultures is essential for addressing conflicts, understanding their origins, and developing effective business strategies (Di, 2009).

2.5.3 Intercultural communication

Intercultural communication is a complex and dynamic process involving the successful interaction between individuals from diverse cultural backgrounds (Mykhalchuk & Ivashkevych, 2020). It entails negotiating cultural meanings and adapting communication to align with the audience's cultural context (Szalay, 1981). For business professionals, mastering intercultural communication demands not just proficiency in language but also sensitivity and awareness of cultural nuances (Mykhalchuk & Ivashkevych, 2020).

2.6 Strategies for enhancing intercultural competence and mitigating conflicts on seagoing vessels

There is a variety of methods that have been identified to promote seafarers' intercultural competence and at the same time prevent cross-cultural conflicts. Crew cohesion and communication can be enhanced by cultural management as pointed out by Theotokas and Progoulaki (2007). Wang and Gu (2005) state that maritime communication should take into consideration linguistic capabilities and cultural differences. Additionally, Progoulaki and Theotokas (2016); Progoulaki and Roe (2011) emphasize human resource management along with cultural diversity management in shipping organizations, the latter accentuating the significance of socially responsible behaviour. These are some strategies which make it possible for these seafarers from different cultural backgrounds to work together more harmoniously and efficiently.

Moreover, Ilie (2019); Helt and Seelye (1987) both stress the importance of fostering intercultural communication skills and cultural awareness as well as suggesting practical strategies for teaching about culture. Li (2011); Canfield, Low and Hovestadt (2009) concentrate on training techniques, with Li focusing on the benefits of network teaching environments and fieldwork instruction whereas Canfield et al. (2009) examine cultural immersion experiences. These investigations evidently reveal the significance of intercultural training courses for seafaring crew members in terms of increasing their intercultural competence and facilitating effective communication.

Primarily, it has been proven that initiatives towards cultural sensitivity play a major role in reducing conflicts among crew members within vessels sailing in international waters (Romelczyk & Becker, 2016). Such approaches include cultural immersion experiences, diversity workshops, as well as cross-cultural dialogue sessions available to crews which enable them to gain deeper insight into diverse cultural perspectives. However, one should note that subjective risk perception may not always align with formal risk levels since these could be impacted by cultural factors (Bye & Lamvik, 2007). Hence, promotion of cultural sensitivity must take into account the effects of cultural factors on perceived risks.

That is why it is important to have effective intercultural communication that will help in developing intercultural competence and minimizing misunderstandings in various settings including ships (Muhammad, 2005).

Consequently, conflict resolution protocols and strategies must be implemented to manage cross-cultural conflicts on board sea-going vessels (Rahim, 1989). These protocols should have distinct guidelines for handling disputes, training in conflict negotiation techniques as well as establishing open channels of communication which are based on

mutual respect (Gheorghe, 2019). However, it must be noted that these protocols may not always result in resolving conflicts such as the South China Sea dispute (Scott, 2012). Additionally, it's worth noting that while a common language like English can facilitate communication, cultural differences can still influence the effectiveness of communication protocols. This is evident in studies such as those examining preferred styles of conflict handling among international joint venture managers (Wang & Gu, 2005).

Lastly, it is important for effective leadership in culturally diverse workplaces to be fostered for intercultural competence and conflict management (Williamson, 2007). This requires leaders to have cultural intelligence, which is about putting judgment aside, attending to the situation at hand and aligning individual and organizational attributes (Triandis, 2006). Finally, fostering an environment of mutual respect, understanding and collaboration that supports growth of intercultural competence requires developing organizational culture by leaders (Barnes & Seemiller, 2023).

2.7 Summary

To summarize (see Figure 9), the research on intercultural communication and competence in MET institutions emphasizes the importance of understanding both culture and communication as well as their complicated relationship. For effective training programs on intercultural communication to be developed and delivered, there is a need to comprehend the dynamics and challenges that come with cultural diversity. It is necessary to identify barriers, attributes and complexities inherent in these fields for an inclusive understanding among various stakeholders.

Figure 9: Intercultural Communication and Competence in MET Institutions (Source: Own Work)



Additionally, it's worth noting that while a common language like English can facilitate communication, cultural differences can still influence the effectiveness of communication protocols. This is evident in studies such as those examining preferred styles of conflict handling among international joint venture managers (Wang & Gu, 2005).

However, various scholars have proposed perspectives on integrating intercultural communication and competence into maritime institutions. Despite this, standardized norms have been increasingly overlooked, leading to an educational approach that adapts to evolving global environments.

Furthermore, teachers and students benefit from the insights that emerge from different sources which go on to provide novel approaches as far as facilitation of intercultural communication and competence is concerned. It is possible for educators to create a learning atmosphere which supports every learner regardless of their cultural differences by employing these strategies that foster cross-cultural understanding, and provide learners with the skills and knowledge required in order to operate successfully in complex situations where they may not be familiar with all the cultural intricacies.

One major issue as we think about intercultural communication and competence within MET institutions pertains to cultivating pedagogic practices which are more oriented towards continuous engagement, collaboration, scholarly inquiry, empathy, respect and intercultural competency. With this investigation's findings and recommendations as a foundation, educators and other stakeholders can strive for a teaching environment that is even more inclusive while remaining sensitive to culture so as to enable learners to succeed in an interconnected world where global diversity characterizes everything.

Chapter 3 Quantitative Data Analysis: Methods and Results

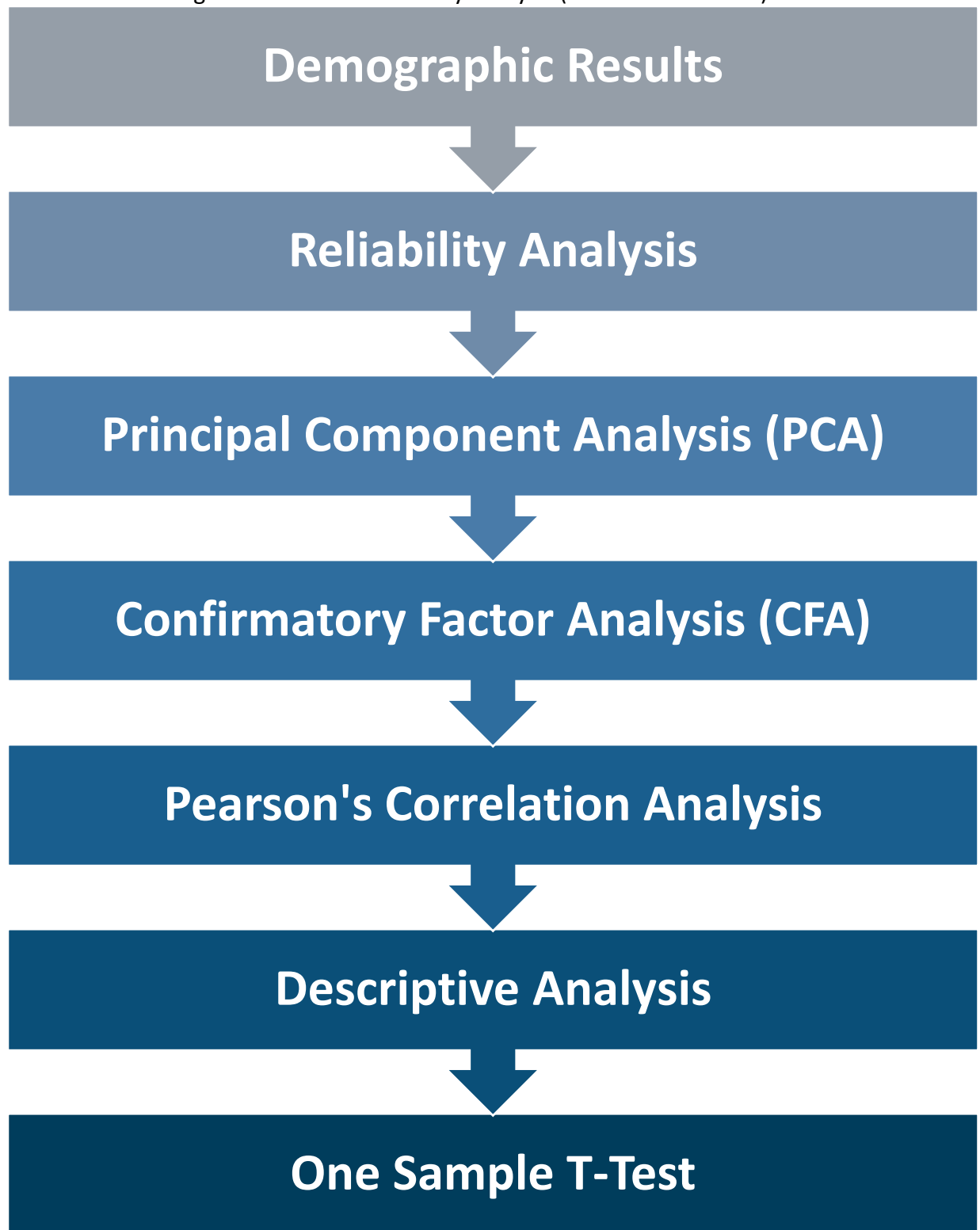
For the quantitative method, a survey approach was adopted, adhering to high standards as advocated by Fincham and Draugalis (2013), who emphasize the importance of investing both dynamism and consistency into quality and standardization. In my research survey, dynamism is reflected in the flexibility and adaptability of the research approach. This means that the survey method was designed to accommodate various factors and changes during data collection to ensure that the results remained relevant and accurate. This perspective is supported by Roopa and Rani (2012), who underscore the critical role of proper questionnaire design. Additionally, French (2012) delves into the fundamentals of survey technology and practical means for its formation, while Rubenfeld (2004) explores methods to ensure accurate and unbiased data through surveys. These scholars collectively highlight various aspects of thoughtful questionnaire construction and underscore considerations for respondent demographics and cognitive characteristics.

In designing the survey, axes and dimensions were employed to enhance usability and minimize researcher biases, drawing upon methods outlined by Weng and Young (2017) and Blackburn (1982). These methodologies prove especially beneficial for transforming variables and analysing survey data, as emphasized by Weng and Young (2017). Furthermore, they facilitate exploratory analysis by visualizing dimension coverage, assisting analysts in recalling the aspects considered and those yet to be explored, as highlighted by Sarvghad, Tory and Mahyar (2017).

This research focuses on exploring various axes and dimensions. Which are associated with curriculum implementation, cultural challenges and effective strategies for crew on board seagoing vessels as per my main goal. For my central research question (CRQ) on (How can the performance of management-level crew be elevated through the enrichment of the educational curriculum at Maritime Education and Training (MET) institutions?), I have developed an ordered plan consisting of three axes, each dealing with different aspects of the study.

Through exploration of these dimensions through a mixed methods approach, I would aspire to provide useful information for improving MET institutions' curricula to raise the performance levels of management level seafarers and contribute towards a maritime workforce that is more culturally aware and efficient in terms of communication.

Figure 10: Process of Survey Analysis (Source: Own Work)



3.1 Method

3.1.1 Key considerations in survey design

The importance of a systematic survey structure in research is emphasized by Gmel et al. (2000) and Saris and Gallhofer (2014). They highlighted that a key aspect of a survey is having clear and well-designed questions. The article by Gmel et al. (2000) delves into the implications of survey design, while Saris and Gallhofer's book (2014) provides a comprehensive overview of questionnaire design principles. According to Giuffre (1997), the critical engagement with survey research is a significant element in addition to the structured approach. Moreover, Liu (2019) illustrates mainly the practicality of the structured survey with descriptive statistics as a means to present participants' profile and the study variables.

For this research, five-point Likert scales (see Table 3), ranging from "Strongly Agree" to "Strongly Disagree," were employed to measure attitudes and perceptions. These scales are particularly effective for capturing a range of opinions and is straightforward for respondents to understand and use (Emerson, 2017). The simplicity of the 1-5 scale facilitates clear numerical coding of responses, which directly aligns with the research objectives of assessing attitudes and perceptions (Emerson, 2017).

Additionally, a five-point Likert scale strikes a balance between granularity and usability, offering a manageable range of options for respondents while still providing sufficient detail for analysis. It effectively measures the intensity of attitudes and perceptions without overwhelming the respondent with too many choices, which can be beneficial for ensuring clarity and consistency in survey responses (Cohen et al., 2017).

Table 3: Likert Scale (Source: Own Work)

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	2	3	4	5

As for Demographic factors, such as sex, age, time at sea, and prior ICC training have a significant effect on intercultural competence research (Haskollar & Kohli Bagwe, 2022). Establishing the impact of these variables upon intercultural competence as given by Haskollar and Kohli Bagwe (2022) supports the significance of demographic variables like

gender, age, time served at sea or previous intercultural communication competence (ICC) training in research. The demographic factors examined in this research, including sex, age, time at sea, and prior ICC training, serve as crucial components for exploration.

Three axes can be used to organize survey dimensions according to Stoop and Harrison (2012) and Lehmann et al. (2008). Stoop and Harrison's (2012) categorization of surveys provides a framework that contributes to the organization of survey dimensions into three axes. Consequently Lehmann's (2008) categorization of surveys is useful in that it helps in dividing survey dimensions into four axes.

These axes are made up of various dimensions entailing issues related to intercultural competency; teaching of communication; seafarer challenges faced on board; and challenges experienced at MET institutions.

3.1.2 Survey structure and content

The final version of the survey was meticulously designed to gather comprehensive data relevant to the study's objectives. This survey structure ensures a systematic approach to data collection, facilitating clear and meaningful analysis. It is divided into two main parts, each targeting specific aspects of the research focus. This division allows for an organized and focused examination of both demographic factors and specific research areas, ensuring that the collected data is both relevant and detailed. The two parts are:

Part 1:

This section consists of essential demographic information pertaining to the study sample, such as age, sex, experience on board, number of ICC training courses undertaken.

Part 2:

- **Axis 1: Teaching Intercultural Competence**
 - Dimension 1: Intercultural Training
 - Q1: Emphasizes the importance of intercultural training in improving seafarers' intercultural competence.
 - Q2: Highlights how intercultural training can aid in adapting to multicultural work environments.
 - Q3: Stresses the role of intercultural training in providing realistic expectations about life on board.
 - Q4: Indicates how intercultural training helps alleviate stress and ambiguity experienced by seafarers on board.
 - Dimension 2: Intercultural Awareness
 - Q5: Underlines the necessity of intercultural awareness for effective interactions across different cultures.
 - Q6: Highlights the importance of cultivating sensitivity to manage cultural differences in a global workplace.
 - Q7: Stresses the need for students to recognize the importance of coexistence with diverse cultures for intercultural interaction.
 - Q8: Emphasizes the essential role of intercultural awareness training programs in enhancing future seafarers' interpersonal skills.

- Dimension 3: Intercultural Curricula
 - Q9: Advocates for MET institutions to prioritize preparing interculturally competent professionals through tailored curricula.
 - Q10: Suggests that intercultural curricula should encompass learning and understanding cultural awareness.
 - Q11: Calls for enhancing language competencies within intercultural curricula.
 - Q12: Indicates the necessity for curricula to focus on increasing intercultural understanding and acceptance.
- **Axis 2: Teaching Communication Competences**
 - Dimension 1: Communication Programs
 - Q13: Stresses that communication programs should facilitate recognizing commonalities and differences among cultures.
 - Q14: Highlights the importance of improving crew communication to mitigate the risk of cultural shock.
 - Q15: Emphasizes the role of leadership in enhancing intercultural competency within multicultural teams.
 - Q16: Indicates how intercultural communication enables understanding of values and beliefs beyond behaviours.
 - Dimension 2: Intercultural Communication
 - Q17: Underlines how intercultural dialogue fosters a peaceful and sustainable environment on board.
 - Q18: Indicates how intercultural dialogue enhances the interpersonal and communication skills of graduate students.
 - Q19: Emphasizes the necessity of providing professional training to enhance seafarers' intercultural communication skills.
 - Q20: Highlights the importance of addressing intercultural dialogue to enhance motivation for intercultural experiences.
 - Dimension 3: Intercultural Language Use
 - Q21: Stresses the importance of intercultural understanding in developing curiosity and openness to otherness.
 - Q22: Highlights the need for teaching methods to enhance the efficient use of verbal and non-verbal communication.
 - Q23: Advocates for enhancing intercultural language competence to improve linguistic proficiency.

- Q24: Indicates that proficiency in foreign languages is essential for effective intercultural communication.
- **Axis 3: Challenges Faced by Seafarers on Board**
 - Dimension 1: Cultural Challenges
 - Q25: Addresses the possibility of culture clashes within multicultural teams on board.
 - Q26: Points out the inadequacy of teaching materials in universities to fulfil intercultural competence requirements.
 - Q27: Highlights how limited cultural comprehension can lead to feelings of disconnectedness, remoteness, and frustration.
 - Q28: Indicates the challenges seafarers may face in interpreting verbal or nonverbal expressions of other cultures.
 - Dimension 2: Communication challenges
 - Q29: Addresses how a lack of language competency can lead to misunderstandings among crewmembers.
 - Q30: Highlights how the inability to speak a common language can create misunderstandings between vessels.
 - Q31: Indicates the scarcity of individuals proficient in another language at an acceptable level.
 - Q32: Points out the lack of training in understanding gestures and eye contact.
 - Dimension 3: Teaching/Learning Challenges
 - Q33: Suggests that training content superficially addresses multicultural topics.
 - Q34: Indicates that maritime graduates may lack proficiency in communication skills.
 - Q35: Highlights the absence of courses on communication and intercultural competence in maritime institutions.
 - Q36: Points out the absence of a recognized method to assess the success of cultural awareness courses.

3.1.3 Research questions and survey alignment

Research questions correspond to specific axes and dimensions in the survey instrument. For example, Axis 1 deals with intercultural competence teaching through questions such as “Intercultural Training.” Communication capability appears under Axis 2 in questions such as “Communication Training.” A structured approach to effectively address these research queries can be seen in Table 4, where each question relates to its axis and dimension.

Table 4: Alignment between RQ and Survey Axis and Dimensions (Source: Own Work)

Research Question	Axis & Dimension Survey
The first axis: teaching intercultural competence	
To what extent are courses of intercultural competence integrated into the educational curricula at Maritime Education and Training (MET) institutions?	The first dimension: intercultural training
	The second dimension: intercultural awareness
	The third dimension: intercultural curricula
The second axis: teaching communication competences	
To what extent is the teaching of communication skills emphasized within the academic framework of Maritime Education and Training (MET) institutions?	The first dimension: communication programs
	The second dimension: intercultural communication
	The third dimension: intercultural language use
The third axis: challenges faced by seafarers on board	
What are the predominant cultural hurdles and communication barriers faced by seafarers aboard seagoing vessels?	The first dimension: cultural challenges
	The second dimension: communication challenges
What challenges do educators and students encounter in teaching and learning intercultural communication and competence at Maritime Education and Training institutions?	The third dimension: teaching/ learning challenges

3.2 Results

Quantitative data analysis involves the examination of numerical data to identify patterns, relationships, and trends. In this study, several analytical techniques were employed to analyse quantitative data:

1. **Demographic Results:** the demographic characteristics of the sample were analysed to provide insights into the distribution and composition of the study population, establishing a foundational understanding of the survey respondents' profiles.
2. **Reliability Testing:** internal consistency and reliability were determined by means of Cronbach's alpha coefficient and item analysis in order to check the measurement scales employed in this research. This scientific technique guaranteed the confidence and stability of the quantitative measures used.
3. **Principal Component Analysis (PCA):** PCA was used to investigate the latent structure among the quantitative variables and reveal any underlying patterns or factors that may have contributed to their formation. In this way, data dimensionality was reduced while maximum original variance was retained.
4. **Confirmatory Factor Analysis (CFA):** the factor structure of these measurement scales that were applied in this study had been validated using CFA. Through testing whether observed data agrees with hypothesized measuring model, CFA enabled us to understand more about construct validity in relation to those instruments.
5. **Pearson Correlation Analysis:** similarities between diverse quantities were established by applying Pearson correlation analysis on such values, enabling the exportation of potential connections and correlation.
6. **Descriptive Statistics:** this section sums up and describes the dataset's basic. For a complete overview of the quantitative variables under study, it was necessary to calculate mean values, standard deviations, frequencies and percentages.
7. **One-Sample t-Test Analysis:** The significance of a single sample mean was evaluated through a one-sample t-test analysis, providing insights into the deviation from the population mean and establishing the statistical relevance of the observed sample mean.

3.2.1 Demographic results and sampling

The target group for this survey comprised seafarer officers at the management level, focusing on individuals who hold leadership positions on board commercial vessels. This group was selected to gather insights from those with direct experience in managing intercultural interactions and communication at sea (BIMCO & ICS, 2023).

The survey was distributed using a random sampling method through Google Forms. The link was shared via a maritime forum on social media, allowing for anonymous participation without restrictions related to vessel types or shipping companies. This approach aimed to include a diverse range of seafarer officers to capture a broad spectrum of experiences related to intercultural competence and communication management.

The survey collected responses from 94 seafarer officers (see Table 5), consisting of 83 males and 11 females. This gender distribution reflects the predominance of males in the maritime industry, as reported in the BIMCO & ICS Seafarer Workforce Report (2023).

In terms of age, the survey respondents were predominantly under 30 years old, with the following distribution:

- Under 30 years: 78 respondents
- 30-40 years: 6 respondents
- 40-50 years: 5 respondents
- Over 50 years: 5 respondents

This age distribution aligns with the trends observed in the maritime industry, where younger seafarers are more prevalent (European Commission, 2020). The results from the survey's age demographic further reflect broader industry patterns (Petridou et al., 2023).

The survey used a combination of convenience and purposive sampling methods, distributed through a maritime forum to reach a diverse group of seafarer officers. This methodology aimed to provide an adequate snapshot of the seafaring community's experiences and perspectives on intercultural competence and communication management (Petridou et al., 2023), in a sample that reflects the actual study population of international seafarer officers at the management level.

Table 5: Demographics Results of the Survey (Source: Own Work)

Gender		Age (years)		Experience on board (years)		Training in ICCM (courses)	
Male	83	<30	78	<5	50	< 3	51
Female	11	30-40	6	5-10	30	3- 5	9
		40-50	5	>10	14	> 5	9
		> 50	5			None	25

The gender, age, years of service at sea and any previous training courses on intercultural communication and competence were the demographic variables gathered in the survey. For gender, male or female was selectable by the respondents. The age categories ranged from less than under 30 to over 50 years. Years of service at sea were divided into three segments: less than 5 years, 5 to less than ten years and 10 years and above. Other alternatives for previous training courses on intercultural communication and competence included Less than three courses; Three to five courses; More than five; or None.

Overall, the demographic profile of the survey sample aligns with current industry trends and workforce statistics of the seafaring officer population ((BIMCO & ICS, 2023); (European Commission, 2020)).

3.2.2 Reliability testing for dimensions

Cronbach (1947) and Adams (2005) underscore the foundational importance of test reliability in research, with Cronbach emphasizing various types of reliability and Adams introducing the concept of a measurement design effect. In the context of our study, employing Cronbach's alpha and single-item analysis is crucial. Cronbach's alpha allows us to assess the internal consistency of our survey items, ensuring that they measure the same underlying construct reliably. Additionally, single-item analysis enables a granular examination of each survey question's reliability, revealing insights into the robustness of individual measures within our research framework. By leveraging these methods, we can confidently uphold rigorous standards of reliability, validating the consistency and accuracy of our survey findings. The reliability test results, shown in Reliability Results in Annex II Survey results, making clear suggestions as follows:

AXIS 1 DIMENSION 1 Intercultural training

The results suggest that dimension A1D1 (Intercultural training) has high internal consistency reliability, with each item contributing positively to the reliability of the scale. This indicates that the items within this dimension are effectively measuring the same underlying construct of intercultural training.

AXIS 1 DIMENSION 2 Intercultural awareness

The test results suggest that dimension A1D2 (Intercultural awareness) has acceptable internal consistency reliability, with each item contributing positively to the reliability of the scale. However, the reliability could be improved, particularly by addressing the lower inter-item correlation.

AXIS 1 DIMENSION 3 Intercultural curricula

The test results suggest that dimension A1D3 (Intercultural curricula) has moderate internal consistency reliability. However, the average inter-item correlation is relatively low, indicating that the items may not be measuring the same underlying construct very well. Item A1D3Q11 seems to contribute the most to the internal consistency of the scale, while item A1D3Q9 has the lowest item-rest correlation. Further refinement of the items may improve the reliability of this dimension.

AXIS 2 DIMENSION 1 Communication programs

The test results suggest that dimension A2D1 (Communication programs) has moderate internal consistency reliability. The average inter-item correlation indicates a reasonable level of correlation between the items. However, item A2D1Q13 appears to contribute

the least to the internal consistency of the scale, while item A2D1Q16 contributes the most. Further investigation into item A2D1Q13 may be warranted to improve the reliability of this dimension.

AXIS 2 DIMENSION 2 Intercultural communication

The test results suggest that dimension A2D2 (Inter-cultural Communication) has moderate to good internal consistency reliability. The average inter-item correlation indicates a reasonable level of correlation between the items. Item A2D2Q18 appears to contribute the most to the internal consistency of the dimension, while further investigation may be needed for item A2D2Q17, which shows a relatively low item-rest correlation.

AXIS 2 DIMENSION 3 Intercultural language use

The test results suggest that dimension A2D3 (Intercultural language use) has good internal consistency reliability. The average inter-item correlation indicates a reasonable level of correlation between the items. Item A2D3Q24 appears to contribute the most to the internal consistency of the dimension.

AXIS 3 DIMENSION 1 Cultural challenges

The test results suggest that dimension A3D1 (Cultural challenges) has good internal consistency reliability. The average inter-item correlation indicates a reasonable level of correlation between the items, and all items contribute to the internal consistency of the dimension.

AXIS 3 DIMENSION 2 Communication challenges

The test results suggest that dimension A3D2 (Communication challenges) has good internal consistency reliability. The average inter-item correlation indicates a reasonable level of correlation between the items, and all items contribute to the internal consistency of the dimension.

AXIS 3 DIMENSION 3 Teaching/Learning challenges

The test results suggest that dimension A3D3 (Teaching/learning challenges) has excellent internal consistency reliability. The average inter-item correlation indicates a good level of correlation between the items, and all items contribute significantly to the internal consistency of the dimension.

Evaluation of reliability testing:

Overall, these findings provide evidence that the dimensions in the survey exhibit sufficient internal consistency reliability for their intended use. While some dimensions may benefit from minor adjustments to improve reliability further, they generally represent robust measures of their respective constructs. Therefore, these dimensions can confidently be used in statistical surveys to assess and analyse intercultural and communication-related phenomena.

3.2.3 Validity testing

Confirmatory Factor Analysis (CFA) is widely recognized as a robust method for evaluating the validity and reliability of measurement instruments across various disciplines, including education (Said et al., 2011) and assessments of teacher stress (Schutz & Long, 1988). It has also been instrumental in validating dimensional factor structures, such as the personality psychopathology five, across clinical and nonclinical samples (Bagby et al., 2002). However, concerns have been raised regarding the applicability of linear variable selection techniques like Principal Component Analysis (PCA) and Pearson Correlation Coefficient (PCC) in non-linear modelling contexts, such as artificial neural networks (Jayaweera & Aziz, 2018).

To provide a comprehensive assessment of validity testing processes and outcomes, this study employed Principal Component Analysis (PCA), Confirmatory Factor Analysis (CFA), and Pearson correlations. Detailed findings and interpretations of these analyses are presented in Annex II Survey results of the thesis, ensuring that readers have access to supplementary information while maintaining clarity and coherence in the main text. This approach enhances transparency and rigor in reporting validity testing procedures, thereby bolstering the overall credibility and trustworthiness of the research findings.

3.2.3.1 *Principal component analysis (PCA)/ Construct Validity*

The Principal Component Analysis (PCA) results, as shown in Annex II Survey results under Principal component analysis (PCA)/ Construct Validity for each dimension have been summarized as follows:

Axis 1 Dimension 1 (A1D1) - Teaching intercultural competence

The PCA results for teaching intercultural competence on Axis 1, Dimension 1 (A1D1), reveal good construct validity. All items show high loadings on the first principal component, indicating effective measurement of intercultural training.

Axis 1 Dimension 2 (A1D2) - Intercultural awareness

For Axis 1, Dimension 2 (A1D2), pertaining to intercultural awareness, the PCA results also demonstrate good construct validity, with all items showing high loadings on the first principal component.

Axis 1 Dimension 3 (A1D3) - Intercultural curricula

While some items in Axis 1, Dimension 3 (A1D3) related to intercultural curricula demonstrate stronger associations with the underlying construct, the overall suitability of the data for factor analysis may need improvement.

Axis 2 Dimension 1 (A2D1) - Teaching communication competences

The PCA results for teaching communication competences on Axis 2, Dimension 1 (A2D1) suggest moderate suitability for factor analysis, with some items demonstrating stronger associations with the underlying construct.

Axis 2 Dimension 2 (A2D2) - Intercultural communication

For Axis 2, Dimension 2 (A2D2) concerning intercultural communication, the PCA results indicate good construct validity, with most items showing strong associations with the underlying construct.

Axis 2 Dimension 3 (A2D3) - Intercultural language use

In Axis 2, Dimension 3 (A2D3), related to intercultural language use, all items demonstrate strong associations with the underlying construct, indicating good construct validity.

Axis 3 Dimension 1 (A3D1) - Challenges faced by seafarers (Cultural)

For Axis 3, Dimension 1 (A3D1), which focuses on cultural challenges faced by seafarers, the PCA results show strong associations with the underlying construct, indicating good construct validity.

Axis 3 Dimension 2 (A3D2) - Challenges faced by seafarers (Language)

In Axis 3, Dimension 2 (A3D2), pertaining to communication challenges faced by seafarers, the PCA results also demonstrate strong associations with the underlying construct, indicating good construct validity.

Axis 3 Dimension 3 (A3D3) - Challenges faced by seafarers (Teaching/Learning)

For Axis 3, Dimension 3 (A3D3), which addresses teaching and learning challenges faced by seafarers, the PCA results exhibit strong associations with the underlying construct, indicating good construct validity.

Detailed tables and explanations of the PCA results will be provided in Annex I for further reference and clarity.

3.2.3.2 Component identification

The survey items were analysed using Principal Component Analysis (PCA) to identify key components for each dimension. Here's a summary of results, as shown in Component identification under Annex II Survey results, the components identified:

First Axis - Teaching intercultural competence

- Component 1 (Intercultural Training and Awareness): emphasizes the importance of cross-cultural training and awareness, stressing realistic expectations and sensitivity to cultural differences.
- Component 2 (Intercultural Curricula): highlights the role of intercultural curricula in preparing professionals with language competencies and cross-cultural understanding.

Second Axis - Teaching communication competences

- Component 1 (Communication Programs): stresses the significance of communication programs in improving crew communication and leadership's cross-cultural competency.
- Component 2 (Intercultural Communication): focuses on the role of intercultural dialogue and professional training in enhancing interpersonal and communication skills.

Third Axis - Challenges faced by seafarers on board

- Component 1 (Cultural Challenges): addresses culture clashes and limited cultural comprehension among multicultural teams on board.
- Component 2 (Communication challenges): focuses on language-related challenges leading to misunderstandings among crew members and difficulties in communication.

- Component 3 (Teaching/Learning Challenges): highlights challenges related to teaching and learning intercultural competence, including inadequate communication skills among maritime graduates.

These components offer valuable insights for educational institutions, training programs, and policymakers. Detailed analysis and tables will be provided in Annex xxx for further reference and clarity.

3.2.3.3 Confirmatory Factor Analysis (CFA)

The results of Confirmatory Factor Analysis (CFA) for each axis provide valuable insights into the validity and reliability of the measurement models. Here's a summary of the findings:

A1 (C1 & C2) - Teaching intercultural competence

- The CFA results support the validity of the specified model, with a significantly better fit compared to the baseline model ($p < 0.05$).
- Factor loadings indicate strong relationships between observed variables and latent factors, supporting the validity of the measurement model.
- Variances of latent factors are appropriately scaled.
- Significant factor covariances suggest meaningful relationships between pairs of latent factors.
- Residual variances highlight unique variance not explained by the latent factors.

A2 (C1 & C2) - Teaching communication competences

- The specified model demonstrates a significantly better fit than the baseline model ($p < 0.001$), supporting its validity.
- Factor loadings indicate strong associations between observed variables and latent factors, confirming the measurement model's validity.
- Variances of latent factors are appropriately scaled, explaining all variance in their respective indicators.
- Significant covariance between Factor 1 (Communication Programs) and Factor 2 (Intercultural Communication) suggests a moderate positive relationship.

A3 (C1, C2 & C3) - Challenges faced by seafarers on board

- The factor model shows a significantly better fit than the baseline model ($p < 0.001$), indicating its validity.
- Strong factor loadings indicate robust relationships between observed variables and latent constructs.
- Latent factors explain all variance in their respective indicators.
- Significant factor covariances suggest relationships between pairs of factors.
- Residual variances highlight unique variance in observed variables not accounted for by the factors.

These results suggest that the specified CFA models effectively capture the underlying structures of the constructs related to teaching intercultural competence, communication competences, and challenges faced by seafarers on board. Detailed tables and explanations will be provided in Annex 1 for further reference and clarity.

3.2.3.4 Pearson's correlations for single statements

The Pearson's correlations analysis provides valuable insights into the respondents' perspectives on various statement within dimensions. Detailed Results can be found in Pearson's Correlations in Annex II Survey results. Here's a summary of the findings:

- **Intercultural Training (AXIS 1 DIMENSION 1):** Strong positive correlations among statements indicate consistent agreement on the importance and effectiveness of cross-cultural training in various aspects of intercultural competence.
- **Intercultural Awareness (Axis 1 DIMENSION 2):** Significant positive correlations among statements highlight the importance of intercultural awareness in cross-cultural interactions and interpersonal skills development.
- **Intercultural Curricula (AXIS 1 DIMENSION 3):** Varied correlations suggest differing perspectives on aspects of intercultural curricula, particularly regarding cultural awareness integration and language competencies.
- **Communication Programs (AXIS 2 DIMENSION 1):** Consistent positive correlations emphasize the significance of communication programs in fostering cross-cultural understanding and enhancing crew communication.
- **Intercultural Communication (AXIS 2 DIMENSION 2):** Strong positive correlations highlight the positive impact of intercultural dialogue and professional training on enhancing intercultural communication skills.
- **Intercultural Language Use (AXIS 2 DIMENSION 3):** Positive correlations underscore the interconnectedness of intercultural understanding, language proficiency, and effective communication strategies.

- **Cultural Challenges (AXIS 3 DIMENSION 1):** Strong positive correlations reveal consistent perceptions regarding challenges related to cultural diversity and intercultural communication on board.
- **Communication challenges (AXIS 3 DIMENSION 2):** Significant correlations highlight the impact of limited language proficiency on communication effectiveness within and between maritime crews.
- **Teaching/Learning Challenges (AXIS 3 DIMENSION 3):** Strong positive correlations indicate perceived challenges in education and training within maritime institutions, particularly regarding curriculum adequacy and assessment methods.

These results offer a comprehensive understanding of respondents' perspectives on various dimensions related to intercultural competence, communication competences, and challenges faced by seafarers on board. For detailed correlations and insights, please refer to Annex II Survey results.

Evaluation of validity testing components

The validity testing process conducted for this study involved a rigorous examination through Principal Component Analysis (PCA), Confirmatory Factor Analysis (CFA), and Pearson correlations, aimed at ensuring the credibility and trustworthiness of the research findings.

Principal Component Analysis (PCA) results for each dimension indicate good construct validity across the majority of axes and dimensions. Specifically, the PCA demonstrates strong associations between survey items and the underlying constructs, highlighting the effectiveness of measurement in assessing intercultural competence, communication competences, and challenges faced by seafarers on board.

Confirmatory Factor Analysis (CFA) further validates the measurement model, indicating significant improvements in model fit compared to baseline models. Factor loadings and factor covariances demonstrate robust relationships between observed variables and latent constructs, supporting the validity of the measurement models.

Pearson correlation analyses provide further insights into respondents' perspectives on various dimensions, highlighting consistent agreement on the importance of intercultural training, awareness, communication programs, and challenges faced by seafarers on board.

Overall, the comprehensive validity testing process ensures the robustness and reliability of the research findings, contributing to a deeper understanding of intercultural competence, communication competences, and challenges within maritime education

and training contexts. For detailed correlations and insights, readers are encouraged to refer to Annex I.

3.2.1 Descriptive statistics

To ensure clarity and facilitate analysis, each dimension was computed into a separate dataset, with new variables constructed to represent the aggregated scores of the items within each dimension. This approach allows each dimension to be treated as a single variable, providing a clear and logical framework for descriptive statistics and subsequent analyses, such as one-sample t-tests. By consolidating items into single variables per dimension, we establish a solid foundation for analysing results and extracting actionable insights for discussion. This structured method not only enhances clarity in presenting the findings but also streamlines the interpretation of reliability assessments conducted for each item within every dimension and axis.

These new variables as shown in Table 6 allow for precise measurement and analysis of each dimension's specific aspects.

Table 6 : Variables Mapping to Dimension Names (Source: Own Work)

Code	Variable Name
A1D1	Intercultural training
A1D2	Intercultural awareness
A1D3	Intercultural curricula
A2D1	Communication programs
A2D2	Intercultural Communication
A2D3	Intercultural language use
A3D1	Cultural challenges
A3D2	Communication challenges
A3D3	Teaching/learning challenges

Table 7 : Descriptive Statistics of Variables (Source: Own Work)

Descriptive	A1D1	A1D2	A1D3	A2D1	A2D2	A2D3	A3D1	A3D2	A3D3
Valid	94	94	94	94	94	94	94	94	94
Missing	6	6	6	6	6	6	6	6	6
Mean	2.548	2.527	2.46	2.497	2.492	2.455	3.598	3.582	3.726
95% CI Mean Upper	2.781	2.736	2.667	2.715	2.714	2.685	3.83	3.801	3.96
95% CI Mean Lower	2.315	2.317	2.253	2.279	2.27	2.224	3.367	3.364	3.492
Std. Deviation	1.137	1.024	1.009	1.064	1.082	1.125	1.128	1.067	1.141
Minimum	1	1	1	1	1	1	1	1	1.25
Maximum	5	4.75	4.5	4.5	4.75	4.75	5	5	5

3.2.1.1 A1D1 Intercultural training

The mean score of 2.548 for A1D1 suggests that respondents, on average, rated intercultural training slightly above the midpoint (which would be 3 on a Likert scale). This indicates a generally positive attitude towards the importance of intercultural training in the context studied.

The standard deviation of approximately 1.137 implies that responses are somewhat dispersed around the mean score of 2.548, but not excessively so. This suggests moderate variability in perceptions among respondents regarding intercultural training.

Overall, these descriptive statistics provide insights into how respondents perceive intercultural training, highlighting both the average sentiment and the range of opinions within the sample.

3.2.1.2 A1D2 Intercultural awareness

The mean score of 2.527 for A1D2 indicates that respondents, on average, rated intercultural awareness slightly above the midpoint. This suggests a generally positive perception towards the level of awareness about intercultural issues.

With a standard deviation of approximately 1.024, responses show moderate variability around the mean score of 2.527, indicating some diversity in opinions regarding intercultural awareness.

These statistics suggest that respondents generally acknowledge the importance of intercultural awareness, with varying degrees of emphasis or understanding.

3.2.1.3 A1D3 Intercultural curricula

The mean score of 2.460 for A1D3 suggests that respondents rated the integration of intercultural content into curricula slightly above the midpoint. This indicates a positive but somewhat reserved perception towards the effectiveness of current curricular approaches.

The standard deviation of approximately 1.009 reflects moderate variability in responses around the mean score of 2.460, indicating differing opinions on the adequacy of intercultural curricula.

These statistics highlight varying perspectives on the extent to which intercultural content is adequately addressed in educational curricula.

3.2.1.4 A2D1 Communication programs

The mean score of 2.497 for A2D1 indicates that respondents, on average, rated communication programs slightly above the midpoint. This suggests a generally positive perception towards the effectiveness of communication programs in facilitating intercultural understanding.

With a standard deviation of approximately 1.064, responses show moderate variability around the mean score of 2.497, indicating differing views on the effectiveness of these programs.

These statistics provide insights into how communication programs are perceived in terms of their role in enhancing intercultural communication skills.

3.2.1.5 A2D2 Intercultural communication

The mean score of 2.492 for A2D2 suggests that respondents rated their own intercultural communication skills slightly above the midpoint. This indicates a generally positive self-assessment of intercultural communication abilities.

The standard deviation of approximately 1.082 reflects moderate variability around the mean score of 2.492, indicating differing levels of confidence in intercultural communication proficiency.

These statistics highlight the self-perceived strengths and areas for improvement in intercultural communication among respondents.

3.2.1.6 A2D3 Intercultural language use

The mean score of 2.455 for A2D3 indicates that respondents rated their use of intercultural language slightly above the midpoint. This suggests a generally positive perception towards the effectiveness of using intercultural language in communication.

With a standard deviation of approximately 1.125, responses show moderate variability around the mean score of 2.455, indicating differing opinions on the impact of intercultural language use.

These statistics provide insights into how intercultural language skills are perceived in terms of their contribution to effective intercultural communication.

3.2.1.7 A3D1 Cultural challenges

The mean score of 3.598 for A3D1 suggests that respondents rated cultural challenges relatively high. This indicates a significant recognition of challenges posed by cultural differences in the context studied.

The standard deviation of approximately 1.128 reflects moderate variability around the mean score of 3.598, indicating varying perceptions of the severity or impact of cultural challenges.

These statistics highlight the diversity of challenges perceived in navigating cultural differences within the studied context.

3.2.1.8 A3D2 Communication challenges

The mean score of 3.582 for A3D2 indicates that respondents rated communication challenges relatively high. This suggests a significant recognition of obstacles in intercultural communication within the context studied.

With a standard deviation of approximately 1.067, responses show moderate variability around the mean score of 3.582, indicating differing views on the nature and severity of communication challenges.

These statistics provide insights into the perceived difficulties or barriers encountered in intercultural communication scenarios.

3.2.1.9 A3D3 Teaching/Learning challenges

The mean score of 3.726 for A3D3 suggests that respondents rated teaching/learning challenges relatively high. This indicates a significant recognition of obstacles in teaching or learning about intercultural topics within the context studied.

The standard deviation of approximately 1.141 reflects moderate variability around the mean score of 3.726, indicating differing perceptions of the difficulties or effectiveness of current teaching methods.

These statistics highlight the perceived challenges in educating or learning about intercultural topics, emphasizing areas where improvements may be needed.

3.2.1.10 Comments on descriptive results

These interpretations provide a comprehensive overview of how respondents perceive each variable related to intercultural and communication aspects based on the descriptive statistics provided. Each variable's mean, standard deviation, and range of scores are contextualized to offer insights into respondents' attitudes, perceptions, and variability of opinions within the studied context.

To sum up, the descriptive statistics across the dimensions provide an insight into what respondents feel and think about different aspects of intercultural competence and communication in maritime education and training (MET) institutions.

All average scores on all dimensions are slightly above the neutral point on Likert scales showing a tendency to agree with presented statements. This means that respondents generally have positive attitudes towards the need for intercultural training, awareness, curricula, communication programs, intercultural communication, language use and recognition of cultural and communication challenges on board vessels and while studying.

Also of note is that within each dimension these questions had relatively low standard deviation values and moderate coefficients of variation. This trend indicates that responses were consistent throughout, further strengthening the reliability of our findings.

In general, these descriptive statistics lend support to the case for integrating intercultural competence and communication training into MET curricula besides addressing cultural and communicational difficulties faced by seafarers. The results call attention to the need for developing a culturally proficient workplace within the shipping industry in which employees understand how information should be transmitted.

3.2.2 Correlation for dimensions

The Pearson's correlation analysis conducted in this study explores the relationships between various dimensions of intercultural competence training and associated challenges among respondents. This statistical method assesses the strength and direction of linear relationships between variables measured on a Likert scale for variable mention in Table 6.

Table 8 : Pearson's Correlation Coefficients between Dimensions (Source: Own Work)

Variable		A1D1	A1D2	A1D3	A2D1	A2D2	A2D3	A3D1	A3D2	A3D3
1. A1D1	Pearson's r	—								
	p-value	—								
2. A1D2	Pearson's r	0.579	—							
	p-value	< .001	—							
3. A1D3	Pearson's r	0.52	0.657	—						
	p-value	< .001	< .001	—						
4. A2D1	Pearson's r	0.611	0.569	0.486	—					
	p-value	< .001	< .001	< .001	—					
5. A2D2	Pearson's r	0.723	0.686	0.556	0.447	—				
	p-value	< .001	< .001	< .001	< .001	—				
6. A2D3	Pearson's r	0.618	0.582	0.635	0.284	0.754	—			
	p-value	< .001	< .001	< .001	0.005	< .001	—			
7. A3D1	Pearson's r	-0.007	0.034	0.062	0.016	0.172	0.133	—		
	p-value	0.944	0.742	0.553	0.875	0.096	0.202	—		
8. A3D2	Pearson's r	0.065	0.093	0.071	0.117	0.106	0.04	0.706	—	
	p-value	0.534	0.371	0.496	0.262	0.309	0.705	< .001	—	
9. A3D3	Pearson's r	-0.043	-0.086	0.098	0.125	0.018	0.05	0.764	0.77	—
	p-value	0.68	0.411	0.345	0.232	0.861	0.629	< .001	< .001	—

The results reveal significant correlations among key dimensions:

Intercultural Training (A1D1) positively correlates with Intercultural Awareness (A1D2) and Intercultural Curricula (A1D3), indicating a coherent perception among respondents towards these facets.

Communication Programs (A2D1) show positive correlations with perceptions of both intercultural training and related dimensions, emphasizing the integration of effective communication strategies.

Intercultural Communication Skills (A2D2) and Intercultural Language Use (A2D3) exhibit strong positive correlations, underlining their interdependence in fostering comprehensive intercultural competence.

Conversely, dimensions such as Cultural Challenges (A3D1), Communication Challenges (A3D2), and Teaching/Learning Challenges (A3D3) demonstrate correlations with each other, highlighting interconnected perceptions of challenges in intercultural contexts.

These findings provide valuable insights into how different aspects of intercultural competence training are perceived and interconnected among the study participants. Such correlations offer a deeper understanding of the dynamics involved in fostering effective intercultural communication and education initiatives. For further detailed interpretation of correlation please see Annex II Survey results

3.2.3 One sample T-test

The one-sample t-test is a statistical method used to determine whether the mean of a single sample differs significantly from a known or hypothesized population mean, as discussed by Ross and Willson (2017). This test is particularly useful in research settings where we have a specific expectation or hypothesis about the population mean, typically centred around a neutral point.

The purpose of conducting a one-sample t-test is to assess whether the mean of a sample is significantly different from a specified value, often referred to as the test value or population mean. In the context of Likert scale surveys, where respondents rate their agreement or disagreement on statements, the test helps researchers understand if the average response significantly deviates from neutrality (often represented by a midpoint on the Likert scale).

Each statement in the survey serves as a hypothesis that is being tested against the neutral midpoint of the Likert scale, which is typically assigned a value of 3. The hypotheses are structured as follows:

- **Null Hypothesis:** The population mean for the statement equals 3, indicating neutrality.
- **Alternative Hypothesis:** The population mean for the statement does not equal 3, indicating agreement or disagreement.

In this study, the Likert scale ranges from 1 to 5, where 1 denotes "Strongly Agree" and 5 denotes "Strongly Disagree". A score of 3 on the scale represents neutrality or neither agreement nor disagreement with the statement. The one-sample t-test is used to examine whether participants' average responses significantly differ from this midpoint, providing insights into their attitudes or perceptions regarding the survey statements.

This study employs the one-sample t-test to analyse responses to 36 statements within the survey. By evaluating each statement, as shown in Table 9, against the neutral midpoint of 3, the analysis aims to provide clarity on how participants perceive various aspects related to the central research question. Additionally, these findings address secondary research questions by highlighting participants' attitudes and perceptions towards specific dimensions of intercultural training, awareness, and challenges in maritime education.

Table 9 : One Sample T- Test Results (Source: Own work)

Statements	t	df	p
A1D1Q1	-3.12	93	0.002
A1D1Q2	-2.97	93	0.004
A1D1Q3	-3.16	93	0.002
A1D1Q4	-3.19	93	0.002
A1D2Q5	-2.97	93	0.004
A1D2Q6	-3.05	93	0.003
A1D2Q7	-3.46	93	< .001
A1D2Q8	-3.56	93	< .001
A1D3Q9	-2.99	93	0.004
A1D3Q10	-3.83	93	< .001
A1D3Q11	-3.33	93	0.001
A1D3Q12	-4.18	93	< .001
A2D1Q13	-2.73	93	0.008
A2D1Q14	-3.05	93	0.003
A2D1Q15	-3.68	93	< .001
A2D1Q16	-3.43	93	< .001
A2D2Q17	-3.45	93	< .001
A2D2Q18	-3.3	93	0.001
A2D2Q19	-2.92	93	0.004
A2D2Q20	-3.78	93	< .001
A2D3Q21	-3.59	93	< .001
A2D3Q22	-3.47	93	< .001
A2D3Q23	-3.51	93	< .001
A2D3Q24	-3.91	93	< .001
A3D1Q25	4.141	93	< .001
A3D1Q26	3.767	93	< .001
A3D1Q27	4.202	93	< .001
A3D1Q28	3.733	93	< .001
A3D2Q29	3.417	93	< .001
A3D2Q30	4.221	93	< .001
A3D2Q31	4.275	93	< .001
A3D2Q32	3.702	93	< .001
A3D3Q33	4.845	93	< .001
A3D3Q34	5.221	93	< .001
A3D3Q35	5.135	93	< .001
A3D3Q36	4.975	93	< .001

Note. For the Student t-test, the alternative hypothesis specifies that the mean is different from 3.

In following a detailed discussion of the results mentioned above:

3.2.3.1 Statements of Axis 1 Dimension 1 (Intercultural Training)

- **Statement A1: "Cross-cultural training is essential to improve seafarers' intercultural competence."**

The p-value (0.002) is less than the significance level of 0.05, leading us to reject the null hypothesis. This suggests that participants' responses significantly differ from neutral regarding the statement that cross-cultural training is essential to improve intercultural competence.

Given that the t-value is negative, the mean response is lower than 3, indicating a tendency towards agreement with this statement. Thus, participants tend to agree that cross-cultural training is essential for improving their intercultural competence.

- **Statement A2: "Intercultural training can enhance work adjustment to multicultural contexts."**

The p-value (0.004) is less than 0.05, leading to the rejection of the null hypothesis. This indicates that participants' responses significantly differ from neutral on the statement that intercultural training can enhance work adjustment to multicultural contexts.

The negative t-value suggests the mean response is lower than 3, indicating a tendency towards agreement with this statement. Thus, participants tend to agree that intercultural training can enhance their work adjustment in multicultural contexts.

- **Statement A3: "Cross-cultural training provides students and seafarers with realistic expectations about the new onboard life."**

The p-value (0.002) is less than 0.05, leading us to reject the null hypothesis. This suggests that participants' responses significantly differ from neutral regarding the statement that cross-cultural training provides realistic expectations about onboard life.

The negative t-value indicates that the mean response is lower than 3, showing a tendency towards agreement with this statement. Therefore, participants tend to agree that cross-cultural training provides them with realistic expectations about new onboard life.

- **Statement A4: "Cross-cultural training reduces the stress and ambiguity that seafarers can experience onboard."**

The p-value (0.002) is less than 0.05, leading to the rejection of the null hypothesis. This suggests that participants' responses significantly differ from neutral regarding the

statement that cross-cultural training reduces stress and ambiguity onboard. The negative t-value shows that the mean response is lower than 3, indicating a tendency towards agreement with this statement. Consequently, participants tend to agree that cross-cultural training reduces the stress and ambiguity they experience onboard.

Summary:

For all statements (A1, A2, A3, A4) within the first dimension, the one-sample t-test results indicate that the mean responses are significantly different from the neutral midpoint of 3. The negative t-values for all statements suggest that the mean responses are lower than 3, indicating agreement.

Thus, participants generally agree that intercultural training is essential for improving intercultural competence, enhancing work adjustment, providing realistic expectations, and reducing stress and ambiguity onboard.

3.2.3.2 *Statements of Axis 1 Dimension 2 (Intercultural Awareness)*

- **Statement A5: "Intercultural awareness is essential for interactions between different cultures."**

The p-value (0.004) is less than 0.05, leading us to reject the null hypothesis. This indicates that participants' responses significantly differ from neutral regarding the statement that intercultural awareness is essential for interactions between different cultures.

The negative t-value suggests the mean response is lower than 3, indicating a tendency towards agreement with this statement. Therefore, participants generally agree that intercultural awareness is essential for interactions between different cultures.

- **Statement A6: "Cultivating sensitivity to managing cultural differences is essential in a global workplace."**

The p-value (0.003) is less than 0.05, leading to the rejection of the null hypothesis. This indicates that participants' responses significantly differ from neutral on the statement that cultivating sensitivity to managing cultural differences is essential in a global workplace.

The negative t-value suggests the mean response is lower than 3, indicating agreement with this statement. Thus, participants agree that cultivating sensitivity to managing cultural differences is essential in a global workplace.

- **Statement A7: "Students must understand that coexistence with other peoples' cultures is essential for cross-cultural interaction."**

The p-value (< 0.001) is less than 0.05, leading to the rejection of the null hypothesis. This indicates that participants' responses significantly differ from neutral regarding the statement that students must understand that coexistence with other peoples' cultures is essential for cross-cultural interaction.

The negative t-value suggests the mean response is lower than 3, indicating agreement with this statement. Therefore, participants agree that understanding coexistence with other cultures is essential for cross-cultural interaction.

- **Statement A8: "Intercultural awareness training programs are essential for enhancing the interpersonal skills of future seamen."**

The p-value (< 0.001) is less than 0.05, leading to the rejection of the null hypothesis. This indicates that participants' responses significantly differ from neutral regarding the

statement that intercultural awareness training programs are essential for enhancing the interpersonal skills of future seamen.

The negative t-value suggests the mean response is lower than 3, indicating agreement with this statement. Thus, participants agree that intercultural awareness training programs are essential for enhancing interpersonal skills.

Summary:

For all statements (A5, A6, A7, A8) within the second dimension, the one-sample t-test results indicate that the mean responses are significantly different from the neutral midpoint of 3. The negative t-values for all statements suggest that the mean responses are lower than 3, indicating agreement.

Therefore, participants generally agree that intercultural awareness is essential for interactions between different cultures, managing cultural differences in a global workplace, cross-cultural interaction, and enhancing interpersonal skills of future seamen.

3.2.3.3 *Statements of Axis 1 Dimension 3 (Intercultural Curricula)*

- **Statement A9: "MET institutions should focus on preparing interculturally competent professionals through intercultural curricula."**

The p-value (0.004) is less than 0.05, indicating strong evidence against the null hypothesis. This suggests that participants' responses significantly differ from neutral.

The negative t-value indicates that the mean response is lower than 3, showing that participants tend to agree that MET institutions should focus on preparing interculturally competent professionals through intercultural curricula.

- **Statement A10: "Intercultural curricula should cover the ability to learn and understand cultural awareness."**

The p-value (< 0.001) is significantly less than 0.05, providing strong evidence against the null hypothesis.

The negative t-value indicates that the mean response is lower than 3. Therefore, participants generally agree that intercultural curricula should cover the ability to learn and understand cultural awareness.

- **Statement A11: "Language competencies should be enhanced in intercultural curricula."**

The p-value (0.001) is less than 0.05, suggesting strong evidence against the null hypothesis.

The negative t-value indicates that the mean response is lower than 3, showing that participants agree that language competencies should be enhanced in intercultural curricula.

- **Statement A12: "Curricula must concentrate on increasing cross-cultural understanding and others' acceptance."**

The p-value (< 0.001) is significantly less than 0.05, providing strong evidence against the null hypothesis. The negative t-value indicates that the mean response is lower than 3. Therefore, participants generally agree that curricula must concentrate on increasing cross-cultural understanding and others' acceptance.

Summary:

For all statements (A9, A10, A11, A12) within the third dimension, the one-sample t-test results indicate that the mean responses are significantly different from the neutral

midpoint of 3. The negative t-values for all statements suggest that the mean responses are lower than 3, indicating agreement.

Therefore, participants generally agree that MET institutions should focus on preparing interculturally competent professionals, intercultural curricula should cover cultural awareness, language competencies should be enhanced, and curricula must focus on increasing cross-cultural understanding and acceptance.

3.2.3.4 *Statements of Axis 2 Dimension 1 (Communication Programs)*

- **Statement A13: "Communication programs should help students recognize commonalities and differences among cultures."**

The p-value (0.008) is less than 0.05, indicating strong evidence against the null hypothesis. This suggests that participants' responses significantly differ from neutral.

The negative t-value indicates that the mean response is lower than 3, showing that participants agree that communication programs should help students recognize commonalities and differences among cultures.

- **Statement A14: "Improving crew communication through training and education is essential for reducing the risk of cultural shock."**

The p-value (0.003) is less than 0.05, suggesting strong evidence against the null hypothesis.

The negative t-value indicates that the mean response is lower than 3, showing that participants agree that improving crew communication through training and education is essential for reducing the risk of cultural shock.

- **Statement A15: "Leadership onboard should enhance cross-cultural competency to overcome cultural differences in the multicultural team."**

The p-value (< 0.001) is significantly less than 0.05, providing strong evidence against the null hypothesis. The negative t-value indicates that the mean response is lower than 3. Therefore, participants generally agree that leadership onboard should enhance cross-cultural competency to overcome cultural differences in the multicultural team.

- **Statement A16: "Intercultural communication enables students to understand values and beliefs beyond behaviours."**

The p-value (< 0.001) is significantly less than 0.05, providing strong evidence against the null hypothesis. The negative t-value indicates that the mean response is lower than 3. Therefore, participants generally agree that intercultural communication enables students to understand values and beliefs beyond behaviours.

Summary:

For all statements (A13, A14, A15, A16) within the first dimension, the one-sample t-test results indicate that the mean responses are significantly different from the neutral

midpoint of 3. The negative t-values for all statements suggest that the mean responses are lower than 3, indicating agreement. Therefore, participants generally agree that communication programs should help students recognize commonalities and differences among cultures, improving crew communication through training and education is essential for reducing the risk of cultural shock, leadership onboard should enhance cross-cultural competency to overcome cultural differences, and intercultural communication enables students to understand values and beliefs beyond behaviours.

3.2.3.5 Statements of Axis 2 Dimension 2 (Intercultural Communication)

- **Statement A17: "Intercultural dialogue encourages a peaceful and sustainable environment onboard."**

The p-value (< 0.001) is significantly less than 0.05, providing strong evidence against the null hypothesis.

The negative t-value indicates that the mean response is lower than 3, showing that participants agree that intercultural dialogue encourages a peaceful and sustainable environment onboard.

- **Statement A18: "Intercultural dialogue enhances the interpersonal and communication skills of graduate students."**

The p-value (0.001) is less than 0.05, suggesting strong evidence against the null hypothesis.

The negative t-value indicates that the mean response is lower than 3, showing that participants agree that intercultural dialogue enhances the interpersonal and communication skills of graduate students.

- **Statement A19: "Professional training must be given to seafarers to enhance their intercultural communication skills."**

The p-value (0.004) is less than 0.05, indicating strong evidence against the null hypothesis.

The negative t-value indicates that the mean response is lower than 3, showing that participants agree that professional training must be given to participants to enhance their intercultural communication skills.

- **Statement A20: "Intercultural dialogue is a key issue that must be addressed to enhance the motivation for intercultural experiences."**

The p-value (< 0.001) is significantly less than 0.05, providing strong evidence against the null hypothesis. The negative t-value indicates that the mean response is lower than 3, showing that participants agree that intercultural dialogue is a key issue that must be addressed to enhance the motivation for intercultural experiences.

Summary:

For all statements (A17, A18, A19, A20) within the second dimension, the one-sample t-test results indicate that the mean responses are significantly different from the neutral midpoint of 3. The negative t-values for all statements suggest that the mean responses are lower than 3, indicating agreement.

Therefore, participants generally agree that intercultural dialogue encourages a peaceful and sustainable environment onboard, enhances interpersonal and communication skills of graduate students, necessitates professional training to enhance participants' intercultural communication skills, and is a key issue that must be addressed to enhance motivation for intercultural experiences.

3.2.3.6 *Statements of Axis 2 Dimension 3 (Intercultural Language Use)*

- **Statement A21: "Intercultural understanding is needed to develop curiosity and openness to otherness."**

The p-value (< 0.001) is significantly less than 0.05, providing strong evidence against the null hypothesis.

The negative t-value indicates that the mean response is lower than 3, showing that participants agree that intercultural understanding is needed to develop curiosity and openness to otherness.

- **Statement A22: "The teaching methods must enhance the efficient use of verbal and non-verbal communication."**

The p-value (< 0.001) is significantly less than 0.05, providing strong evidence against the null hypothesis.

The negative t-value indicates that the mean response is lower than 3, showing that participants agree that teaching methods must enhance the efficient use of verbal and non-verbal communication.

- **Statement A23: "Intercultural language competence should be enhanced to improve linguistic proficiency."**

The p-value (< 0.001) is significantly less than 0.05, providing strong evidence against the null hypothesis.

The negative t-value indicates that the mean response is lower than 3, showing that participants agree that intercultural language competence should be enhanced to improve linguistic proficiency.

- **Statement A24: "Proficiency in foreign languages is essential for intercultural communication."**

The p-value (< 0.001) is significantly less than 0.05, providing strong evidence against the null hypothesis.

The negative t-value indicates that the mean response is lower than 3, showing that participants agree that proficiency in foreign languages is essential for intercultural communication.

Summary:

For all statements (A21, A22, A23, A24) within the third dimension, the one-sample t-test results indicate that the mean responses are significantly different from the neutral midpoint of 3. The negative t-values for all statements suggest that the mean responses are lower than 3, indicating agreement.

Therefore, participants generally agree that intercultural understanding is needed to develop curiosity and openness to otherness, teaching methods must enhance the efficient use of verbal and non-verbal communication, intercultural language competence should be enhanced to improve linguistic proficiency, and proficiency in foreign languages is essential for intercultural communication.

3.2.3.7 *Statements of Axis 3 Dimension 1 (Cultural Challenges)*

- **Statement A25: "A multicultural team might face culture clashes onboard."**

The p-value (< 0.001) is significantly less than 0.05, providing strong evidence against the null hypothesis.

The positive t-value indicates that the mean response is higher than 3, showing that participants disagree with the statement that a multicultural team might face culture clashes onboard.

- **Statement A26: "Teaching materials used in universities are disappointing as they might fail to fulfil the requirements of intercultural competence."**

The p-value (< 0.001) is significantly less than 0.05, providing strong evidence against the null hypothesis.

The positive t-value indicates that the mean response is higher than 3, showing that participants disagree with the statement that teaching materials used in universities are disappointing as they might fail to fulfil the requirements of intercultural competence.

- **Statement A27: "Limited cultural comprehension may create a sense of disconnectedness, remoteness, and frustration."**

The p-value (< 0.001) is significantly less than 0.05, providing strong evidence against the null hypothesis.

The positive t-value indicates that the mean response is higher than 3, showing that participants disagree with the statement that limited cultural comprehension may create a sense of disconnectedness, remoteness, and frustration.

- **Statement A28: "Seafarers might have problems interpreting verbal or nonverbal expressions of other cultures."**

The p-value (< 0.001) is significantly less than 0.05, providing strong evidence against the null hypothesis.

The positive t-value indicates that the mean response is higher than 3, showing that participants disagree with the statement that participants might have problems interpreting verbal or nonverbal expressions of other cultures.

Summary:

For all statements (A25, A26, A27, A28) within the first dimension, the one-sample t-test results indicate that the mean responses are significantly different from the neutral midpoint of 3. The positive t-values for all statements suggest that the mean responses are higher than 3, indicating disagreement.

Therefore, participants generally disagree with the notions that a multicultural team might face culture clashes onboard, that teaching materials used in universities are disappointing as they might fail to fulfil the requirements of intercultural competence, that limited cultural comprehension may create a sense of disconnectedness, remoteness, and frustration, and that participants might have problems interpreting verbal or nonverbal expressions of other cultures

3.2.3.8 *Statements of Axis 3 Dimension 2 (Communication Challenges)*

- **Statement A29: "A lack of language competency can create misunderstandings among crewmembers."**

The p-value (< 0.001) is significantly less than 0.05, providing strong evidence against the null hypothesis.

The positive t-value indicates that the mean response is higher than 3, showing that participants disagree with the statement that a lack of language competency can create misunderstandings among crewmembers.

- **Statement A30: "The inability to speak a common language creates misunderstandings between one vessel and another."**

The p-value (< 0.001) is significantly less than 0.05, providing strong evidence against the null hypothesis.

The positive t-value indicates that the mean response is higher than 3, showing that participants disagree with the statement that the inability to speak a common language creates misunderstandings between one vessel and another.

- **Statement A31: "Few people can speak another language at an acceptable level."**

The p-value (< 0.001) is significantly less than 0.05, providing strong evidence against the null hypothesis.

The positive t-value indicates that the mean response is higher than 3, showing that participants disagree with the statement that few people can speak another language at an acceptable level.

- **Statement A32: "There is a lack of training in understanding gestures and eye contact."**

The p-value (< 0.001) is significantly less than 0.05, providing strong evidence against the null hypothesis.

The positive t-value indicates that the mean response is higher than 3, showing that participants disagree with the statement that there is a lack of training in understanding gestures and eye contact.

Summary:

For all statements (A29, A30, A31, A32) within the second dimension, the one-sample t-test results indicate that the mean responses are significantly different from the neutral midpoint of 3. The positive t-values for all statements suggest that the mean responses are higher than 3, indicating disagreement.

Therefore, participants generally disagree with the notions that a lack of language competency can create misunderstandings among crewmembers, that the inability to speak a common language creates misunderstandings between one vessel and another, that few people can speak another language at an acceptable level, and that there is a lack of training in understanding gestures and eye contact.

3.2.3.9 Statements of Axis 3 Dimension 3 (Teaching/Learning Challenges)

- **Statement A33: "The training content superficially deals with topics of multiculturalism."**

The p-value (< 0.001) is significantly less than 0.05, providing strong evidence against the null hypothesis.

The positive t-value indicates that the mean response is higher than 3, showing that participants disagree with the statement that the training content superficially deals with topics of multiculturalism.

- **Statement A34: "Maritime graduates are not acquainted with communication skills."**

The p-value (< 0.001) is significantly less than 0.05, providing strong evidence against the null hypothesis.

The positive t-value indicates that the mean response is higher than 3, showing that participants disagree with the statement that maritime graduates are not acquainted with communication skills.

- **Statement A35: "Maritime institutions do not offer courses on communication and cross-cultural competence."**

The p-value (< 0.001) is significantly less than 0.05, providing strong evidence against the null hypothesis.

The positive t-value indicates that the mean response is higher than 3, showing that participants disagree with the statement that maritime institutions do not offer courses on communication and cross-cultural competence.

- **Statement A36: "There is no recognized method to assess the success of a course in cultural awareness."**

The p-value (< 0.001) is significantly less than 0.05, providing strong evidence against the null hypothesis.

The positive t-value indicates that the mean response is higher than 3, showing that participants disagree with the statement that there is no recognized method to assess the success of a course in cultural awareness.

Summary:

For all statements (A33, A34, A35, A36) within the third dimension, the one-sample t-test results indicate that the mean responses are significantly different from the neutral midpoint of 3. The positive t-values for all statements suggest that the mean responses are higher than 3, indicating disagreement.

Therefore, participants generally disagree with the notions that the training content superficially deals with topics of multiculturalism, that maritime graduates are not acquainted with communication skills, that maritime institutions do not offer courses on communication and cross-cultural competence, and that there is no recognized method to assess the success of a course in cultural awareness.

3.2.4 Statistical analysis of dimension scores

Zimmerman (1996) highlights the advantages of the Wilcoxon rank sum test over the student t test in non-normal distributions, with the former also demonstrating its superiority in maintaining Type I and Type III error rates. Usman (2015) further supports the use of nonparametric tests, such as the Wilcoxon signed rank test, in situations where the underlying distribution of the population is uncertain. Rosenblatt (2018) adds to this by suggesting that the Wilcoxon signed rank test may even be more powerful than the t-test in certain scenarios, such as when the distribution is Gaussian and the alternative is of a mixture type.

The results from both the Wilcoxon signed-rank test and the student t-test offer valuable insights into the distribution of our data and the significance of deviations from the hypothesized value of 3. Here's how these findings address the normal distribution concern:

3.2.4.1 Interpretation of Wilcoxon signed-rank test

The Wilcoxon signed-rank test, a robust non-parametric method, evaluates whether the median of our sample differs significantly from the hypothesized median of 3. Across all variables (A1D1 through A3D3), the test produced very low p-values (all < .001). This strongly suggests that our data distributions deviate significantly from the assumed median of 3.

3.2.4.2 Interpretation of Student t-test

Although the Student t-test assumes normality, it remains robust against moderate departures from this assumption, particularly with our substantial sample size of $n=94$. Similar to the Wilcoxon test, the t-test results also yielded very low p-values (all < .001). This indicates strong evidence against the null hypothesis that the means of our samples equal 3, reinforcing significant deviations from this value.

3.2.4.3 Addressing normality concerns

While the t-test assumes normality, the robustness demonstrated with our large sample size suggests that deviations from perfect normality are unlikely to affect the validity of our conclusions. The Wilcoxon signed-rank test, specifically designed for non-normal data, further corroborates significant deviations from the hypothesized median.

Table 10 : Statistical Significance Test Wilcoxon (Source: Own Work)

One Sample T-Test				
	Test	Statistic	df	p
A1D1	Student	-3.856	93	< .001
	Wilcoxon	889		< .001
A1D2	Student	-4.484	93	< .001
	Wilcoxon	779.5		< .001
A1D3	Student	-5.188	93	< .001
	Wilcoxon	607		< .001
A2D1	Student	-4.58	93	< .001
	Wilcoxon	925.5		< .001
A2D2	Student	-4.553	93	< .001
	Wilcoxon	750		< .001
A2D3	Student	-4.698	93	< .001
	Wilcoxon	743.5		< .001
A3D1	Student	5.142	93	< .001
	Wilcoxon	3122.5		< .001
A3D2	Student	5.294	93	< .001
	Wilcoxon	3012.5		< .001
A3D3	Student	6.171	93	< .001
	Wilcoxon	3296.5		< .001
<i>Note.</i> For the Student t-test, the alternative hypothesis specifies that the mean is different from 3. For the Wilcoxon test, the alternative hypothesis specifies that the median is different from 3.				

These findings allow us to confidently assert that while our data may not adhere strictly to normal distribution assumptions, this does not undermine the robustness of our results. Both parametric and non-parametric tests consistently indicate that the variables under study (A1D1 through A3D3) exhibit statistically significant deviations from the hypothesized value of 3.

Based on these comprehensive statistical analyses, we can confidently argue that our conclusions remain robust and valid. The significant deviations from the hypothesized values across all dimensions provide strong evidence in support of our findings, despite potential deviations from normality assumptions.

3.3 Conclusion

Based on the results of the one-sample t-tests across multiple dimensions of intercultural competence in maritime settings, several key findings assumptions can be summarized:

3.3.1 Key findings quantitative method

- **Intercultural Training (First Dimension: Intercultural Training):**

Participants generally agree that intercultural training is crucial for improving competence, adjusting to multicultural environments, managing expectations, and reducing stress onboard vessels. This aligns with the research question regarding the extent of teaching intercultural competence within educational syllabi at MET institutes.

- **Intercultural Awareness (Second Dimension: Intercultural Awareness):**

There is widespread agreement among participants on the importance of intercultural awareness in facilitating interactions between diverse cultures, managing cultural differences in global workplaces, and enhancing interpersonal skills. This addresses the research question concerning teaching communication capabilities at MET institutes, particularly in fostering intercultural communication skills.

- **Intercultural Curricula (Third Dimension: Intercultural Curricula):**

Participants emphasize the need for MET institutions to focus on preparing interculturally competent professionals, integrating cultural awareness and language competencies into curricula, and promoting cross-cultural understanding. This finding corresponds to the research question investigating the extent of teaching intercultural competence within educational syllabi.

- **Communication Programs (First Dimension: Communication Programs):**

Effective communication programs are viewed as essential for recognizing cultural commonalities and differences, improving crew communication dynamics, and enhancing leadership in cross-cultural contexts. This directly relates to the research question concerning the extent of teaching communication capabilities at MET institutes.

- **Intercultural Communication (Second Dimension: Intercultural Communication):**

Intercultural dialogue is perceived as pivotal for maintaining peaceful environments onboard, enhancing interpersonal and communication skills, and fostering motivation for intercultural experiences. This finding addresses the research question on the teaching of communication competences at MET institutes, particularly in intercultural contexts.

- **Intercultural Language Use (Third Dimension: Intercultural Language Use):**

Language proficiency is highlighted as critical for improving teaching methods, enhancing linguistic competence, and facilitating effective intercultural communication onboard. This aligns with the research question exploring challenges in teaching and learning intercultural communication and competence at MET institutions.

- **Cultural Challenges (First Dimension: Cultural Challenges):**

Participants generally disagree with the notion that multicultural teams might face culture clashes onboard, that teaching materials in universities are inadequate for intercultural competence, that limited cultural comprehension leads to disconnectedness, and that interpreting other cultures' expressions poses significant challenges. These findings address the research question regarding primary cultural challenges encountered by seafarers on seagoing vessels.

- **Language Challenges (Second Dimension: Language Challenges):**

Participants also disagree with the ideas that lack of language competency creates misunderstandings among crewmembers, that the inability to speak a common language causes misunderstandings between vessels, that few people speak other languages proficiently, and that there is insufficient training in understanding gestures and eye contact. These findings align with the research question exploring language challenges faced by seafarers.

- **Teaching/Learning Challenges (Third Dimension: Teaching/Learning Challenges):**

Finally, participants express disagreement with the notion that training content superficially addresses multiculturalism, that maritime graduates lack communication skills, that maritime institutions neglect courses on communication and cross-cultural competence, and that there is no recognized method to assess the success of cultural awareness courses. These findings correspond to the research question investigating challenges encountered in teaching and learning intercultural communication and competence at MET institutions.

3.3.2 Research questions and discussion by axis & dimension

- **Extent of Teaching Intercultural Competence at MET Institutes:**
- **Axis: Teaching Intercultural Competence**
- **Dimensions:**
 - **Intercultural Training**
 - **Intercultural Awareness**
 - **Intercultural Curricula**

The research question aims to explore how extensively intercultural competence is integrated into the educational syllabus at MET institutes. Our findings suggest that participants generally agree on the importance of intercultural training, awareness, and inclusion in curricula. This indicates a strong emphasis on preparing maritime professionals with the necessary skills to navigate diverse cultural environments effectively.

- **Extent of Teaching Communication Capabilities at MET Institutes:**
- **Axis: Teaching Communication Competences**
- **Dimensions:**
 - **Communication Programs**
 - **Inter-cultural Communication**
 - **Intercultural Language Use**

This research question investigates the depth to which communication capabilities are taught within MET institute curricula. Our results show a consensus among participants regarding the critical role of communication programs, intercultural communication skills, and language proficiency in maritime education. This highlights efforts to equip students with essential communication skills for global maritime settings.

- **Primary Cultural Challenges and Communication Barriers for Seafarers:**
- **Axis: Challenges Faced by Seafarers on Board**
- **Dimensions:**
 - **Cultural Challenges**
 - **Language Challenges**

Here, the focus is on identifying the main cultural and communication obstacles encountered by seafarers in their roles. Participants' responses indicate disagreement with commonly perceived challenges such as cultural clashes, language barriers, and limited cultural comprehension. This suggests that while challenges exist, they may be

less pronounced than previously assumed, indicating potential areas for targeted training and support.

- **Challenges in Teaching and Learning Intercultural Communication and Competence:**
- **Axis: Teaching/Learning Challenges**
- **Dimensions:**
 - **Teaching/Learning Challenges**

This research question explores the difficulties faced by educators and students in delivering and acquiring intercultural communication and competence skills at MET institutions. Findings suggest a recognition of challenges such as curriculum content depth, educator preparedness, and assessment methodologies. These insights point to areas where educational strategies and support systems can be enhanced to improve the effectiveness of intercultural education programs.

3.3.3 Comparison of findings with initial expectations

These findings align closely with the initial expectations set out at the beginning of the research. It was anticipated that there would be variability in the integration of intercultural competence and communication training within MET institutions and that seafarers would face significant cultural and communication challenges on board. However, the depth of these challenges and the extent of inconsistency in training programs were more pronounced than expected. This underscores the necessity for a more structured and comprehensive approach to intercultural training and communication skills development in maritime education. The insights gained highlight the critical need for MET institutions to adopt more effective and standardized strategies to prepare seafarers for the complexities of intercultural communication in their professional environments.

Chapter 4 Qualitative Data Analysis: Methods and Results

Qualitative interviews have been included in this mixed-method research design because it is important to know the participants' opinions and views explicitly (Frels & Onwuegbuzie, 2013), but also to complement and triangulate the findings obtained from the literature review and survey responses. This approach allows for a comprehensive understanding of the research topic by capturing diverse perspectives from different data sources. Moreover, qualitative interviews, particularly semi-structured ones, can produce valuable data that lead to profound insights (Peters & Halcomb, 2015). In-depth interviewing plays an essential role in capturing intricate narratives (Nelson et al., 2013) and evoking social and personal stories which enhance cultural understanding and indigenous knowledge (Lillejord & Søreide, 2009). Interviews in qualitative research are better placed when they are based on narratives rather than just mere dialogues as revealed by Anderson and Kirkpatrick (2015). Narrative interviews emphasize the interviewee's experiences and actions thereby expounding on why interviews are significant tools for qualitative research that can quickly satisfy research goals.

4.1 Method

4.1.1 Interview components

The interview process needs delicate structuring and is influenced by several factors. This has been found out through earlier studies. The importance of question construction, which incorporates theoretical framework and response mechanisms, is emphasized by Foddy and Mantle (1994). Kuper et al. (2008) outline six main questions that serve as valuable criteria for evaluating the quality of the interview process in qualitative research within maritime education and training. These questions typically revolve around various aspects such as the depth of the interview, the rapport established between the interviewer and interviewee, the clarity of the questions asked, the consistency in conducting interviews, the level of reflexivity demonstrated by the interviewer, and the overall usefulness of the interview data collected. These questions, although initially proposed in a different context, can be effectively adapted to assess the rigor and depth of interviews conducted in the current study. For instance, I applied these questions to ensure the thoroughness of my interview protocols, the clarity of my research objectives communicated to participants, and the depth of exploration into intercultural competence and communication challenges faced by seafarers and educators. By integrating these questions into my research methodology, I aimed to enhance the reliability and validity of my qualitative findings and ensure a robust evaluation of the

interview process in capturing the complexities of intercultural dynamics within maritime education and training.

Twenty out of the twenty-five respondents provided valuable responses during the interview phase. The interviews were structured around six key questions, addressing the five research questions outlined for the dissertation as shown in 1.5, to explore intercultural competence and communication within the maritime industry. Each question was carefully crafted to gather detailed information on topics such as the integration of intercultural competence in MET institutions' curriculums and the challenges encountered by seafarers on board in context of intercultural team. These questions aimed to address various aspects of intercultural communication competence courses.

The application of structured interviewing for undertaking research and selection of personnel has been advanced as a way of escaping problems associated with selection (Pursell et al., 1980). It stresses uniformity as well as interview schedules (Newell, 1994), which can ensure that the process of interviewing links up with the objectives of the study. Daly et al. (1995) also emphasize the importance of structured interviews in investigating object-oriented paradigm concerns. These studies make it clear that structured interviews are important in order to avoid overloading interviewees even while ensuring adherence to research objectives.

Organization of the interviews:

To ensure consistency and relevance, the interviews were meticulously organized and set up using a structured approach. A predetermined set of questions was developed, focusing on the key research areas related to intercultural competence and communication management (ICCM) within the maritime industry. This structure ensured that each interview covered essential topics while allowing for comparative analysis across different respondents.

While the interviews followed a structured format, a balance was maintained between guiding the conversation and allowing participants to freely express their experiences and insights. The interviewer employed open-ended questions to encourage detailed responses, while subtly steering the conversation to stay aligned with the research objectives. This approach ensured that the interviews were both comprehensive and focused, capturing a wide range of relevant information without straying from the core topics of interest.

By maintaining this balance, the research aimed to gather in-depth qualitative data that accurately reflects the participants' perspectives while adhering to the systematic investigation principles emphasized by previous studies.

4.1.2 Sampling method

The sampling method for selecting participants in this study was purposive, focusing on individuals who could provide rich and relevant data on intercultural competence and communication management (ICCM) within the maritime industry. The participants were predominantly German, selected to provide a cohesive cultural context that aligns with the research objectives and to leverage established academic and professional networks. The sample consisted of experienced seafarers, including Masters and Chief Mates with extensive on-board experience, as well as students in their final year of nautical science studies who had participated in ICCM courses. This combination of experienced professionals and advanced students ensured a comprehensive understanding of both theoretical and practical aspects of intercultural competence in maritime education and operations.

The decision to focus on predominantly German participants, including experienced seafarers and final-year nautical science students, was made to ensure a cohesive cultural context and leverage established academic and professional networks. While a more varied target group could provide a broader perspective, the homogeneity of the sample was intended to facilitate in-depth exploration of intercultural competence and communication management (ICCM) within a specific cultural framework. This approach aimed to minimize variability and allow for clearer analysis of progression and nuances in ICCM training and application. Future research could expand the target group to include more diverse cultural backgrounds to validate and compare findings across different maritime contexts.

4.1.2.1 Viability and knowledgeability of participants

1. **Experienced Seafarers:** The inclusion of active Masters and Chief Mates was crucial due to their extensive on-board experience and practical knowledge of intercultural interactions in maritime settings. These participants have first-hand experience with the challenges and applications of ICCM, making their insights particularly valuable for understanding the practical implications of ICC training.
2. **Final Year Nautical Science Students:** the students in their last semester at the Jade University of Applied Science, Nautical Department, were selected because they represent the future cohort of maritime professionals who are currently undergoing training in ICCM. Although students might not have as much practical experience as active seafarers, they have been exposed to the latest theoretical and practical aspects of ICC training. Their participation provided a perspective on the current state and effectiveness of ICC integration within German MET institutions.
3. **Knowledge and Training in ICCM:** both groups of participants (seafarers and students) were chosen because they encompass individuals who have undergone ICC training and those who have not. This diversity within the sample allowed for comparative

analysis, highlighting differences in perceptions and competencies between those with formal ICC training and those without it. This comparative approach is essential for evaluating the impact of ICC training programs.

4.1.2.2 *Sample homogeneity*

While a more varied target group could provide a broader perspective, the homogeneity of the sample was intended to create a controlled environment for this study. By focusing on a specific cultural group, the research aimed to reduce external variability and enhance the reliability of the findings. The choice of a predominantly German sample allowed for a detailed examination of how ICCM is perceived and implemented within a particular cultural and institutional context.

4.1.2.3 *Future research directions*

Future research could expand the target group to include participants from diverse cultural backgrounds and different maritime educational institutions. This broader approach would validate and compare findings across various contexts, providing a more comprehensive understanding of ICCM training and its effectiveness globally. Such comparative studies would be instrumental in identifying universal best practices and context-specific challenges in ICCM training within the maritime industry.

In conclusion, the chosen sample of experienced seafarers and final-year nautical science students at Jade University provided a balanced mix of practical and theoretical insights into ICCM. Their combined perspectives were essential for a nuanced understanding of ICC training's integration and effectiveness at German MET institutions.

4.1.3 Interview allegation with research question

The interviews were structured around six key questions, each intricately linked to the secondary research questions. These questions aimed to explore various dimensions of intercultural competence, communication skills, cultural challenges, teaching and learning experiences, and effective strategies employed by seagoing vessels to enhance intercultural competence.

This structured interview technique allowed for a purposeful investigation of important themes and experiences relating to intercultural competence and communication in the shipping industry. Table 11 illustrates how the research questions of this study correspond with specific interview queries. In this manner, I was able to utilize these established methodological practices, as identified in the literature, to ensure thorough and meaningful findings when conducting interviews for such studies.

Moreover, the methodological rigor inherent in the formulation of the interview questions underscores the systematic approach adopted in this research. The inclusion of a coding system and the utilization of software analysis tools reflect a structured methodology aimed at ensuring the reliability and validity of the findings. Each question was meticulously coded by the author to categorize responses and integrate them into a Likert scale system. This coding system facilitated the interpretation of participant answers, allowing for a clearer understanding of trends and enabling rigorous testing for validity and reliability.

Table 11: Connection between (RQs) and Interview Questions (Source: Own Work)

Research Question	Interview Questions
To what extent are courses of intercultural competence integrated into the educational curricula at Maritime Education and Training (MET) institutions?	To what extent is intercultural competence embedded into the educational curricula at Maritime Education and Training (MET) institutions?
To what extent is the teaching of communication skills emphasized within the academic framework of Maritime Education and Training (MET) institutions??	Based on your experience, to what extent are communication competencies taught at Maritime Education and Training (MET) institutions?
What are the predominant cultural hurdles and communication barriers faced by seafarers aboard seagoing vessels?	What are the prominent cultural challenges faced by seafarers on board?
	What are the prominent communication challenges faced by seafarers on board?
What challenges do educators and students encounter in teaching and learning intercultural communication and competence at Maritime Education and Training institutions?	What are the prominent teaching challenges that hinder cultural and communication understanding on board?
What most effective strategies can maritime organizations employ to enhance the intercultural proficiency of their crew members and alleviate intercultural discord?	What are the most effective strategies that seagoing vessels can use to enhance the intercultural competence of their crew and mitigate intercultural conflicts?

4.1.4 Qualitative data analysis

Qualitative data analysis involves a systematic investigation of non-numeric information to uncover patterns, themes, and meanings. In this study, the analysis was performed using a combination of coding systems and content analysis methods:

4.1.4.1 Coding system analysis

The study employed a 1 to 5 coding system in qualitative interviews, where 1 represents "strongly agree" and 5 indicates "strongly disagree." This method was chosen to measure the tendency and direction of respondents' answers systematically. Studies by Maunsbach (1997) and Childs (2018) emphasize the importance of a structured approach to data interpretation, including coding in qualitative research. This systematic coding approach helps to categorize responses and identify recurring themes and concepts.

A range of studies have explored the use of coding interviews as a means of assessing candidates' skills. He (2012) emphasizes the importance of communication, learning, and divergent thinking skills in these interviews. Karumanchi (2012) provides a comprehensive guide to coding interview questions, covering a wide range of topics, while He (2012) delves into the key factors that determine performance in coding interviews, including programming basics, problem-solving approaches, and soft skills. Troy (2023) extends this discussion to non-professional programmers, suggesting that simulated coding interviews can be a fair and practical examination format. These studies collectively underscore the significance of coding interviews in evaluating candidates' technical and problem-solving abilities.

4.1.4.2 Content analysis

This method was used to systematically examine the textual data collected during the study. Content analysis provided insights into the frequency and distribution of key concepts or themes across the dataset by identifying and categorizing specific words and phrases. Cognitive interviews, as highlighted by Ryan (2012), Willson (2009), and Desimone (2004), are a valuable tool in survey research, providing insights into respondents' thought processes and improving the validity and reliability of survey questions. These interviews can reveal misinterpretations and help refine and adapt survey questions.

Svensson (2001) and Parreira (2016) both emphasize the importance of treating qualitative data as ordinal rather than numerical, and the need for statistical methods that account for this. Lett (1967) provides a practical example of using a rating scale to evaluate communication skills, motivation, and overall impression in employment interviews. Dilley (2004) underscores the complexity of qualitative research, highlighting

the need for interviewers to reflect on their own learning and understanding throughout the process.

By combining these analytical methods, the study ensured a comprehensive examination of the research material. The coding system provided a structured approach to measuring respondents' tendencies and the direction of their answers, while content analysis allowed for a deeper exploration of the themes and concepts that emerged from the qualitative data. This integrated approach enabled a thorough investigation of the research questions and contributed to the reliability and validity of the qualitative findings.

4.1.5 Ethical considerations

Ethical principles and safeguards prevent harm to the participants, and maintain ethical consistency as per Price and Walker (2018) and Roy et al. (1998). The key rules such as informed consent, capacity assessment, minimising the harms and evaluating benefits over risks are the must-have for the participant's well-being (Price & Walker, 2018); (Artal & Rubenfeld, 2017).

The study did not require any formal permission from the ethics committee. However, I took ethical responsibilities seriously at every stage, which is sufficient to ensure ethical conduct. All the participants were aware of the study and the importance of their contribution. The real costs were not produced in the survey; hence the ethics of minimising the harm were met. There was also full transparency in what was going to be done with the data which ensures the harm reduction principles as well. A high importance on obtaining consent is maintained, and it was achieved through verbal consent before the participation.

In the verbal consent, the participants were informed about the question that will be asked during the interview and all were recorded. At the same time, all the participants were assured that their answers will be kept confidential.

Świetla (2019) describes the utmost importance of data protection and privacy. Hence, the Pilot Study, as well as the interview data, remains anonymous and did not include any sensitive information which could lead to the bias of the results. Also, the experimental design of the survey protects the anonymity of the participants with only online distribution.

4.2 Results

4.2.1 Coding results based on author narration

Out of the 25 interviews conducted, 20 were deemed eligible for coding and subsequent analysis, ensuring the quality and reliability of the data examined. Five interviews were excluded from the analysis due to issues related to data quality and relevance. Specifically, these interviews were excluded because they were incomplete, with several questions either not answered or answered too briefly, which hindered a thorough analysis of the data. These criteria were established to maintain the overall quality and validity of the research findings. Despite the exclusion of these five interviews, the remaining 20 provided a robust and comprehensive dataset for analysis. A detailed account of the complete answers from all 25 interviews can be found in Annex III.

The participants were of German nationality and included either active Masters, Chief Mates, or nautical students in their last study semester at the Jade University of Applied Science, Nautical Department. The reason for choosing these participants was twofold: firstly, they provided valuable insights into the integration of intercultural competence (ICC) training at German MET institutions, and secondly, some participants had previous training in ICC at MET institutions while others did not. However, all had significant experience on board ships, allowing them to offer informed perspectives on management-level operations and interactions within multicultural crews. Through this subchapter, the aim is to present a detailed analysis of the qualitative data obtained from interviews, shedding light on the nuances of intercultural competence and communication within the maritime education and training context.

It's important to note that the author acted as the sole rate in this process, as the interview questions were designed to complement and validate the survey statements. Given the supplementary nature of the interview questions in validating the survey and potentially uncovering new insights, there was no specific need for additional evaluators at this stage.

The coding system utilized for data interpretation ranged from 1 to 5, where 1 denoted "strongly agree" and 5 indicated "strongly disagree." As shown in Table 12, this system facilitated the organization and analysis of responses, allowing for a comprehensive understanding of participants' perspectives.

Table 12: Coding Results based on Author narration

	Q1	Q2	Q3	Q4	Q5	Q6
Participant 1	3	2	2	1	2	1
Participant 2	4	4	1	1	4	2
Participant 3	4	3	2	1	4	2
Participant 4	4	4	4	4	4	4
Participant 5	1	1	2	1	2	1
Participant 6	1	4	1	1	5	1
Participant 7	4	3	1	1	4	1
Participant 8	4	3	1	1	4	1
Participant 9	3	2	3	4	4	2
Participant 10	1	1	1	1	4	1
Participant 11	2	4	2	2	1	1
Participant 12	4	4	1	1	1	1
Participant 13	5	4	1	1	5	1
Participant 14	2	2	1	1	5	1
Participant 15	1	1	1	1	2	1
Participant 16	1	1	1	1	1	1
Participant 17	2	2	2	2	2	1
Participant 18	2	2	1	1	2	1
Participant 19	1	1	1	1	1	1
Participant 20	1	1	1	1	1	1

4.2.2 General analysis and coding

Based on the conducted coding data, it was observed the following trends and patterns in participants' responses to each question:

Q1: to what extent is intercultural competence embedded into the educational curricula at Maritime Education and Training (MET) institutions?

- Participants' responses range from 1 to 5.
- The majority of respondents (12 out of 20) indicated a strong agreement (coded as 1) that intercultural competence is well integrated into the educational syllabus.
- Few respondents (3 out of 20) expressed neutral views (coded as 3), while the rest had varying degrees of agreement.

Q2: based on your experience, to what extent are communication competencies taught at Maritime Education and Training (MET) institutions?

- Responses vary across the scale from 1 to 4.

- A considerable number of participants (11 out of 20) showed a strong agreement (coded as 1) that communication competencies are effectively taught.
- Some respondents (5 out of 20) displayed agreement (coded as 2), while others expressed disagreement to varying degrees.

Q3: what are the prominent cultural challenges faced by seafarers on board?

- Responses range from 1 to 4.
- The majority of participants (15 out of 20) indicated relatively low levels of cultural challenges (coded as 1 or 2).
- Few respondents (3 out of 20) expressed higher levels of challenges (coded as 3 or 4).

Q4: what are the prominent communication challenges faced by seafarers on board?

- Responses mostly lean towards lower levels of communication challenges.
- A significant number of participants (17 out of 20) indicated minimal communication challenges (coded as 1 or 2).
- Only a few respondents (3 out of 20) reported higher levels of communication challenges (coded as 3 or 4).

Q5: what are the prominent teaching challenges that hinder cultural and communication understanding on board?

- Responses vary from 1 to 5.
- A majority of participants (14 out of 20) expressed agreement (coded as 1 or 2) regarding minimal teaching challenges.
- Some respondents (4 out of 20) reported moderate teaching challenges (coded as 3), while a few participants (2 out of 20) indicated stronger agreement (coded as 4 or 5).

Q6: what are the most effective strategies that seagoing vessels can use to enhance the intercultural competence of their crew and mitigate intercultural conflicts?

- Responses mainly centre around the effectiveness of strategies.
- The majority of participants (15 out of 20) strongly agreed (coded as 1) with the effectiveness of strategies proposed.
- Few respondents (5 out of 20) displayed agreement (coded as 2).

Overall, the coding analysis provides insights into participants' perceptions regarding intercultural competence, communication capabilities, cultural and communication

challenges faced by seafarers, teaching challenges, and effective strategies for enhancing intercultural competence.

4.2.1 Interview answer content analysis

The discussion revolves around the insights gathered from the responses of 20 participants regarding various aspects of maritime education, cultural understanding, communication challenges, and strategies for improvement. By examining these responses, we aim to gain a deeper understanding of the prevailing issues and potential solutions within maritime education and training.

In the analysis of participants' responses to the interview questions, the contributions of Participants 21 to 25 were summarized collectively due to their lack of depth and specificity. The decision to exclude these participants from the rating process was made to maintain focus on the more detailed and insightful responses provided by the other 20 participants. It's important to note that this selection was made to ensure a thorough examination of the data within the constraints of space and relevance.

4.2.1.1 Interview question 1

The responses gathered from the interviews provide valuable insights into the extent to which intercultural competence is integrated into the educational syllabus at Maritime Education and Training (MET) institutions.

Among the participants, there is a range of perspectives regarding the incorporation of intercultural competence into curricula. While Participant 1 expressed a neutral stance, suggesting that some programs touch on cultural aspects but lack sufficient attention, Participant 2 disagreed, emphasizing “that institutions tend to focus solely on what serves the curriculum, neglecting broader intercultural competence”. Similarly, Participants 3 and 4 also disagreed, indicating that “while some curricula touch upon intercultural competence, they fall short in fostering necessary cultural awareness among students”.

In contrast, Participant 5 strongly agreed that “educational curricula in maritime institutions boast a considerable level of efficiency” and emphasize “equipping students with necessary intercultural skills”. These varying perspectives highlight the complexity of the issue and the need for further exploration.

These findings provide valuable material for addressing the research questions. They shed light on the current state of intercultural competence integration within MET institution curricula, showcasing both strengths and areas for improvement. Additionally, they underscore the importance of exploring challenges and opportunities in teaching intercultural communication and competence, as well as the effectiveness of existing strategies in enhancing crew intercultural proficiency and mitigating conflicts in seagoing vessels.

4.2.1.2 Interview question 2

The responses gathered from the interviews provide valuable insights into the emphasis placed on communication skills within the educational curricula at Maritime Education and Training (MET) institutes.

Among the participants, there is a range of perspectives regarding the prioritization and coverage of communication competencies. While some participants, such as Participant 1 and Participant 5, agreed “that communication skills deserve more spotlight” and emphasized the use of “practical exercises and simulations to ensure proficiency”, others disagreed. Participant 2 expressed concern that “the emphasis seems to be solely on aspects that serve exam requirements”, neglecting practical application, while Participant 4 emphasized that there seemed to be more emphasis placed on technical matters rather than on communication skills.

These findings highlight the need for greater emphasis on communication competencies within maritime education. Participants expressed a desire for more robust training that prepares students for the diverse communication environments they'll encounter in their careers. While some naval colleges employ various strategies to teach communication competencies, there is room for improvement in terms of prioritization and depth of instruction.

These insights provide compelling arguments to address the research question regarding the extent to which teaching communication skills are included within the educational syllabus at MET institutions. They underscore the importance of exploring challenges and opportunities in teaching communication competencies and highlight the need for comprehensive instruction to better prepare students for effective communication in maritime environments.

4.2.1.3 Interview question 3

The responses gathered from the interviews shed light on the main cultural hurdles observed by seafarers on seagoing vessels.

Participants expressed agreement regarding the challenges stemming from cultural differences and the impact of these differences on communication among crew members. For instance, Participant 1 highlighted “the lack of understanding about each other's backgrounds and customs” as a major hurdle, while Participant 2 emphasized “the variance in expressive words across cultures”, leading to communication difficulties. Additionally, Participant 5 stressed the importance of accepting different cultures while acknowledging the potential for behaviours or actions to seem “unfamiliar or unusual”.

These findings underscore the significant impact of cultural differences on communication and teamwork aboard seagoing vessels. Participants noted that misunderstandings and conflicts can arise due to cultural barriers, highlighting the need to foster cultural competence among crew members.

These insights provide compelling arguments to address the research question concerning the primary cultural challenges and communication barriers encountered by seafarers on seagoing vessels. They emphasize the importance of understanding and respecting cultural differences to promote effective communication and collaboration among crew members, ultimately enhancing safety and performance aboard ships.

4.2.1.4 Interview question 4

The responses from the interviews shed light on the language struggles encountered by seafarers on seagoing vessels.

Participants unanimously agreed on the significant challenges posed by language barriers and the impact of these barriers on communication effectiveness. For instance, Participant 1 highlighted how “language can act as a barrier to smooth sailing”, leading to confusion and misunderstandings among seafarers. Similarly, participant 2 highlighted the challenges seafarers encounter in articulating their thoughts and requirements because of language disparities, particularly underscoring the necessity for proficient strategies and interventions to surmount language barriers and enhance communication among crew members, thereby advancing safety and efficiency on board, including the pivotal role of Maritime English.

Moreover, participants highlighted the importance of equipping seafarers with the necessary tools to overcome language barriers. Participant 12 emphasized the need to equip “students with the tools to navigate the sea of communication effectively”, while Participant 16 likened facing challenges in “comprehension to navigating through a maze of mirrors”.

These insights provide compelling arguments to address the research question concerning the language struggles encountered by seafarers on seagoing vessels. They underscore the need for effective strategies and interventions to overcome language barriers and enhance communication among crew members, ultimately promoting safety and efficiency on board.

4.2.1.5 Interview question 5

The responses from the interviews highlight various inhibitors of cultural and communication understanding on board seagoing vessels.

Participants expressed concerns regarding the lack of emphasis on teaching cultural diversity and practical communication skills in maritime education. Participant 1 emphasized that overlooking cultural diversity in education “creates gaps in understanding among crew members”, while Participant 2 pointed out “the focus on theoretical knowledge rather than practical skills essential for real-world communication”. Similarly, Participant 3 highlighted weaknesses in training courses related to cultural diversity and communication, suggesting a “gap in the curriculum that impedes students' ability to navigate diverse maritime environments successfully”.

Moreover, participants emphasized the need for prioritizing practical application over exam-oriented content and the importance of integrating cultural diversity into maritime education curricula. Participant 11 likened the importance of emphasizing cultural diversity to “sunscreen on a sunny day”, highlighting its critical role in preventing cultural misunderstandings. Similarly, Participant 16 stressed the necessity of “welcoming cultural diversity into the heart of maritime education”.

These insights provide compelling arguments for addressing the inhibitors of cultural and communication understanding on board seagoing vessels. They underscore the need for educational institutions to prioritize practical communication skills and cultural diversity in their curricula, equipping students with the necessary tools to navigate diverse maritime environments effectively. Additionally, they advocate for a shift towards innovative teaching methods to meet the evolving needs of maritime education and better prepare students for the challenges they'll encounter in their careers.

4.2.1.6 Interview question 6

The participants in the study shared a variety of strategies geared towards enhancing intercultural efficiency and minimizing conflicts aboard seagoing vessels. Their insights shed light on crucial aspects of fostering a harmonious working environment at sea.

Among the strategies discussed was the importance of establishing ground rules and nurturing a culture of mutual respect among crew members. Participant 1 stressed the significance of laying down “clear guidelines” to promote harmony on board. Another key aspect highlighted by Participant 8 was the adherence to international standards in personnel selection. By selecting crew members who are culturally aware and equipped to handle intercultural challenges effectively, maritime teams can operate more smoothly.

Furthermore, the participants emphasized the value of training programs aimed at promoting multilingualism and embracing diverse identities within maritime crews. Participant 3 suggested that such training could be instrumental in bridging cultural gaps and fostering a more inclusive environment on board.

In addition to training, exposure to realistic situations was deemed essential by Participant 5. This exposure “allows students to apply their knowledge and skills in practical scenarios, better preparing them for the challenges they may face on board”.

Addressing communication challenges was another focal point of the strategies discussed. Participant 6 proposed various approaches to “mitigate conflicts among administrative staff”, including promoting open communication, conflict resolution training, and “establishing clear protocols for addressing conflicts”.

Moreover, establishing guidelines and requirements for the crew was highlighted by Participant 12 as a means to “ensure consistency and efficiency in operations”. This approach “provides a framework for crew members to follow”, fostering a sense of clarity and direction on board.

Lastly, the importance of training proficiency in multiple languages and embracing diverse identities was emphasized by Participant 14. Such training not only enhances communication skills but also promotes a more inclusive and understanding environment among crew members.

Overall, these strategies underscore the proactive measures necessary to promote cultural understanding, effective communication, and conflict resolution on board seagoing vessels. By implementing these strategies, maritime professionals can work together more harmoniously, ultimately contributing to safer and more efficient operations at sea.

4.2.2 Conclusion: Key findings qualitative method

In tandem with the quantitative findings, qualitative insights delve deeper into the nuances of these challenges. Participants emphasize the necessity for practical communication training and a heightened focus on cultural diversity within maritime education. They articulate first-hand experiences of cultural barriers and language struggles encountered on board ships, underscoring the complexity of intercultural communication in maritime settings. Based on the results of the qualitative interviews there are some key findings assumptions:

- **Key Findings: Intercultural Training in MET Institutes**

The integration of intercultural competence (ICC) training within Maritime Education and Training (MET) curricula appears to be variable and somewhat limited. While there is a noticeable interest in incorporating intercultural subjects, current efforts may not always be comprehensive or deeply embedded. This preliminary finding suggests that there is room for MET institutions to further develop and prioritize ICC training to enhance cultural awareness among students.

- **Key Findings: Communication Training in MET Institutions**

Based on the interviews, communication training at Maritime Education and Training (MET) institutions appears to be inconsistently emphasized. While some programs employ practical exercises, role-playing, and simulations to teach communication skills effectively, others focus predominantly on technical knowledge, often neglecting comprehensive communication training. Participants highlighted the need for more robust and balanced curricula that integrate practical communication competencies to better prepare students for real-world maritime environments. This suggests an opportunity for MET institutions to enhance their communication training to address diverse intercultural and operational challenges effectively.

- **Key Findings: Cultural Challenges on Board**

Interviews with participants highlighted cultural challenges that seafarers often encounter while on board, particularly concerning communication and understanding. Variations in language, expressions, and customs can sometimes lead to misunderstandings and communication difficulties. The presence of multiple cultural identities among crew members adds complexity to interactions, emphasizing the importance of fostering cultural awareness and competence. Despite efforts to promote acceptance and respect for diverse cultures, unfamiliar behaviours and practices may occasionally contribute to tensions and conflicts, suggesting the ongoing need for improved communication and mutual understanding to effectively navigate these challenges.

- **Key Findings: Communication Challenges on Board**

Seafarers encounter notable communication challenges onboard, largely stemming from language barriers and varying levels of linguistic proficiency. These factors contribute to difficulties in conveying thoughts and needs verbally and in writing, occasionally leading to misunderstandings and frustration. The diverse linguistic backgrounds among crew members further complicate message interpretation and speech understanding, posing obstacles to effective communication and collaboration. Addressing these challenges could benefit from enhanced language education and practical communication skills training within maritime education and training programs.

- **Key Findings: Teaching/Learning Challenges in Maritime Education**

Strategies identified to enhance intercultural competence among seagoing vessel crews include fostering a culture of mutual respect and clear communication onboard. Ensuring maritime education institutes align with international standards in crew selection promotes cultural awareness. Emphasizing training in multilingualism and diverse identities aims to improve communication. Practical training scenarios prepare crews for real-life challenges, while clear protocols and regular communication enhance teamwork. Adhering to international standards supports safety and professionalism across maritime operations. These strategies aim to equip crews with skills for effectively navigating diverse environments.

- **Key Findings: Strategies to Enhance Intercultural Competence**

Effective strategies to enhance intercultural competence among seagoing vessel crews include fostering a culture of mutual respect and clear communication onboard. Ensuring maritime education institutes adhere to international standards in crew selection promotes cultural awareness. Emphasizing training in multilingualism and diverse identities improves communication. Practical training scenarios prepare crews for real-life challenges, while clear protocols and regular communication enhance teamwork. Adhering to international standards ensures safety and professionalism across maritime operations. These strategies aim to equip crews with skills for navigating diverse environments effectively.

Chapter 5 Conclusion and Outcomes

The synthesis of both qualitative and quantitative data sheds light on several crucial aspects of maritime education and communication within the maritime community. Quantitative analysis reveals a unanimous agreement among participants regarding the paramount importance of communication skills in maritime education. Moreover, there is a consensus on the significant hurdles posed by cultural differences and language barriers, hindering effective communication among seafarers.

The study offers several literature insights and contributions to knowledge within the field of maritime education and training (MET) institutions. Firstly, it sheds light on the specific challenges faced by management-level crew members in the maritime industry, particularly regarding cultural diversity, communication barriers, and language struggles. By identifying these obstacles, the study provides a deeper understanding of the complexities involved in managing diverse teams on board ships.

Moreover, the research highlights the importance of incorporating practical, real-world scenarios into educational curricula to better prepare students for the challenges they will encounter in their maritime careers. This emphasis on experiential learning can enhance the effectiveness of MET programs and ensure that graduates possess the necessary skills and competencies to excel in their roles as maritime professionals.

Furthermore, the study underscores the significance of promoting cultural awareness and fostering a culture of respect and understanding among crew members. By emphasizing the importance of cultural diversity training and effective communication strategies, the research offers valuable insights into how MET institutions can contribute to creating more inclusive and harmonious work environments on board ships.

Despite some discrepancies, both quantitative and qualitative findings converge on the importance of prioritizing practical skills and fostering cultural understanding in maritime education and training. Suggestions for improvement include implementing clearer guidelines and fostering open communication.

The implications of these findings could potentially influence real-world practices within the maritime industry. Addressing these challenges may help stakeholders improve intercultural efficiency, reduce conflicts, and enhance safety, efficiency, and collaboration at sea. This approach, which combines quantitative data with qualitative insights, aims to offer a comprehensive understanding of the research topic and inform strategies for positive change within the maritime community.

The study offers insights into factors that may influence the performance of management-level crew members and provides recommendations for enhancing educational curricula at MET institutions to address these challenges. By emphasizing the importance of cultural competence, communication skills, and experiential learning opportunities, the research seeks to contribute to advancing knowledge in the field of maritime education and training.

5.1 Summary of objectives

In the course of this thesis, the objective has been to investigate methods for enhancing the performance of management-level crew within the maritime industry by refining the educational syllabi offered at Maritime Education and Training (MET) institutions. The primary focus revolved around addressing several key research questions. Firstly, the study aimed to assess the extent to which teaching intercultural competence and communication capabilities was integrated into the educational syllabi at MET institutions.

Additionally, it sought to identify the most prevalent cultural challenges faced by seafarers on board seagoing vessels, along with the prominent communication barriers they encountered. Furthermore, the research endeavoured to find effective strategies that management-level crewmembers aboard seagoing vessels could employ to improve seafarers' intercultural competence and communication capabilities.

By addressing these questions, the thesis aimed to contribute insights that could inform the development of tailored educational programs aimed at enhancing the performance and effectiveness of maritime personnel in diverse cultural and communicative contexts.

5.2 Discussion

The findings of this study could contribute to advancing knowledge in the field of maritime education and training by addressing the research questions. Identifying possible gaps in teaching intercultural competence and communication capabilities within the educational curricula at Maritime Education and Training (MET) institutions highlights areas for potential improvement. Although this thesis did not include a detailed comparison of existing curricula, it aimed to point out insufficiencies based on participant insights and literature review. By recognizing these areas, educators and legislators might prioritize integrating intercultural communication skills and cultural awareness training into maritime education programs. This aligns with the thesis's objective to enhance the performance of management-level crew members by refining the educational syllabus.

Moreover, the insights gained regarding the cultural challenges faced by seafarers on board seagoing vessels offer valuable guidance for addressing cultural diversity in maritime operations. Understanding these challenges allows for the implementation of targeted interventions, such as cross-cultural training initiatives, to equip maritime personnel with the necessary skills to navigate diverse cultural contexts effectively.

Nevertheless, the discrepancies observed between the quantitative and qualitative findings highlight the inherent complexity of the issues under investigation. While quantitative data may provide numerical insights into the prevalence of certain challenges, qualitative data offer deeper insights into the underlying reasons and nuances associated with these challenges. It is important to acknowledge that such discrepancies are a normal aspect of mixed-methods research, as qualitative data are often derived from purposive sampling of a smaller, more focused group, which can lead to different perspectives compared to the broader quantitative survey results. For instance, while quantitative analysis may reveal a lack of formal communication training, qualitative analysis may uncover specific cultural barriers or communication breakdowns experienced by seafarers in real-world scenarios. These differences underscore the complementary nature of quantitative and qualitative research methodologies, each contributing unique insights to provide a comprehensive understanding of complex phenomena.

Furthermore, there is a notable difference in the way the research questions are perceived through these methodologies. For the research questions, "What are the most prominent cultural challenges faced by seafarers on-board of seagoing vessels?" and "What are the most prominent barriers to communication that seafarers on-board of seagoing vessels tend to struggle with?", the quantitative findings suggest that participants generally disagree with statements about multicultural teams facing culture clashes, the inadequacy of teaching materials for intercultural competence, and the significant challenges posed by limited cultural comprehension and interpreting other cultures' expressions. Similarly, they disagree with notions about language competency

creating misunderstandings, the inability to speak a common language causing issues between vessels, and insufficient training in understanding non-verbal communication.

Conversely, the qualitative findings from interviews indicate that seafarers often encounter cultural challenges related to communication and understanding, with variations in language, expressions, and customs sometimes leading to misunderstandings and difficulties. The presence of multiple cultural identities among crew members adds complexity to interactions, suggesting a need for improved cultural awareness and competence. Additionally, communication challenges are noted to stem from language barriers and varying levels of linguistic proficiency, complicating message interpretation and effective collaboration.

These contrasting findings imply that while quantitative data might downplay the prevalence of cultural and communication issues, qualitative data reveals underlying challenges and the need for enhanced intercultural competence and communication skills. This integrated approach provides a more nuanced understanding, informing actionable strategies to address the identified gaps and improve maritime education and training programs.

Overall, by synthesizing quantitative and qualitative findings, this study aims to offer insights into the challenges faced by management-level crew members in the maritime industry and proposes recommendations for enhancing intercultural competence and communication capabilities in maritime education and training programs.

5.3 Conclusions

5.3.1 Research question 1

To what extent is the course of intercultural competence integrated into the educational curriculum at Maritime Education and Training (MET) institutions?

The findings suggest significant inadequacies in the current state of the curriculum regarding the inclusion of teaching intercultural competence in Maritime Education and Training (MET) institutions.

Respondents indicated a low level of integration of intercultural training, awareness, and curricula within MET institutions' educational programs. Specifically, they highlighted that current standard curriculum tend to focus heavily on technical skills while neglecting the development of intercultural competence and communication skills. Many respondents noted the absence of dedicated courses on intercultural communication, and those that did exist were often brief and lacked depth. Furthermore, there was a general consensus that training materials did not adequately address cultural diversity and the unique challenges it poses in maritime settings. This feedback underscores the need for a more comprehensive approach to integrating intercultural training into MET programs.

This deficiency can be attributed to various barriers, including a lack of emphasis on creating a diverse and multicultural learning environment. One major barrier is the insufficient inclusion of intercultural competence and communication training in the current curricula. Many MET institutions prioritize technical skills and knowledge, often overlooking the importance of cultural awareness and communication skills necessary for a global maritime workforce.

Another barrier is the limited exposure of students to diverse cultures within the educational setting. This can be due to homogenous student populations and a lack of opportunities for interaction with individuals from different cultural backgrounds. Additionally, there is often a lack of training and resources for educators to effectively teach intercultural competence.

To overcome these barriers, MET institutions can take several steps. First, they can revise their curricula to include comprehensive courses on intercultural communication and cultural awareness. This includes incorporating case studies, simulations, and real-life scenarios that highlight cultural diversity and its impact on maritime operations.

Second, institutions can foster a multicultural learning environment by promoting diversity among students and staff. This can be achieved through international exchange

programs, collaborations with maritime institutions in different countries, and recruiting students from diverse backgrounds.

Third, providing professional development for educators on intercultural competence and teaching strategies can equip them with the necessary skills to address cultural differences effectively.

By addressing these barriers and implementing these strategies, MET institutions can create a more inclusive and multicultural learning environment, ultimately enhancing the intercultural competence of future seafarers.

Additionally, while MET institutions offer some training materials and courses, these often lack sufficient content addressing interactions with individuals from diverse cultural backgrounds. Studies such as Ai-Ju (2012), Guo-Bing (2009) and Al-Issa (2004) suggest that cultural conflicts are inherent to human interactions, highlighting the importance of customized teaching. Furthermore, the focus on theoretical learning in MET curricula, rather than practical application, contributes to the limited development of students' intercultural competencies. Overall, these findings underscore the need for MET institutions to enhance their educational programs to better prepare students for interactions in multicultural maritime environments.

5.3.2 Research question 2

To what extent is the teaching of communication skills emphasized within the academic framework of Maritime Education and Training (MET) institutions?

The findings regarding the inclusion of teaching communication skills in the educational syllabus at Maritime Education and Training (MET) institutions revealed significant shortcomings.

Respondents indicated low scores, highlighting deficiencies in MET curricula's ability to bridge cultural gaps effectively. Beyond language barriers, the concept of intercultural differences encompasses complex facets such as attitudes, norms, traditions, and entities, which are insufficiently addressed in current teaching materials. Cultural behavioural patterns, as identified in previous studies, play a crucial role in transmitting human values and approaches, yet MET institutions struggle to incorporate these into their curricula and social interactions. Specifically, dimensions within the communication capabilities axis, including Communication programs and Intercultural Communication all received low scores.

This deficiency in Communication programs suggests a lack of practical training programs to apply theoretical concepts in real-world situations globally. Similarly, the inadequacy in

intercultural communication training material hinders students' abilities to communicate effectively with peers from diverse backgrounds using face-to-face strategies. Furthermore, the focus on graded tests and quantitative aspects of academic achievements overlooks the importance of linguistic and multicultural skills necessary for students' overall learning experience in the maritime domain. This observation stems from the emphasis within Maritime Education and Training (MET) institutions on technical skills and examination-based assessments, rather than providing comprehensive instruction in linguistic and multicultural competencies. This issue was discussed in detail in Chapter 2, which explored the landscape of maritime education.

These findings underscore the urgent need for MET institutions to revamp their educational programs to better equip students with communication skills essential for navigating multicultural maritime environments effectively. A critical component of this revamp should include the enhancement of Maritime English courses.

Maritime English courses play a pivotal role in this context as they provide the foundational language skills necessary for clear and effective communication among multinational crews. These courses should not only focus on technical vocabulary and standard maritime communication phrases but also integrate elements of intercultural communication. This means incorporating training on how language use can vary across cultures, the importance of non-verbal cues, and strategies for overcoming language barriers and misunderstandings.

By combining robust Maritime English training with comprehensive intercultural communication education, MET institutions can ensure that future seafarers are well-prepared to work in diverse and multicultural settings. This dual focus will help them develop not only the linguistic proficiency required for safe and efficient operations but also the cultural sensitivity and adaptability needed to foster positive and productive interactions on board.

5.3.3 Research question 3

What are the predominant cultural hurdles and communication barriers faced by seafarers aboard seagoing vessels?

The findings regarding the most prominent cultural challenges faced by seafarers on board seagoing vessels highlighted several significant barriers.

Language emerged as a primary concern, as effective communication on board and within Maritime Education and Training (MET) institutions relies heavily on proficiency in English, which is the lingua franca of the maritime industry. Language barriers,

particularly a lack of proficiency in Maritime English, often result in ineffective communication, exacerbating cultural challenges.

Proficiency in Maritime English encompasses not only the ability to understand and use technical vocabulary and standard communication phrases but also the capacity to engage in everyday conversations and handle complex, non-routine situations. The lack of such proficiency can lead to misunderstandings, errors in following instructions, and difficulties in crisis management, all of which are critical in a multicultural and high-stakes environment like a ship.

Therefore, enhancing Maritime English training within MET institutions is crucial. This should involve not just teaching the language itself but also incorporating intercultural communication skills, which help seafarers navigate the nuances of language use across different cultures, thus ensuring more effective and harmonious interactions on board.

The third axis, cultural challenges, encompassing cultural, linguistic, and learning challenges, received high scores, indicating the prevalence of these issues. These findings align with previous studies, such as Daley (2020), which underscored the communication-related challenges stemming from cultural diversity. For instance, mariners from different cultural backgrounds may struggle to communicate effectively due to differences in communication styles, tones of voice, phrase lengths, and body language. Additionally, language barriers, particularly a lack of proficiency in Maritime English, can further hinder effective communication among crew members. Such differences can lead to misunderstandings and tensions among crew members, highlighting the impact of cultural behaviours on communication dynamics.

Overall, the findings emphasize the need for strategies to address these cultural challenges and promote effective communication among seafarers from diverse backgrounds.

5.3.4 Research question 4

What challenges do educators and students encounter in teaching and learning intercultural communication and competence at Maritime Education and Training institutions?

The findings regarding the most prominent barriers to communication that seafarers on board seagoing vessels tend to struggle with highlight several significant challenges. Linguistic barriers emerged as a primary concern, as the lack of linguistic competencies among seafarers often leads to difficulties in communication. This includes the inability to understand culturally-related gestures and visual communication tools, obstructing effective communication paths. Studies by Covele, Langa & Swanzy (2022) and Li S. (2019)

reinforce this notion, emphasizing how language barriers hinder communication and may lead to prejudice against other communities. Additionally, learning-related barriers, such as the lack of sufficient courses and training programs to enhance communication skills and understand cultural cues, were identified as significant challenges. Furthermore, the absence of adequate evaluation tools to assess students' communication skills and multicultural awareness levels exacerbates these challenges. These findings underscore the critical importance of addressing linguistic and learning barriers to improve communication among seafarers from diverse backgrounds and enhance their overall performance in the maritime industry.

The responses from interviews shed light on various inhibitors of cultural and communication understanding on board seagoing vessels. Participants highlighted concerns regarding the insufficient emphasis on teaching cultural diversity and practical communication skills in maritime education. Participant feedback underscored the existence of gaps in understanding among crew members due to overlooking cultural diversity in education and the focus on theoretical knowledge rather than essential practical skills. Weaknesses in training courses related to cultural diversity and communication were also noted, suggesting a gap in the curriculum hindering students' ability to navigate diverse maritime environments successfully.

Moreover, participants stressed the importance of prioritizing practical application over exam-oriented content and integrating cultural diversity into maritime education curricula. Analogies such as likening the importance of emphasizing cultural diversity to sunscreen on a sunny day underscored its critical role in preventing cultural misunderstandings. The necessity of welcoming cultural diversity into the heart of maritime education was also emphasized.

These insights provide compelling arguments for addressing the inhibitors of cultural and communication understanding on board seagoing vessels. They underscore the need for educational institutions to prioritize practical communication skills and cultural diversity in their curricula, equipping students with the necessary tools to navigate diverse maritime environments effectively. Additionally, they advocate for a shift towards innovative teaching methods to meet the evolving needs of maritime education and better prepare students for the challenges they will encounter in their careers.

5.3.5 Research question 5

What most effective strategies can maritime organizations employ to enhance the intercultural proficiency of their crew members and alleviate intercultural discord?

Several strategies emerged from the study to enhance the intercultural proficiency of crew members and alleviate intercultural discord aboard seagoing vessels. These

strategies include establishing ground rules and fostering a culture of mutual respect among crew members to promote harmony on board. Adhering to international standards in personnel selection ensures recruitment of culturally aware individuals capable of managing intercultural challenges effectively. Implementing training programs aimed at promoting multilingualism and embracing diverse identities within maritime crews can bridge cultural gaps and foster inclusivity. Providing exposure to realistic situations enables crew members to apply their knowledge and skills in practical scenarios, better preparing them for challenges at sea. Addressing communication challenges through promoting open communication, conflict resolution training, and establishing clear protocols for conflict resolution is crucial. Additionally, establishing guidelines and requirements for the crew ensures consistency and efficiency in operations. Finally, training proficiency in multiple languages and embracing human diversity enhances communication skills and fosters a more inclusive environment among crew members. Overall, these strategies highlight proactive measures necessary to promote cultural understanding, effective communication, and conflict resolution on board seagoing vessels, ultimately contributing to safer and more efficient operations at sea.

Overall, by synthesizing quantitative and qualitative findings, this study offers valuable insights into the challenges faced by management-level crew members in the maritime industry and proposes actionable recommendations for enhancing intercultural competence and communication capabilities in maritime education and training programs.

5.3.6 Summary

This study employed a mixed-methods approach, integrating quantitative data analysis, qualitative interviews, and a comprehensive literature review to explore the integration of Intercultural Competence and Communication Management (ICCM) within Maritime Education and Training (MET) institutions. The findings from this multifaceted research reveal critical insights into the current state of ICCM in MET curricula and offer actionable recommendations for improvement.

1. Integration of ICCM in MET Curricula

Findings: the research indicates significant shortcomings in the integration of ICCM into MET curricula. Quantitative analysis revealed that ICCM training is inadequately represented in MET programs, focusing primarily on technical skills at the expense of intercultural and communication competencies (Li W. , 2011). Qualitative feedback and the literature review further highlighted that MET curricula often lack comprehensive ICCM training, with most programs only offering brief and superficial courses on cultural diversity (Daley, 2020). This focus on technical expertise over ICCM reflects a broader trend in maritime education where cultural and communication skills are undervalued (Al-Issa, 2005).

Recommendations: to address these shortcomings, MET institutions should overhaul their curricula to integrate robust ICCM training. This includes developing detailed ICCM courses that incorporate case studies, simulations, and real-life scenarios to prepare students for the diverse challenges of the maritime industry (Campion et al., 1988). Institutions should also promote a multicultural learning environment through international exchanges and diverse recruitment strategies to broaden students' cultural experiences (Li-sheng, 2000).

2. Emphasis on Communication Skills in MET Academic Frameworks

Findings: the study uncovered significant deficiencies in the emphasis on communication skills within MET academic frameworks. Quantitative data and qualitative interviews revealed that MET curricula are weak in addressing the complex facets of intercultural communication, such as attitudes, norms, and cultural behaviours (Campion et al., 1988). The literature review confirmed that MET programs emphasize technical skills and examination-based assessments over practical communication training (Daley, 2020).

Recommendations: to enhance communication skills, MET programs should not only expand their Maritime English courses but also integrate methodologies like Intercomprehension to develop plurilingual competencies. While language proficiency remains crucial, training should also include elements of intercultural communication and strategies for effective communication in diverse maritime contexts (Al-Issa, 2004). By incorporating Intercomprehension approaches, MET programs can foster an

understanding of related languages and cultural nuances, which better equips students for effective communication in multinational crews and complex maritime environments (Li-sheng, 2000); (Lungu & Cizer, 2013)).

3. Cultural and Communication Barriers Faced by Seafarers

Findings: the study identified language barriers and cultural differences as primary challenges for seafarers. Quantitative data highlighted that inadequate Maritime English proficiency hinders effective communication, while qualitative data revealed how cultural misunderstandings and communication breakdowns exacerbate these challenges (Daley, 2020). The literature underscores that effective communication in maritime settings requires more than just language skills; it also requires an understanding of cultural nuances and interpersonal dynamics (Al-Issa, 2005).

Recommendations: MET institutions should strengthen their Maritime English training programs and integrate comprehensive intercultural communication training. This approach should include practical exercises and strategies for overcoming language barriers and understanding cultural differences (Ilie, 2019). These improvements will enhance seafarers' ability to manage multicultural teams and navigate complex maritime situations (Daley, 2020).

4. Challenges in Teaching and Learning ICCM in MET Institutions

Findings: the study revealed several challenges in teaching and learning ICCM, including inadequate training resources, ineffective evaluation methods, and an overemphasis on theoretical knowledge rather than practical application (Alsaawi, 2014). Both qualitative insights and literature review supported these findings, indicating that MET programs need more practical and application-focused ICCM training (Campion et al., 1988).

Recommendations: MET institutions should develop practical ICCM training programs and provide professional development for educators. This includes creating effective evaluation methods and incorporating practical exercises into the curriculum to better prepare students for diverse maritime environments (Liu M. , 2016). These steps will help educators teach ICCM more effectively and address the challenges of a multicultural maritime workforce (Daley, 2020).

5. Effective Strategies for Enhancing Intercultural Proficiency

Findings: the study identified several effective strategies for enhancing intercultural proficiency among seafarers. These strategies include establishing ground rules for mutual respect, adhering to international standards in recruitment, and implementing training programs that promote multilingualism and cultural diversity (Liu M. , 2016). Both quantitative and qualitative data, along with literature insights, support these strategies for addressing intercultural challenges (Campion et al., 1988).

Recommendations: maritime organizations should adopt these strategies to foster a culture of respect and inclusivity. This involves promoting open communication, providing conflict resolution training, and establishing guidelines for effective intercultural interactions (Daley, 2020). By implementing these strategies, maritime organizations can create a more inclusive and effective working environment for diverse crews (Al-Issa, 2005).

Overall Summary

Based on the data collected from quantitative analyses, qualitative interviews, and the literature review, this study finds that MET programs exhibit significant gaps in the teaching of ICCM. The research highlights the need for a comprehensive redesign of MET curricula to better prepare students for the complexities of intercultural and communication challenges in the maritime industry. The study's mixed-methods approach has provided a detailed understanding of these issues and offers concrete recommendations for improving ICCM in maritime education.

5.4 Limitations

For a comprehensive view of the study's findings and to increase its credibility, it is essential that research limitations be acknowledged. In education for example, lack of comparative studies was pointed out as a major limitation by Khakpour (2012). Similarly, in social development research, researcher bias risks and the significance of gender asymmetry considerations according to Patnaik (2018) are important limitations. Taken together these studies emphasise the necessity for transparency and consistency when addressing research limitations (Khakpour, 2012).

The study had functional limitations with respect to the period which had a temporal constraint from 2019 to 2023 across all research segments. Within emerging economic and social contexts, Venkatesh et al. (2021) call for a greater focus on time in information system research.

Additionally, the absence of comparison among MET institutions offering intercultural training is noteworthy. While conducting such a comparison could have provided valuable insights, it was not the primary focus of this study. The main objective was to assess the current state of intercultural training within MET institutions and identify areas for improvement. Delving into comparative analyses would have extended the scope beyond the intended research goals and could have introduced complexities that might have overshadowed the primary findings. Therefore, while acknowledging the potential value of such comparisons, they were not pursued in this study to maintain focus and clarity in addressing the primary research questions. Although this may bring bias and hinder a holistic comprehension of intercultural training courses, cooperation between MET of different cultural viewpoints is important in unifying syllabuses.

Furthermore, a limitation of this study is the discrepancy observed between the qualitative and quantitative findings regarding cultural and communication challenges. While quantitative data suggests that participants generally do not perceive significant issues with multicultural team dynamics or language barriers, qualitative insights reveal underlying challenges and the need for better cultural awareness and communication skills. This discrepancy indicates a need for future close-up research to further investigate and clarify these differences, potentially uncovering deeper insights into the complexities of intercultural interactions and communication within the maritime industry.

Despite the limitations in the study, I acknowledge potential sources of bias or error that could impact the validity and generalizability of the findings. Firstly, the sampling method utilized to select participants may introduce bias, particularly if it fails to adequately represent the diversity of the maritime community. To mitigate this, the study aimed to balance the representation of participants based on their levels of experience in the maritime industry by including both seasoned professionals and emerging maritime

students. This approach was intended to capture a wide range of experiences and opinions, ensuring that the study included both practical operational perspectives from experienced seafarers and academic insights from students at different stages in their maritime careers. However, despite these efforts, the sampling method's limitations, such as focusing solely on German participants gathered based on self-selection, could still impact the study's ability to represent the full spectrum of the maritime community.

Moreover, self-selection bias could occur if participants who choose to take part in the study have unique perspectives or experiences that differ from those who opt out. This could lead to skewed results and limit the generalizability of the findings to a broader population of seafarers.

Furthermore, the possibility of social desirability bias cannot be ignored, as participants may feel compelled to provide responses they perceive as more socially acceptable or favourable, rather than reflecting their true beliefs or experiences. This could potentially overestimate agreement on certain issues or lead to underreporting of sensitive topics, affecting the validity of the findings.

Additionally, response bias may arise if participants interpret survey questions differently or provide inaccurate responses due to misunderstanding or lack of clarity in the survey instrument. This could introduce measurement error and compromise the validity of the data collected.

Lastly, researcher bias may impact the interpretation of findings if my own perspectives or preconceptions influence the analysis and conclusions drawn from the data. Despite these potential limitations, the results of the study still provide valuable insights and valid answers to my research question regarding elevating the performance of management-level crew through the enrichment of the educational curriculum at Maritime Education and Training (MET) institutions. It is important to acknowledge these limitations transparently and consider them in the interpretation of the findings while recognizing the significance of the study's contributions to the field.

5.5 Recommendations

In this section, I present recommendations tailored to address key areas identified in the study, encompassing future research directions, the development of a concept draft for teaching intercultural communication and competence at maritime universities, and delineating major tasks and qualities for institutions, teachers, and students in ICC courses. My aim is to inform stakeholders and guide initiatives toward fostering a more culturally competent and communicatively proficient maritime workforce. Through these recommendations, I aspire to contribute to the advancement of educational practices in the maritime industry, ensuring that management-level crew members are equipped with the necessary skills to thrive in diverse maritime environments.

5.5.1 Future studies recommendations

For the first recommendation sector, I suggest the following research inquiries:

5.5.1.1 Professional, functional, and environmental challenges faced by seafarers and their impact on communication and linguistic skills

Rationale:

This research would seek to explore the various challenges faced by seafarers in their professional roles, the functional difficulties encountered during their duties, and the environmental factors that influence their work. By understanding these challenges, the research seeks to examine how these contribute to understanding the communicative and linguistic needs of seafarers.

Approach:

The study would employ a mixed-methods approach, combining qualitative interviews with seafarers and quantitative surveys to gather data. Professional challenges refer to obstacles related to their specific roles and responsibilities on board ships, such as managing crew dynamics or complying with maritime regulations. Functional challenges encompass difficulties encountered during daily tasks, such as using specialized equipment or adapting to changing weather conditions. Environmental challenges pertain to factors outside of the seafarers' control, such as rough seas, extreme weather, or long periods away from home. These methods would help identify the most common challenges, both within and outside their professional roles, and their implications on communication and linguistic proficiency.

5.5.1.2 *The correlation between maritime education and training (MET) institutions and students' intercultural skills*

Rationale:

This research would explore the link between the quality of education and training provided by MET institutions and the intercultural skills of their graduates. It aims to determine how the curriculum, teaching methods, and institutional practices impact students' ability to navigate intercultural contexts effectively within the maritime industry.

Approach:

The study would employ comparative analysis of MET institutions with varying approaches and curricula. It would assess students' intercultural competence through surveys, intercultural assessments, and feedback from industry professionals. The research would identify best practices in MET institutions that produce graduates with superior intercultural skills.

5.5.1.3 *Comparative analysis of intercultural competence in seafarers across global regions*

Rationale:

This research would aim to conduct a rigorous comparative analysis of intercultural competence among seafarers originating from varied global regions. It is grounded in the understanding that culture, language, and context play pivotal roles in shaping the intercultural skills and communication effectiveness of seafarers. This study would seek to examine how these disparities influence the communication dynamics and overall effectiveness of multicultural crews on seagoing vessels.

Approach:

The research would entail an expansive cross-regional investigation, which may include surveys, interviews, and intercultural assessments. Data collection would be stratified to capture regional, linguistic, and cultural variations. Statistical analyses and qualitative interpretation would be employed to identify patterns, discrepancies, and factors influencing intercultural competence across different seafaring communities. Through this approach, the research would offer valuable insights into the interplay of culture and communication in maritime settings.

5.5.2 ICC concept recommendation in maritime education

I suggest developing a preliminary concept for teaching ICC at maritime universities to align with the evolving industry demands and to equip management-level crew members with essential intercultural communication competence (ICC) skills. This recommendation emphasizes the creation of customized pedagogical frameworks for maritime education, utilizing innovative approaches to effectively teach ICC skills. By outlining a roadmap for conceptualization and potential implementation, the aim is to contribute to fostering a culturally competent and communicatively proficient maritime workforce.

5.5.2.1 Course objectives

The following proposed course material strives to achieve a number of objectives at the final stage of students' educational phase. Such objectives can be outlined as follows:

- Assist MET institutions in offering more practical courses that support their main theoretical educational construct.
- Raise levels of cultural awareness amongst students, and direct them to integrate communication skills, that are reinforced with intercultural competencies, into their professional practices.
- Develop the resilience of students' linguistic skills, and teach them how to communicate with their colleagues and crewmembers regardless of the languages that they use.
- Encourage students to respect the values of cultural diversity, and cooperate with their colleagues and crewmembers accordingly.
- Foster alignment between students' verbal and non-verbal communication skills
- Teach and train seafarers to activate experience accumulated from their MET education phase, into real-life situations.
- Garner high levels of respect amongst seafarers on board seagoing vessels.
- Transform conceptual models and theoretical frameworks into real-life practical endeavours through which seafarers can enhance their intercultural competencies.
- Enhance the overall sense of harmony between seafarers on board seagoing vessels.
- Teach and train seafarers to create customized cultural frameworks that help them cooperate effectively in various contexts that define their own unique environments.

5.5.2.2 Course outline

The following outline elucidates a number of specific implementation and evaluation strategies that are entailed by each module within the proposed course. Accordingly, these modules can be explained in detail as follows:

Module No. 1: Intercultural Communication in the Maritime Industry

The first module identifies the manner through which students are introduced to understanding the essence of cultural diversity, and learning about cultural and intercultural communication within several professional maritime-based contexts. Consequently, the module includes the following educational and practical strategies:

Table 13: Module No1: Intercultural communication in the Maritime Industry

Educational Strategies	Practical Strategies
Defining the meaning of culture	Organizing field trips to different communities in society
Explaining the meaning of diversity across various cultures	Creating role-play activities where students place themselves in various cultural positions
Understanding the nature of the maritime industry	Inviting captains and experienced seafarers to manage students understanding of communication
Introducing a comprehensive framework for seafarers' life on board seagoing vessels	Initiating field trips to seagoing vessels
Comprehending the aspects of intercultural communication and competencies in the maritime industry	Establishing collaborative workshops with other students from different MET institutions

Module No. 2: Cultural Readiness

The second module identifies the manner through which students can enhance their levels of cultural awareness and become more sensitive to other cultural backgrounds and gain a high sense of courtesy when they interact and cooperate with their colleagues and crewmembers so that they do not offend their cultures or disrespect their customs and/or traditions by mistake. Consequently, the module is inclusive of the following educational and practical strategies:

Table 14: Module No2: Cultural Readiness

Educational Strategies	Practical Strategies
Teaching the differences between cultures across the globe	Participating in cultural symposiums and conferences
Enhancing levels of empathy and respect towards varying cultural backgrounds	Attending festivals that are organized by various cultural communities
Integrating the dimensions of cultural awareness with communication skills	Conduct workshops that focus on specific cultural dimensions, such as language, customs, and etiquette
Mitigating aspects of prejudice and stereotypes amongst students	Organize workshops that focus on diversity and inclusion. These workshops can bring in guest speakers, engage in open discussions, and provide a platform for students to share their experiences and perspectives.

Module No. 3: Multifaceted Essence of Communication

The third module identifies the manner through which students get to learn about and practice various communication skills and activities, in order to overcome any communication barriers once they become responsible for conducting various maritime activities that require high levels of cooperation with their fellow seafarers. Consequently, the module is inclusive of the following educational and practical strategies:

Table 15: Module No3: Multifaceted Essence of Communication

Educational Strategies	Practical Strategies
Teaching students' various languages	Using AI-assisted applications to create several scenarios that require the use of different languages
Presenting different cultural non-verbal communication	Encouraging students to interact with other individuals who belong to varying cultural backgrounds in a non-verbal manner
Understanding the most prominent social and cultural cues	Present case studies highlighting real-life situations of misunderstandings due to cultural cues. Discuss the outcomes and how better cultural understanding could have averted the issues.
Learning the values of interchangeable reciprocation within professional contexts	Prompting students, who belong to varying cultural backgrounds, to create projects together

Module No. 4: Conflict Management

The fourth module explores how students can resolve conflicts that may arise during communication and collaboration with their crewmates. These conflicts might stem from miscommunication or cultural misunderstandings. Consequently, the module includes the following educational and practical strategies:

Table 16: Module No 4: Conflict Management

Educational Strategies	Practical Strategies
Outlining possible precursors to conflict	Attending workshops and symposiums
Exhibiting examples of on board conflict and ways to overcome them	Organizing active learning (e.g., role-plays) that place students in contexts where they are challenged by a conflict
Presenting different activities of conflict resolution	Organizing role-play activities that place students in contexts where they are challenged by conflict
Teaching students various negotiating and mediation skills	Organizing negotiation simulations or role-play scenarios where students engage in real-life negotiation situations. Provide feedback and guidance to help them understand the negotiation process and develop effective skills.

Module No 5: Personal Interest Development

The fifth module identifies the manner through which students learn the extent to which it is appropriate that their personal interests should be overlooked in favour of the overall and collective interest of the crew on board seagoing vessels, by teaching them how to cooperate together and work as one entity. Consequently, the module includes the following educational and practical strategies:

Table 17: Module No5: Personal Interest Development

Educational Strategies	Practical Strategies
Introducing several scenarios that highlight the significance of partnership	Prompting students to create project-based activities together
Illustrating proficient communication techniques and personal management strategies within the context of a hierarchical organizational structure on maritime vessels	Use real-life case studies from maritime incidents or success stories where communication and personal management played a crucial role. Analyse these cases in class, encouraging students to identify effective strategies and lessons learned. This approach provides practical insights and helps students connect theory to real-world applications.
Teaching students how to develop their intercultural competencies	Assign group projects that require collaboration among students from diverse cultural backgrounds. Encourage them to work together on tasks that involve problem-solving, critical thinking, and creative projects. This practical experience fosters cooperation and helps students develop their intercultural skills.

Module No 6: Integration and Practices

The sixth module identifies the manner through which students can integrate all the previously taught and practiced modules within real-life situations and contexts. Consequently, the module is inclusive of the following educational and practical strategies:

Table 18: Module No6: Integration and Practices

Educational Strategies	Practical Strategies
Teaching students how to integrate linguistic skills with communication skills	Assign oral presentation projects that require students to not only convey information but also engage their audience effectively. Emphasize the use of language abilities, such as clear articulation and vocabulary choice, in conjunction with non-verbal communication, such as body language and eye contact.
Teaching students to merge their strands of knowledge and apply them in a sustainable manner	Organizing field trips that last for a number of weeks where students get to live with each other on board a seagoing vessel
Teaching students to utilize their intercultural competencies in real life	Organizing field trips that last for a number of weeks where students from varying cultural backgrounds get to stay and collaborate together

5.5.3 Summary

The recommendations outlined in the preceding sections follow from my own findings, teaching experiences, research endeavours, and active involvement in the maritime sector. They serve as an initial framework aimed at advancing the teaching of intercultural communication and competence at Maritime Education and Training institutions (MET). While these recommendations could provide a solid starting point, I recognize the need for further extensive research and testing to validate and refine these concepts into standardized training practices.

Given the diverse cultural, linguistic, and habitual nuances inherent in the maritime industry, Future studies in maritime education can benefit from exploring broader contexts to establish universally accepted training protocols. Recent initiatives by the International Maritime Organization (IMO) aimed at updating the Standards of Training, Certification, and Watchkeeping (STCW) convention to include soft skills, such as intercultural communication competencies, are worth noting. The integration of intercultural communication (ICC) courses in maritime curricula is a crucial but challenging task, as highlighted by Ungureanu (2014) and Simanjuntak et al. (2023). The need for such courses is underscored by the multicultural crew dynamics and global nature of the maritime industry. However, the tension between core competencies and specialized knowledge, as noted by the query, can hinder the effective integration of ICC courses. This tension is further complicated by the need for continuous curriculum development and practical applications, as emphasized by Simanjuntak et al. (2023). To address these challenges, pedagogical innovations and methods for developing intercultural competence, such as those proposed by Yusof et al. (2017) and Kondratiev et al. (2016), are essential. These studies underscore the importance of a holistic and responsive approach to curriculum development, as well as the need for practical and real-life applications of ICC skills.

Furthermore, it's important to acknowledge the challenges within maritime curricula, which often prioritize STCW competencies over specialized academic skills. This balance between core competencies and specialized knowledge, such as those attained in Bachelor's or Master's programs in Nautical Sciences or Marine Engineering, can influence the integration of comprehensive intercultural communication (ICC) courses. The International Maritime Organization (IMO) has actively revised the STCW convention to adapt to changes in the maritime industry. Scholars like Bârsan et al. (2007) emphasize the necessity for updated competencies and the implementation and monitoring of these standards. Trenkner and Cole (2012) highlight the impact of the STCW Manila Amendments on Maritime English, focusing on language and communication skills. Beckett et al. (2014) suggest using simulation in mandatory STCW short course programs to assess competence, particularly in emergency scenarios. These efforts collectively underscore the IMO's commitment to modernizing the STCW convention, including integrating soft skills such as intercultural communication competencies.

A comprehensive ICC course could play a vital role in bridging gaps in communication and cultural understanding within the maritime industry. However, it's essential to address where such a course fits within existing curricula. This involves considering logistical challenges, ensuring alignment with core competencies mandated by the STCW, and finding a balance between general soft skills training and specialized academic pursuits. By navigating these complexities, maritime education can better prepare seafarers to navigate the diverse cultural, linguistic, and habitual nuances of the industry.

5.6 Closing Remarks

In conclusion, this study sheds light on essential aspects of intercultural communication and competence within the maritime industry. The findings underscore the significance of addressing these factors to enhance the performance of management-level crew members effectively. As we reflect on the implications of this research, it becomes evident that prioritizing intercultural competence in maritime education is imperative for navigating the complexities of today's globalized maritime environment.

I extend my sincere appreciation to all participants, institutions, and stakeholders who graciously contributed to this research endeavour. Their invaluable insights and collaboration have been instrumental in shaping the findings and recommendations presented in this study.

Moving forward, it is crucial to heed the recommendations proposed herein and work collectively towards integrating intercultural communication skills into maritime education and training programs. By doing so, we can ensure that future maritime professionals are well-equipped to thrive in diverse and dynamic maritime settings.

I remain hopeful that this study will serve as a catalyst for positive change within the maritime industry, fostering a culture of inclusivity, collaboration, and excellence. Thank you to everyone involved for their unwavering support and dedication to advancing maritime education and training.

Annex 1 Survey statements

Part 1: Demographic Variables

- **Gender**
 - Male
 - Female
- **Age**
 - Less than 30 years
 - From 30 years to less than 40 years
 - From 40 years to less than 50 years
 - 50 years and above
- **How long have you served at sea?**
 - Less than 5 years
 - From 5 to less than 10 years
 - 10 years and above
- **Previous training courses on Intercultural**
 - Less than 3 courses
 - From 3 to 5 courses
 - More than 5 courses
 - None

Part 2: Statements, Axis and Dimensions

- **The First Axis: Teaching intercultural competence**
 - **The First Dimension: Intercultural training**
 - A1: Cross-cultural training is essential to improve seafarers' intercultural competence.
 - A2: Intercultural training can enhance work adjustment to intercultural contexts.
 - A3: Cross-cultural training provides students and seafarers with realistic expectations about the new on board life.
 - A4: Cross-cultural training reduces the stress and ambiguity that seafarers can experience on board.
 - **The Second Dimension: Intercultural awareness**
 - A5: Intercultural awareness is essential for interactions between different cultures.
 - A6: Cultivating sensitivity to managing cultural differences is essential in a global workplace.
 - A7: Students must understand that coexistence with other peoples' cultures is essential for cross-cultural interaction.
 - A8: Intercultural awareness training programs are essential for enhancing the interpersonal skills of future seamen.
 - **The Third Dimension: Intercultural curricula**
 - A9: MET institutions should focus on preparing interculturally competent professionals through intercultural curricula.
 - A10: Intercultural curricula should cover the ability to learn and understand cultural awareness.
 - A11: Language competencies should be enhanced in intercultural curricula.
 - A12: Curricula must concentrate on increasing cross-cultural understanding and others' acceptance.

- **The Second Axis: Teaching communication competences**

- **The First Dimension: Communication programs**

- A13: Communication programs should help students recognize commonalities and differences among cultures.
- A14: Improving crew communication through training and education is essential for reducing the risk of cultural shock.
- A15: Leadership on board should enhance cross-cultural competency to overcome cultural differences in the intercultural team.
- A16: Intercultural communication enables students to understand values and beliefs beyond behaviours.

- **The Second Dimension: Inter-cultural Communication**

- A17: Intercultural dialogue encourages a peaceful and sustainable environment on board.
- A18: Intercultural dialogue enhances the interpersonal and communication skills of graduate students.
- A19: Professional training must be given to seafarers to enhance their intercultural communication skills.
- A20: Intercultural dialogue is a key issue that must be addressed to enhance the motivation for intercultural experiences.

- **The Third Dimension: Intercultural language use**

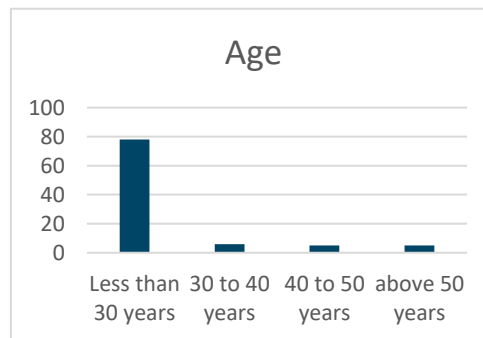
- A21: Intercultural understanding is needed to develop curiosity and openness to otherness.
- A22: The teaching methods must enhance the efficient use of verbal and non-verbal communication.
- A23: Intercultural language competence should be enhanced to improve linguistic proficiency.
- A24: Proficiency in foreign languages is essential for intercultural communication.

- **The Third Axis: Challenges faced by seafarers on board**
 - **The first dimension: Cultural challenges**
 - A25: A intercultural team might face cultural clashes on board.
 - A26: Teaching materials used in universities are disappointing as they might fail to fulfil the requirements of intercultural competence.
 - A27: Limited cultural comprehension may create a sense of disconnectedness, remoteness, and frustration.
 - A28: Seafarers might have problems interpreting verbal or nonverbal expressions of other cultures.
 - **The Second Dimension: Communication challenges**
 - A29: A lack of language competency can create misunderstandings among crewmembers.
 - A30: The inability to speak a common language creates misunderstandings between one vessel and another.
 - A31: Few people can speak another language at an acceptable level.
 - A32: There is a lack of training in understanding gestures and eye contact.
 - **The Third Dimension: Teaching/ learning challenges**
 - A33: The training content superficially deals with topics of interculturalism.
 - A34: Maritime graduates are not acquainted with communication skills.
 - A35: Maritime institutions do not offer courses on communication and cross-cultural competence.
 - A36: There is no recognized method to assess the success of a course in cultural awareness

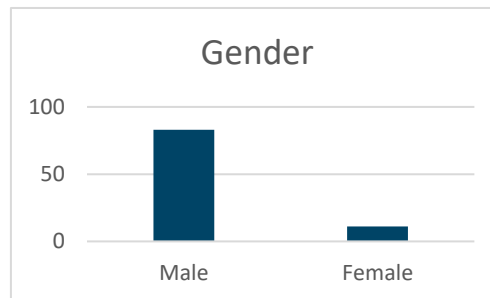
Annex II Survey results

Demographic Results

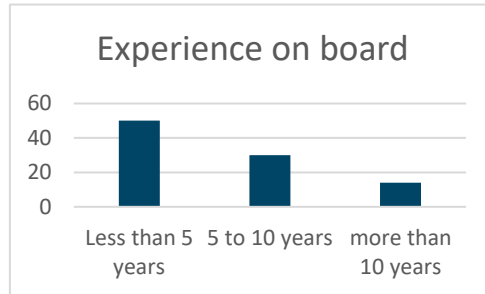
Gender	
Male	83
Female	11



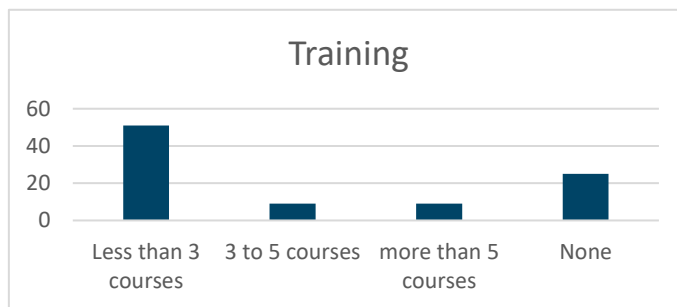
Age	
Less than 30 years	78
30 to 40 years	6
40 to 50 years	5
above 50 years	5



Experience on Board	
Less than 5 years	50
5 to 10 years	30
more than 10 years	14



Training Courses in ICCM	
Less than 3 courses	51
3 to 5 courses	9
more than 5 courses	9
None	25



Reliability Results

Axis 1 Dimension 1

Table 19: Frequentist Scale Reliability Statistics AXIS 1 DIMENSION 1

Estimate	Cronbach's α	Average inter-item correlation
Point estimate	0.819	0.532
95% CI lower bound	0.751	0.391
95% CI upper bound	0.871	0.671

Table 20: Frequentist Individual Item Reliability Statistics AXIS 1 DIMENSION 1

	If item dropped	
Item	Cronbach's α	Item-rest correlation
A1D1Q1	0.775	0.637
A1D1Q2	0.787	0.61
A1D1Q3	0.769	0.649
A1D1Q4	0.759	0.671

Cronbach's Alpha

- The point estimate of Cronbach's alpha is 0.819, indicating high internal consistency reliability for the scale.
- The 95% confidence interval for Cronbach's alpha ranges from 0.751 to 0.871, suggesting that the true reliability of the scale is likely within this range.
- The average inter-item correlation is 0.532, which is also a good indicator of internal consistency.

Individual Item Analysis

- When each item is dropped one at a time, the Cronbach's alpha values for each item are consistently high, ranging from 0.759 to 0.787.
- The item-rest correlation values are also high, ranging from 0.610 to 0.671, indicating that each item correlates well with the total score of the dimension.

Axis 1 Dimension 2

Table 21: Frequentist Scale Reliability Statistics AXIS 1 DIMENSION 2

Estimate	Cronbach's α	Average inter-item correlation
Point estimate	0.699	0.367
95% CI lower bound	0.588	0.251
95% CI upper bound	0.785	0.487

Table 22: Frequentist Individual Item Reliability Statistics A1 D2

	If item dropped	
Item	Cronbach's α	Item-rest correlation
A1D2Q5	0.619	0.51
A1D2Q6	0.615	0.516
A1D2Q7	0.679	0.409
A1D2Q8	0.624	0.502

Cronbach's Alpha

- The point estimate of Cronbach's alpha is 0.699, indicating acceptable internal consistency reliability for the scale.
- The 95% confidence interval for Cronbach's alpha ranges from 0.588 to 0.785, suggesting that the true reliability of the scale is likely within this range.
- The average inter-item correlation is 0.367, which is moderate and indicates reasonable internal consistency.

Individual Item Analysis

- When each item is dropped one at a time, the Cronbach's alpha values for each item range from 0.615 to 0.679.
- The item-rest correlation values are also moderate, ranging from 0.409 to 0.516, indicating that each item correlates reasonably well with the total score of the dimension.

Axis 1 Dimension 3

Table 23: Frequentist Scale Reliability Statistics AXIS 1 DIMENSION 3

Estimate	Cronbach's α	Average inter-item correlation
Point estimate	0.635	0.301
95% CI lower bound	0.5	0.181
95% CI upper bound	0.739	0.424

Table 24: Frequentist Individual Item Reliability Statistics AXIS 1 DIMENSION 3

	If item dropped	
Item	Cronbach's α	Item-rest correlation
A1D3Q9	0.672	0.257
A1D3Q10	0.581	0.392
A1D3Q11	0.383	0.645
A1D3Q12	0.582	0.392

Cronbach's Alpha

- The point estimate of Cronbach's alpha is 0.635, indicating moderate internal consistency reliability for the scale.
- The 95% confidence interval for Cronbach's alpha ranges from 0.500 to 0.739, suggesting that the true reliability of the scale is likely within this range.
- The average inter-item correlation is 0.301, which is relatively low and indicates that the items are not highly correlated with each other.

Individual Item Analysis

- When each item is dropped one at a time, the Cronbach's alpha values for each item vary, with values ranging from 0.383 to 0.672.
- The item-rest correlation values also vary, ranging from 0.257 to 0.645. Item A1D3Q11 has the highest item-rest correlation, while item A1D3Q9 has the lowest.

Axis 2 Dimension 1

Table 25: Frequentist Scale Reliability Statistics AXIS 2 DIMENSION 1

Estimate	Cronbach's α	Average inter-item correlation
Point estimate	0.66	0.326
95% CI lower bound	0.534	0.218
95% CI upper bound	0.757	0.436

Table 26: Frequentist Individual Item Reliability Statistics AXIS 2 DIMENSION 1

	If item dropped	
Item	Cronbach's α	Item-rest correlation
A2D1Q13	0.595	0.438
A2D1Q14	0.624	0.393
A2D1Q15	0.607	0.42
A2D1Q16	0.541	0.514

Cronbach's Alpha

- The point estimate of Cronbach's alpha is 0.660, indicating moderate internal consistency reliability for the scale.
- The 95% confidence interval for Cronbach's alpha ranges from 0.534 to 0.757, suggesting that the true reliability of the scale is likely within this range.
- The average inter-item correlation is 0.326, which is moderate and indicates a reasonable level of correlation between the items.

Individual Item Analysis

- When each item is dropped one at a time, the Cronbach's alpha values for each item vary, with values ranging from 0.541 to 0.624.
- The item-rest correlation values also vary, ranging from 0.393 to 0.514. Item A2D1Q16 has the highest item-rest correlation, while item A2D1Q13 has the lowest.

Axis 2 Dimension 2

Table 27: Frequentist Scale Reliability Statistics AXIS 2 DIMENSION 2

Estimate	Cronbach's α	Average inter-item correlation
Point estimate	0.716	0.384
95% CI lower bound	0.612	0.258
95% CI upper bound	0.796	0.518

Table 28: Frequentist Individual Item Reliability Statistics AXIS 2 DIMENSION 2

	If item dropped	
Item	Cronbach's α	Item-rest correlation
A2D2Q17	0.758	0.312
A2D2Q18	0.58	0.621
A2D2Q19	0.615	0.565
A2D2Q20	0.637	0.533

Cronbach's Alpha

- The point estimate of Cronbach's alpha is 0.716, indicating moderate to good internal consistency reliability for the scale.
- The 95% confidence interval for Cronbach's alpha ranges from 0.612 to 0.796, suggesting that the true reliability of the scale is likely within this range.
- The average inter-item correlation is 0.384, which is moderate and indicates a reasonable level of correlation between the items.

Individual Item Analysis

- When each item is dropped one at a time, the Cronbach's alpha values for each item vary.
- Item A2D2Q18 has the lowest Cronbach's alpha value when dropped, indicating that it contributes the most to the internal consistency of the scale.
- The item-rest correlation values also vary, indicating the degree of each item's contribution to the overall reliability of the scale.

Axis 2 Dimension 3

Table 29: Frequentist Scale Reliability Statistics AXIS 2 DIMENSION 3

Estimate	Cronbach's α	Average inter-item correlation
Point estimate	0.772	0.459
95% CI lower bound	0.688	0.34
95% CI upper bound	0.837	0.585

Table 30: Frequentist Individual Item Reliability Statistics AXIS 2 DIMENSION 3

	If item dropped	
Item	Cronbach's α	Item-rest correlation
A2D3Q21	0.693	0.619
A2D3Q22	0.667	0.666
A2D3Q23	0.716	0.577
A2D3Q24	0.784	0.444

Cronbach's Alpha

- The point estimate of Cronbach's alpha is 0.772, indicating good internal consistency reliability for the scale.
- The 95% confidence interval for Cronbach's alpha ranges from 0.688 to 0.837, suggesting that the true reliability of the scale is likely within this range.
- The average inter-item correlation is 0.459, which is moderate to good and indicates a reasonable level of correlation between the items.

Individual Item Analysis

- When each item is dropped one at a time, the Cronbach's alpha values for each item vary.
- Item A2D3Q24 has the highest Cronbach's alpha value when dropped, indicating that it contributes the most to the internal consistency of the scale.
- The item-rest correlation values also vary, indicating the degree of each item's contribution to the overall reliability of the scale.

Axis 3 Dimension 1

Table 31: Frequentist Scale Reliability Statistics AXIS 3 DIMENSION 1

Estimate	Cronbach's α	Average inter-item correlation
Point estimate	0.772	0.458
95% CI lower bound	0.687	0.329
95% CI upper bound	0.837	0.592

Table 32: Frequentist Individual Item Reliability Statistics AXIS 3 DIMENSION 1

	If item dropped	
Item	Cronbach's α	Item-rest correlation
A3D1Q25	0.705	0.596
A3D1Q26	0.727	0.555
A3D1Q27	0.719	0.569
A3D1Q28	0.717	0.574

Cronbach's Alpha

- The point estimate of Cronbach's alpha is 0.772, indicating good internal consistency reliability for the scale.
- The 95% confidence interval for Cronbach's alpha ranges from 0.687 to 0.837, suggesting that the true reliability of the scale is likely within this range.
- The average inter-item correlation is 0.458, which is moderate to good and indicates a reasonable level of correlation between the items.

Individual Item Analysis

- When each item is dropped one at a time, the Cronbach's alpha values for each item vary.
- All items have relatively high Cronbach's alpha values when dropped, indicating that they contribute to the internal consistency of the scale.
- The item-rest correlation values also show the degree of each item's contribution to the overall reliability of the scale.

Axis 3 Dimension 2

Table 33: Frequentist Scale Reliability Statistics AXIS 3 DIMENSION 2

Estimate	Cronbach's α	Average inter-item correlation
Point estimate	0.719	0.391
95% CI lower bound	0.614	0.256
95% CI upper bound	0.799	0.524

Table 34: Frequentist Individual Item Reliability Statistics AXIS 3 DIMENSION 2

	If item dropped	
Item	Cronbach's α	Item-rest correlation
A3D2Q29	0.601	0.595
A3D2Q30	0.575	0.644
A3D2Q31	0.678	0.471
A3D2Q32	0.752	0.338

Cronbach's Alpha

- The point estimate of Cronbach's alpha is 0.719, indicating good internal consistency reliability for the scale.
- The 95% confidence interval for Cronbach's alpha ranges from 0.614 to 0.799, suggesting that the true reliability of the scale is likely within this range.
- The average inter-item correlation is 0.391, which is moderate and indicates a reasonable level of correlation between the items.

Individual Item Analysis

- When each item is dropped one at a time, the Cronbach's alpha values for each item vary.
- All items have relatively high Cronbach's alpha values when dropped, indicating that they contribute to the internal consistency of the scale.
- The item-rest correlation values also show the degree of each item's contribution to the overall reliability of the scale.

Axis 3 Dimension 3

Table 35: Frequentist Scale Reliability Statistics Axis 3 Dimension 3

Estimate	Cronbach's α	Average inter-item correlation
Point estimate	0.834	0.557
95% CI lower bound	0.772	0.441
95% CI upper bound	0.882	0.664

Table 36: Frequentist Individual Item Reliability Statistics AXIS 3 DIMENSION 3

	If item dropped	
Item	Cronbach's α	Item-rest correlation
A3D3Q33	0.811	0.617
A3D3Q34	0.81	0.619
A3D3Q35	0.801	0.64
A3D3Q36	0.735	0.784

Cronbach's Alpha

- The point estimate of Cronbach's alpha is 0.834, indicating excellent internal consistency reliability for the scale.
- The 95% confidence interval for Cronbach's alpha ranges from 0.772 to 0.882, suggesting that the true reliability of the scale is likely within this range.
- The average inter-item correlation is 0.557, which is moderate to high and indicates a good level of correlation between the items.

Individual Item Analysis

- When each item is dropped one at a time, the Cronbach's alpha values for each item vary.
- All items have relatively high Cronbach's alpha values when dropped, indicating that they contribute to the internal consistency of the scale.
- The item-rest correlation values also show the degree of each item's contribution to the overall reliability of the dimension.

Principal component analysis (PCA)/ Construct Validity

AXIS 1 DIMENSION 1						
Kaiser-Meyer-Olkin Test						
						MSA
Overall MSA						0.697
A1D1Q1						0.722
A1D1Q2						0.705
A1D1Q3						0.677
A1D1Q4						0.689
Chi-squared Test						
		Value	df	p		
Model		31.258	2	< .001		
Component Loadings						
		RC1	Uniqueness			
A1D1Q4		0.83	0.311			
A1D1Q3		0.815	0.336			
A1D1Q1		0.799	0.361			
A1D1Q2		0.778	0.394			
Component Characteristics						
		Unrotated solution		Rotated solution		
	Eigenvalue	Proportion var.	Cumulative	Sum Sq. Loadings	Proportion var.	Cumulative
Component 1	2.598	0.649	0.649	2.598	0.649	0.649

From the results provided, we can interpret the findings of the Principal Component Analysis (PCA) for the first dimension of teaching intercultural competence, which is focused on intercultural training. Let's break down the interpretation:

Kaiser-Meyer-Olkin (KMO) Test:

- The overall measure of sampling adequacy (MSA) is 0.697, indicating that the data is moderately suitable for factor analysis. Additionally, individual MSAs for each item (A1D1Q1 to A1D1Q4) are all above 0.6, which is generally considered acceptable.

Chi-squared Test:

- The chi-squared test shows that the model is statistically significant, with a chi-squared value of 31.258 and 2 degrees of freedom (df), indicating that the variables collectively contribute significantly to the model.

Component Loadings:

- Component loadings represent the correlation between the variables (questions) and the principal component (RC1). Higher loadings indicate a stronger relationship between the variable and the component.
- In this case, all questions (A1D1Q1 to A1D1Q4) have high loadings on the first principal component (RC1), ranging from 0.778 to 0.830. This suggests that these questions are strongly associated with the underlying construct of intercultural training.

Component Characteristics:

- The unrotated solution shows that the first component has an eigenvalue of 2.598, explaining 64.9% of the variance. The rotated solution maintains the same eigenvalue and proportion of explained variance.
- This indicates that the first component captures a substantial amount of variance in the data, suggesting that intercultural training is a dominant factor in explaining the variability among the questions in this dimension.

AXIS 1 DIMENSION 2							
Kaiser-Meyer-Olkin Test							
						MSA	
Overall MSA						0.71	
A1D2Q5						0.699	
A1D2Q6						0.686	
A1D2Q7						0.741	
A1D2Q8						0.727	
Chi-squared Test							
		Value	df	p			
Model		18.629	2	< .001			
Component Loadings							
		RC1	Uniqueness				
A1D2Q6		0.755	0.429				
A1D2Q5		0.752	0.435				
A1D2Q8		0.741	0.451				
A1D2Q7		0.648	0.58				
Component Characteristics							
		Unrotated solution			Rotated solution		
		Eigenvalue	Proportion var.	Cumulative	Sum Sq. Loadings	Proportion var.	Cumulative
Component 1		2.105	0.526	0.526	2.105	0.526	0.526

Kaiser-Meyer-Olkin (KMO) Test:

- The overall measure of sampling adequacy (MSA) is 0.710, indicating that the data is moderately suitable for factor analysis. Each item (A1D2Q5 to A1D2Q8) also has an MSA above 0.6, which is generally considered acceptable.

Chi-squared Test:

- The chi-squared test shows that the model is statistically significant, with a chi-squared value of 18.629 and 2 degrees of freedom (df), indicating that the variables collectively contribute significantly to the model.

Component Loadings:

- **Component loadings** represent the correlation between the variables (questions) and the principal component (RC1). Higher loadings indicate a stronger relationship between the variable and the component.

- In this case, all questions (A1D2Q5 to A1D2Q8) have high loadings on the first principal component (RC1), ranging from 0.648 to 0.755. This suggests that these questions are strongly associated with the underlying construct of intercultural awareness.

Component Characteristics:

- The unrotated solution shows that the first component has an eigenvalue of 2.105, explaining 52.6% of the variance. The rotated solution maintains the same eigenvalue and proportion of explained variance.
- This indicates that the first component captures a substantial amount of variance in the data, suggesting that intercultural awareness is a dominant factor in explaining the variability among the questions in this dimension.

AXIS 1 DIMENSION 3							
Kaiser-Meyer-Olkin Test							
						MSA	
Overall MSA						0.587	
A1D3Q9						0.614	
A1D3Q10						0.696	
A1D3Q11						0.559	
A1D3Q12						0.556	
Chi-squared Test							
		Value	df	p			
Model		18.342	2	< .001			
Component Loadings							
		RC1	Uniqueness				
A1D3Q11		0.873	0.238				
A1D3Q12		0.708	0.499				
A1D3Q10		0.67	0.551				
A1D3Q9		0.49	0.76				
Component Characteristics							
		Unrotated solution			Rotated solution		
		Eigenvalue	Proportion var.	Cumulative	Sum Sq. Loadings	Proportion var.	Cumulative
Component 1		1.952	0.488	0.488	1.952	0.488	0.488

Kaiser-Meyer-Olkin (KMO) Test:

- The overall measure of sampling adequacy (MSA) is 0.587, indicating that the data may be marginally suitable for factor analysis. Each item (A1D3Q9 to A1D3Q12) also has an MSA, with values ranging from 0.556 to 0.696. While some items have MSA values above 0.6, indicating moderate suitability, others fall slightly below this threshold.

Chi-squared Test:

- The chi-squared test shows that the model is statistically significant, with a chi-squared value of 18.342 and 2 degrees of freedom (df), indicating that the variables collectively contribute significantly to the model.

Component Loadings:

- Component loadings represent the correlation between the variables (questions) and the principal component (RC1). Higher loadings indicate a stronger relationship between the variable and the component.
- In this case, questions A1D3Q11 to A1D3Q10 have relatively high loadings on the first principal component (RC1), ranging from 0.490 to 0.873. These loadings suggest a moderate to strong association between these questions and the underlying construct of intercultural curricula.

Component Characteristics:

- **The** unrotated solution shows that the first component has an eigenvalue of 1.952, explaining 48.8% of the variance. The rotated solution maintains the same eigenvalue and proportion of explained variance.
- This indicates that the first component captures a substantial amount of variance in the data, suggesting that intercultural curricula is a dominant factor in explaining the variability among the questions in this dimension.

AXIS 2 DIMENSION 1							
Kaiser-Meyer-Olkin Test							
						MSA	
Overall MSA						0.69	
A2D1Q13						0.686	
A2D1Q14						0.748	
A2D1Q15						0.694	
A2D1Q16						0.658	
Chi-squared Test							
		Value	df	p			
Model		17.581	2	< .001			
Component Loadings							
		RC1	Uniqueness				
A2D1Q16		0.772	0.404				
A2D1Q13		0.704	0.504				
A2D1Q15		0.685	0.531				
A2D1Q14		0.651	0.576				
Component Characteristics							
		Unrotated solution			Rotated solution		
		Eigenvalue	Proportion var.	Cumulative	Sum Sq. Loadings	Proportion var.	Cumulative
Component 1		1.984	0.496	0.496	1.984	0.496	0.496

Kaiser-Meyer-Olkin (KMO) Test:

- The overall measure of sampling adequacy (MSA) is 0.690, indicating that the data may be marginally suitable for factor analysis. Each item (A2D1Q13 to A2D1Q16) also has an MSA, with values ranging from 0.658 to 0.748. While some items have MSA values above 0.6, indicating moderate suitability, others fall slightly below this threshold.

Chi-squared Test:

- The chi-squared test shows that the model is statistically significant, with a chi-squared value of 17.581 and 2 degrees of freedom (df), indicating that the variables collectively contribute significantly to the model.

Component Loadings:

- Component loadings represent the correlation between the variables (questions) and the principal component (RC1). Higher loadings indicate a stronger relationship between the variable and the component.
- In this case, questions A2D1Q16 to A2D1Q13 have relatively high loadings on the first principal component (RC1), ranging from 0.651 to 0.772. These loadings suggest a moderate to strong association between these questions and the underlying construct of communication programs in teaching.

Component Characteristics:

- The unrotated solution shows that the first component has an eigenvalue of 1.984, explaining 49.6% of the variance. The rotated solution maintains the same eigenvalue and proportion of explained variance.
- This indicates that the first component captures a substantial amount of variance in the data, suggesting that communication programs in teaching is a dominant factor in explaining the variability among the questions in this dimension.

AXIS 2 DIMENSION 2							
Kaiser-Meyer-Olkin Test							
						MSA	
Overall MSA						0.72	
A2D2Q17						0.844	
A2D2Q18						0.675	
A2D2Q19						0.701	
A2D2Q20						0.768	
Chi-squared Test							
		Value	df	p			
Model		14.785	2	< .001			
Component Loadings							
		RC1	Uniqueness				
A2D2Q18		0.835	0.303				
A2D2Q19		0.799	0.362				
A2D2Q20		0.765	0.416				
A2D2Q17		0.518	0.731				
Component Characteristics							
		Unrotated solution			Rotated solution		
		Eigenvalue	Proportion var.	Cumulative	Sum Sq. Loadings	Proportion var.	Cumulative
Component 1		2.189	0.547	0.547	2.189	0.547	0.547

Kaiser-Meyer-Olkin (KMO) Test:

- The overall measure of sampling adequacy (MSA) is 0.720, indicating that the data are moderately suitable for factor analysis. Each item (A2D2Q17 to A2D2Q20) also has an MSA, with values ranging from 0.675 to 0.844. These values suggest that the items collectively may be suitable for further analysis.

Chi-squared Test:

- The chi-squared test shows that the model is statistically significant, with a chi-squared value of 14.785 and 2 degrees of freedom (df), indicating that the variables together contribute significantly to the model.

Component Loadings:

- Component loadings represent the correlation between the variables (questions) and the principal component (RC1). Higher loadings indicate a stronger relationship between the variable and the component.
- In this case, questions A2D2Q18 to A2D2Q20 have relatively high loadings on the first principal component (RC1), ranging from 0.765 to 0.835. Question A2D2Q17 has a lower loading of 0.518, indicating a weaker association with the underlying construct of intercultural communication.

Component Characteristics:

- The unrotated solution shows that the first component has an eigenvalue of 2.189, explaining 54.7% of the variance. The rotated solution maintains the same eigenvalue and proportion of explained variance.
- This indicates that the first component captures a substantial amount of variance in the data, suggesting that intercultural communication is a dominant factor in explaining the variability among the questions in this dimension.

AXIS 2 DIMENSION 3							
Kaiser-Meyer-Olkin Test							
						MSA	
Overall MSA						0.767	
A2D3Q21						0.768	
A2D3Q22						0.729	
A2D3Q23						0.773	
A2D3Q24						0.841	
Chi-squared Test							
		Value	df	p			
Model		13.78	2	0.001			
Component Loadings							
		RC1	Uniqueness				
A2D3Q22		0.842	0.291				
A2D3Q21		0.809	0.345				
A2D3Q23		0.78	0.392				
A2D3Q24		0.649	0.579				
Component Characteristics							
		Unrotated solution			Rotated solution		
		Eigenvalue	Proportion var.	Cumulative	Sum Sq. Loadings	Proportion var.	Cumulative
Component 1		2.392	0.598	0.598	2.392	0.598	0.598

Kaiser-Meyer-Olkin (KMO) Test:

- The overall measure of sampling adequacy (MSA) is 0.767, indicating that the data are suitable for factor analysis. Each item (A2D3Q21 to A2D3Q24) also has an MSA, with values ranging from 0.729 to 0.841. These values suggest that the items collectively are suitable for further analysis.

Chi-squared Test:

- The chi-squared test shows that the model is statistically significant, with a chi-squared value of 13.780 and 2 degrees of freedom (df), indicating that the variables together contribute significantly to the model.

Component Loadings:

- Component loadings represent the correlation between the variables (questions) and the principal component (RC1). Higher loadings indicate a stronger relationship between the variable and the component.
- In this case, questions A2D3Q22 to A2D3Q24 have relatively high loadings on the first principal component (RC1), ranging from 0.649 to 0.842. Question A2D3Q21 also has a high loading of 0.809, indicating a strong association with the underlying construct of intercultural language use.

Component Characteristics:

- The unrotated solution shows that the first component has an eigenvalue of 2.392, explaining 59.8% of the variance. The rotated solution maintains the same eigenvalue and proportion of explained variance.
- This indicates that the first component captures a substantial amount of variance in the data, suggesting that intercultural language use is a dominant factor in explaining the variability among the questions in this dimension.

AXIS 3 DIMENSION 1							
Kaiser-Meyer-Olkin Test							
						MSA	
Overall MSA						0.723	
A3D1Q25						0.717	
A3D1Q26						0.719	
A3D1Q27						0.73	
A3D1Q28						0.725	
Chi-squared Test							
		Value	df	p			
Model		25.221	2	< .001			
Component Loadings							
		RC1	Uniqueness				
A3D1Q25		0.79	0.375				
A3D1Q28		0.769	0.408				
A3D1Q27		0.766	0.414				
A3D1Q26		0.757	0.427				
Component Characteristics							
		Unrotated solution			Rotated solution		
		Eigenvalue	Proportion var.	Cumulative	Sum Sq. Loadings	Proportion var.	Cumulative
Component 1		2.375	0.594	0.594	2.375	0.594	0.594

Kaiser-Meyer-Olkin (KMO) Test:

- The overall measure of sampling adequacy (MSA) is 0.723, indicating that the data are suitable for factor analysis. Each item (A3D1Q25 to A3D1Q28) also has an MSA, with values ranging from 0.717 to 0.730. These values suggest that the items collectively are suitable for further analysis.

Chi-squared Test:

- The chi-squared test shows that the model is statistically significant, with a chi-squared value of 25.221 and 2 degrees of freedom (df), indicating that the variables together contribute significantly to the model.

Component Loadings:

- Component loadings represent the correlation between the variables (questions) and the principal component (RC1). Higher loadings indicate a stronger relationship between the variable and the component.
- In this case, questions A3D1Q25 to A3D1Q28 have relatively high loadings on the first principal component (RC1), ranging from 0.757 to 0.790. These loadings suggest a strong association with the underlying construct of cultural challenges faced by seafarers.

Component Characteristics:

- The unrotated solution shows that the first component has an eigenvalue of 2.375, explaining 59.4% of the variance. The rotated solution maintains the same eigenvalue and proportion of explained variance.
- This indicates that the first component captures a substantial amount of variance in the data, suggesting that cultural challenges are a dominant factor in explaining the variability among the questions in this dimension.

AXIS 3 DIMENSION 2							
Kaiser-Meyer-Olkin Test							
						MSA	
Overall MSA						0.696	
A3D2Q29						0.676	
A3D2Q30						0.645	
A3D2Q31						0.763	
A3D2Q32						0.834	
Chi-squared Test							
		Value	df	p			
Model		15.308	2	< .001			
Component Loadings							
		RC1	Uniqueness				
A3D2Q30		0.852	0.274				
A3D2Q29		0.819	0.33				
A3D2Q31		0.715	0.488				
A3D2Q32		0.55	0.698				
Component Characteristics							
		Unrotated solution			Rotated solution		
		Eigenvalue	Proportion var.	Cumulative	Sum Sq. Loadings	Proportion var.	Cumulative
Component 1		2.21	0.552	0.552	2.21	0.552	0.552

Kaiser-Meyer-Olkin (KMO) Test:

- The overall measure of sampling adequacy (MSA) is 0.696, indicating that the data are suitable for factor analysis. Each item (A3D2Q29 to A3D2Q32) also has an MSA, with values ranging from 0.645 to 0.834. These values suggest that the items collectively are suitable for further analysis.

Chi-squared Test:

- The chi-squared test shows that the model is statistically significant, with a chi-squared value of 15.308 and 2 degrees of freedom (df), indicating that the variables together contribute significantly to the model.

Component Loadings:

- Component loadings represent the correlation between the variables (questions) and the principal component (RC1). Higher loadings indicate a stronger relationship between the variable and the component.
- In this case, questions A3D2Q29 to A3D2Q32 have relatively high loadings on the first principal component (RC1), ranging from 0.550 to 0.852. These loadings suggest a strong association with the underlying construct of communication challenges faced by seafarers.

Component Characteristics:

- The unrotated solution shows that the first component has an eigenvalue of 2.210, explaining 55.2% of the variance. The rotated solution maintains the same eigenvalue and proportion of explained variance.
- This indicates that the first component captures a substantial amount of variance in the data, suggesting that communication challenges are a dominant factor in explaining the variability among the questions in this dimension.

AXIS 3 DIMENSION 3							
Kaiser-Meyer-Olkin Test							
						MSA	
Overall MSA						0.714	
A3D3Q33						0.708	
A3D3Q34						0.842	
A3D3Q35						0.684	
A3D3Q36						0.67	
Chi-squared Test							
		Value	df	p			
Model		26.504	2	< .001			
Component Loadings							
		RC1	Uniqueness				
A3D3Q36		0.896	0.197				
A3D3Q35		0.805	0.353				
A3D3Q33		0.785	0.384				
A3D3Q34		0.782	0.388				
Component Characteristics							
		Unrotated solution			Rotated solution		
		Eigenvalue	Proportion var.	Cumulative	Sum Sq. Loadings	Proportion var.	Cumulative
Component 1		2.678	0.669	0.669	2.678	0.669	0.669

Kaiser-Meyer-Olkin (KMO) Test:

- The overall measure of sampling adequacy (MSA) is 0.714, indicating that the data are suitable for factor analysis. Each item (A3D3Q33 to A3D3Q36) also has an MSA, with values ranging from 0.670 to 0.842. These values suggest that the items collectively are suitable for further analysis.

Chi-squared Test:

- The chi-squared test shows that the model is statistically significant, with a chi-squared value of 26.504 and 2 degrees of freedom (df), indicating that the variables together contribute significantly to the model.

Component Loadings:

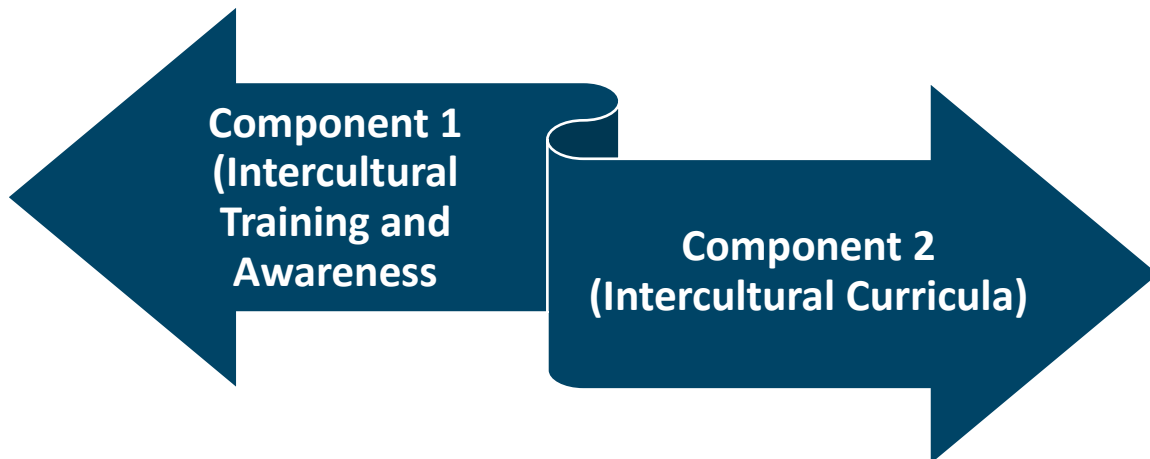
- Component loadings represent the correlation between the variables (questions) and the principal component (RC1). Higher loadings indicate a stronger relationship between the variable and the component.
- In this case, questions A3D3Q33 to A3D3Q36 have relatively high loadings on the first principal component (RC1), ranging from 0.782 to 0.896. These loadings suggest a strong association with the underlying construct of teaching/learning challenges faced by seafarers.

Component Characteristics:

- The unrotated solution shows that the first component has an eigenvalue of 2.678, explaining 66.9% of the variance. The rotated solution maintains the same eigenvalue and proportion of explained variance.

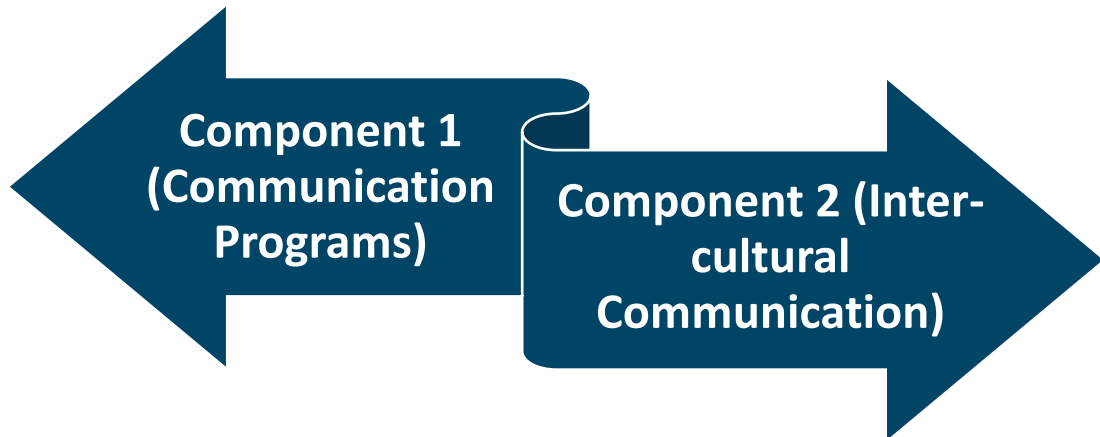
Component identification

Based on the provided survey items, here is a description of the components identified through PCA for each dimension:



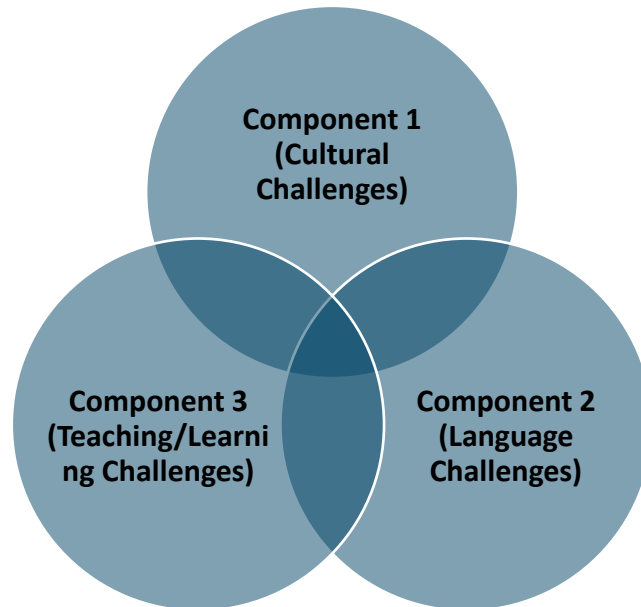
The First Axis: Teaching Intercultural Competence

- Component 1 (Intercultural Training and Awareness): This component captures the importance of cross-cultural training and awareness in preparing seafarers and students for multicultural environments. It emphasizes the need for realistic expectations, stress reduction, and sensitivity to cultural differences.
- Component 2 (Intercultural Curricula): This component focuses on the role of intercultural curricula in maritime education and training institutions. It highlights the importance of preparing professionals with language competencies, cross-cultural understanding, and acceptance of others' cultures.



The Second Axis: Teaching Communication Competences

- **Component 1 (Communication Programs):** This component emphasizes the significance of communication programs in helping students recognize cultural commonalities and differences, improving crew communication, and enhancing leadership's cross-cultural competency.
- **Component 2 (Inter-cultural Communication):** This component highlights the role of intercultural dialogue and professional training in enhancing interpersonal and communication skills, as well as motivating individuals for intercultural experiences.



The Third Axis: Challenges Faced by Seafarers On board

- **Component 1 (Cultural Challenges):** This component addresses the cultural challenges faced by multicultural teams on board, including cultural clashes, limited cultural comprehension, and difficulties in interpreting cultural expressions.
- **Component 2 (Communication challenges):** This component focuses on language-related challenges, such as the lack of language competency leading to misunderstandings among crew members, difficulties in communication between vessels, and the absence of training in understanding non-verbal communication cues.
- **Component 3 (Teaching/Learning Challenges):** This component highlights the challenges related to teaching and learning intercultural competence, including the superficial treatment of multiculturalism in training content, inadequate communication skills among maritime graduates, the absence of courses on communication and cross-cultural competence, and the lack of recognized methods to assess the success of cultural awareness courses.

These components provide a structured way to understand the key themes and challenges related to teaching intercultural competence, communication competences, and the challenges faced by seafarers on board. They offer valuable insights for educational institutions, training programs, and policymakers in addressing these issues effectively.

Confirmatory Factor Analysis

Axis 1 (Component 1 and 2)							
Chi-square test							
Model				χ^2	df	p	
Baseline model				1287.96	66		
Factor model				170.028	53	< .001	
Factor loadings							
						95% Confidence Interval	
Factor	Indicator	Estimate	Std. Error	z-value	p	Lower	Upper
Factor 1	A1D1Q1	0.716	0.032	22.148	< .001	0.652	0.779
	A1D1Q2	0.713	0.033	21.668	< .001	0.648	0.777
	A1D1Q3	0.824	0.03	27.791	< .001	0.766	0.882
	A1D1Q4	0.794	0.03	26.556	< .001	0.736	0.853
	A1D2Q5	0.695	0.035	20.141	< .001	0.628	0.763
	A1D2Q6	0.725	0.034	21.59	< .001	0.659	0.791
	A1D2Q7	0.5	0.038	13.23	< .001	0.426	0.574
	A1D2Q8	0.676	0.033	20.804	< .001	0.613	0.74
Factor 2	A1D3Q9	0.277	0.043	6.388	< .001	0.192	0.362
	A1D3Q10	0.556	0.037	15.033	< .001	0.484	0.628
	A1D3Q11	0.833	0.041	20.217	< .001	0.753	0.914
	A1D3Q12	0.781	0.041	19.094	< .001	0.701	0.861
Factor variances							
				95% Confidence Interval			
Factor	Estimate	Std. Error	Lower	Upper			
Factor 1	1	0	1	1			
Factor 2	1	0	1	1			

Factor Covariances								
							95% Confidence Interval	
			Estimate	Std. Error	z-value	p	Lower	Upper
Factor 1	↔	Factor 2	0.895	0.044	20.499	< .001	0.809	0.98
Residual variances								
				95% Confidence Interval				
Indicator		Estimate	Std. Error	Lower	Upper			
A1D1Q1		0.488	0	0.488	0.488			
A1D1Q2		0.492	0	0.492	0.492			
A1D1Q3		0.321	0	0.321	0.321			
A1D1Q4		0.369	0	0.369	0.369			
A1D2Q5		0.516	0	0.516	0.516			
A1D2Q6		0.475	0	0.475	0.475			
A1D2Q7		0.75	0	0.75	0.75			
A1D2Q8		0.543	0	0.543	0.543			
A1D3Q9		0.923	0	0.923	0.923			
A1D3Q10		0.691	0	0.691	0.691			
A1D3Q11		0.305	0	0.305	0.305			
A1D3Q12		0.39	0	0.39	0.39			
Thresholds								
							95% Confidence Interval	
Indicator	Threshold	Estimate	Std. Error	z-value	p	Lower	Upper	
A1D1Q1	t1	-0.411	0.134	-3.069	0.002	-0.674	-0.149	
	t2	0.161	0.131	1.231	0.218	-0.095	0.417	
	t3	0.561	0.138	4.078	4.544×10^{-5}	0.292	0.831	
	t4	1.041	0.159	6.543	6.014×10^{-11}	0.729	1.353	
A1D1Q2	t1	-0.47	0.135	-3.474	5.130×10^{-4}	-0.735	-0.205	
	t2	0.08	0.13	0.615	0.538	-0.175	0.335	
	t3	0.625	0.14	4.477	7.573×10^{-6}	0.351	0.899	

	t4	1.041	0.159	6.543	6.014×10^{-11}	0.729	1.353
A1D1Q3	t1	-0.5	0.136	-3.676	2.371×10^{-4}	-0.767	-0.233
	t2	0.027	0.13	0.205	0.837	-0.228	0.281
	t3	0.691	0.142	4.872	1.106×10^{-6}	0.413	0.969
	t4	1.138	0.166	6.867	6.560×10^{-12}	0.813	1.462
A1D1Q4	t1	-0.5	0.136	-3.676	2.371×10^{-4}	-0.767	-0.233
	t2	0.107	0.13	0.821	0.412	-0.148	0.362
	t3	0.625	0.14	4.477	7.573×10^{-6}	0.351	0.899
	t4	1.138	0.166	6.867	6.560×10^{-12}	0.813	1.462
A1D2Q5	t1	-0.27	0.132	-2.049	0.04	-0.528	-0.012
	t2	0	0.13	0	1	-0.255	0.255
	t3	0.561	0.138	4.078	4.544×10^{-5}	0.292	0.831
	t4	1.041	0.159	6.543	6.014×10^{-11}	0.729	1.353
A1D2Q6	t1	-0.441	0.135	-3.271	0.001	-0.704	-0.177
	t2	0	0.13	0	1	-0.255	0.255
	t3	0.561	0.138	4.078	4.544×10^{-5}	0.292	0.831
	t4	1.246	0.174	7.154	8.444×10^{-13}	0.905	1.587
A1D2Q7	t1	-0.531	0.137	-3.877	1.057×10^{-4}	-0.799	-0.262
	t2	0.08	0.13	0.615	0.538	-0.175	0.335
	t3	0.726	0.143	5.067	4.036×10^{-7}	0.445	1.006
	t4	1.19	0.17	7.016	2.284×10^{-12}	0.858	1.522
A1D2Q8	t1	-0.382	0.133	-2.865	0.004	-0.644	-0.121
	t2	0.188	0.131	1.435	0.151	-0.069	0.444
	t3	0.561	0.138	4.078	4.544×10^{-5}	0.292	0.831
	t4	1.19	0.17	7.016	2.284×10^{-12}	0.858	1.522
A1D3Q9	t1	-0.441	0.135	-3.271	0.001	-0.704	-0.177

	t2	0.107	0.13	0.821	0.412	-0.148	0.362
	t3	0.625	0.14	4.477	7.573×10^{-6}	0.351	0.899
	t4	0.996	0.156	6.372	1.867×10^{-10}	0.69	1.303
A1D3Q1 0	t1	-0.326	0.132	-2.458	0.014	-0.585	-0.066
	t2	0.215	0.131	1.64	0.101	-0.042	0.472
	t3	0.593	0.139	4.278	1.887×10^{-5}	0.321	0.865
	t4	1.19	0.17	7.016	2.284×10^{-12}	0.858	1.522
A1D3Q1 1	t1	-0.326	0.132	-2.458	0.014	-0.585	-0.066
	t2	0.188	0.131	1.435	0.151	-0.069	0.444
	t3	0.593	0.139	4.278	1.887×10^{-5}	0.321	0.865
	t4	0.996	0.156	6.372	1.867×10^{-10}	0.69	1.303
A1D3Q1 2	t1	-0.107	0.13	-0.821	0.412	-0.362	0.148
	t2	0.188	0.131	1.435	0.151	-0.069	0.444
	t3	0.593	0.139	4.278	1.887×10^{-5}	0.321	0.865
	t4	1.19	0.17	7.016	2.284×10^{-12}	0.858	1.522

1. Chi-square Test:

- The chi-square test evaluates the difference between the observed covariance matrix and the model-implied covariance matrix.
- In this analysis, the baseline model (with no specified factors) has a chi-square value of 1287.960 with 66 degrees of freedom.
- The factor model has a chi-square value of 170.028 with 53 degrees of freedom.
- A significant p-value (less than the chosen significance level, typically 0.05) for the factor model suggests that the specified model fits the data better than the baseline model.

2. Factor Loadings Table:

- Factor loadings represent the strength of the relationship between the latent factors and the observed variables (indicators).

- Each row represents an observed variable, and the columns show the factor to which it belongs, the estimate of the loading, standard error, z-value, and p-value.
- For example, for Factor 1, indicator A1D1Q1 has a loading of 0.716, indicating a strong positive relationship with Factor 1.
- High factor loadings (close to 1) suggest that the observed variable is a good indicator of the underlying latent factor.

3. Factor Variances Table:

- This table displays the estimated variances of the latent factors.
- Each row represents a latent factor, and the columns show the estimate, standard error, z-value, and p-value.
- The estimated variances are standardized to 1 for identification purposes.

4. Factor Covariances Table:

- Factor covariances represent the relationships between pairs of latent factors.
- The table shows the estimated covariance between Factor 1 and Factor 2, along with the standard error, z-value, and p-value.
- A significant covariance indicates a meaningful relationship between the two factors.

5. Residual Variances Table:

- Residual variances represent the amount of variance in the observed variables that is not explained by the latent factors.
- Each row corresponds to an observed variable, and the columns show the estimate, standard error, z-value, and p-value.
- Residual variances are typically constrained to be equal across indicators for identification.

6. Thresholds Table:

- Thresholds are specific to categorical indicators and represent the cut-points on the latent variable continuum that define the categories.
- Each row corresponds to an observed variable and its thresholds, along with their estimates, standard errors, z-values, and p-values.
- Thresholds are relevant for categorical indicators, indicating the points at which respondents are more likely to endorse particular response categories.

Interpretation and Justification:

- Based on the chi-square test, the factor model fits the data significantly better than the baseline model, indicating that the specified model (with latent factors) adequately captures the relationships among the observed variables.
- The factor loadings show strong associations between the observed variables and their respective latent factors, supporting the validity of the measurement model.
- The factor variances being equal to 1 indicates that the latent factors are scaled appropriately.
- The significant factor covariances suggest meaningful relationships between pairs of latent factors.
- Residual variances indicate the amount of unexplained variance in the observed variables after accounting for the latent factors.
- Thresholds are relevant for categorical indicators and provide insights into the categorization of responses based on the underlying latent variables.

Overall, these results suggest that the specified CFA model, based on the components identified through PCA, provides a good fit to the data and effectively captures the underlying structure of the constructs related to teaching intercultural competence in maritime education and training.

Axis 2 Component 1 and 2							
Chi-square test							
Model				X ²	df	p	
Baseline model				1050.207	66		
Factor model				157.755	53	< .001	
Factor loadings							
						95% Confidence Interval	
Factor	Indicator	Estimate	Std. Error	z-value	p	Lower	Upper
Factor 1	A2D1Q13	0.82	0.064	12.775	< .001	0.694	0.945
	A2D1Q14	0.673	0.06	11.215	< .001	0.555	0.79
	A2D1Q15	0.31	0.056	5.514	< .001	0.2	0.42
	A2D1Q16	0.566	0.057	9.853	< .001	0.454	0.679
Factor 2	A2D2Q17	0.506	0.041	12.229	< .001	0.425	0.587
	A2D2Q18	0.768	0.035	22.065	< .001	0.699	0.836
	A2D2Q19	0.757	0.036	20.868	< .001	0.686	0.828
	A2D2Q20	0.812	0.033	24.469	< .001	0.747	0.878
	A2D3Q21	0.822	0.035	23.223	< .001	0.753	0.891
	A2D3Q22	0.82	0.034	24.173	< .001	0.754	0.887

	A2D3Q2 3	0.716	0.033	21.417	< . 00 1	0.65	0. 78 1
	A2D3Q2 4	0.563	0.041	13.865	< . 00 1	0.483	0. 64 2
Factor variances							
				95% Confidence Interval			
Factor	Estimate	Std. Error	Lower		Upper		
Factor 1	1	0	1		1		
Factor 2	1	0	1		1		
Factor Covariances							
						95% Confidence Interval	
		Estimate	Std. Error	z-value	p	Lower	Upper
Factor 1	↔	Factor 2	0.624	0.048	13.109	< . 00 1	0.531 0.718
Residual variances							
				95% Confidence Interval			
Indicator	Estimate	Std. Error	Lower		Upper		
A2D1Q13	0.328	0	0.328		0.328		
A2D1Q14	0.548	0	0.548		0.548		
A2D1Q15	0.904	0	0.904		0.904		
A2D1Q16	0.679	0	0.679		0.679		
A2D2Q17	0.744	0	0.744		0.744		
A2D2Q18	0.411	0	0.411		0.411		
A2D2Q19	0.427	0	0.427		0.427		
A2D2Q20	0.34	0	0.34		0.34		
A2D3Q21	0.324	0	0.324		0.324		
A2D3Q22	0.327	0	0.327		0.327		
A2D3Q23	0.488	0	0.488		0.488		
A2D3Q24	0.683	0	0.683		0.683		
Thresholds							
						95% Confidence Interval	
Indicator	Threshold	Estimate	Std. Error	z-value	p	Lower	Upper

A2D1Q 13	t1	-0.27	0.132	-2.049	0.04	-0.528	-0.012
	t2	0.053	0.13	0.41	0.682	-0.201	0.308
	t3	0.354	0.133	2.662	0.008	0.093	0.615
	t4	1.138	0.166	6.867	6.560×10^{-12}	0.813	1.462
A2D1Q 14	t1	-0.326	0.132	-2.458	0.014	-0.585	-0.066
	t2	0.134	0.13	1.026	0.305	-0.122	0.389
	t3	0.47	0.135	3.474	5.130×10^{-4}	0.205	0.735
	t4	1.088	0.162	6.709	1.962×10^{-11}	0.77	1.406
A2D1Q 15	t1	-0.161	0.131	-1.231	0.218	-0.417	0.095
	t2	0.188	0.131	1.435	0.151	-0.069	0.444
	t3	0.531	0.137	3.877	1.057×10^{-4}	0.262	0.799
	t4	1.088	0.162	6.709	1.962×10^{-11}	0.77	1.406
A2D1Q 16	t1	-0.161	0.131	-1.231	0.218	-0.417	0.095
	t2	0.161	0.131	1.231	0.218	-0.095	0.417
	t3	0.5	0.136	3.676	2.371×10^{-4}	0.233	0.767
	t4	1.041	0.159	6.543	6.014×10^{-11}	0.729	1.353
A2D2Q 17	t1	-0.411	0.134	-3.069	0.002	-0.674	-0.149
	t2	0.107	0.13	0.821	0.412	-0.148	0.362
	t3	0.658	0.141	4.675	2.941×10^{-6}	0.382	0.934
	t4	1.138	0.166	6.867	6.560×10^{-12}	0.813	1.462
A2D2Q 18	t1	-0.242	0.131	-1.845	0.065	-0.5	0.015
	t2	0.134	0.13	1.026	0.305	-0.122	0.389
	t3	0.5	0.136	3.676	2.371×10^{-4}	0.233	0.767
	t4	1.088	0.162	6.709	1.962×10^{-11}	0.77	1.406

A2D2Q 19	t1	-0.242	0.131	-1.845	0.065	-0.5	0.015
	t2	0.161	0.131	1.231	0.218	-0.095	0.417
	t3	0.441	0.135	3.271	0.001	0.177	0.704
	t4	0.953	0.154	6.195	5.817×10^{-10}	0.652	1.255
A2D2Q 20	t1	-0.354	0.133	-2.662	0.008	-0.615	-0.093
	t2	0.188	0.131	1.435	0.151	-0.069	0.444
	t3	0.658	0.141	4.675	2.941×10^{-6}	0.382	0.934
	t4	1.138	0.166	6.867	6.560×10^{-12}	0.813	1.462
A2D3Q 21	t1	-0.298	0.132	-2.254	0.024	-0.557	-0.039
	t2	0.188	0.131	1.435	0.151	-0.069	0.444
	t3	0.593	0.139	4.278	1.887×10^{-5}	0.321	0.865
	t4	1.088	0.162	6.709	1.962×10^{-11}	0.77	1.406
A2D3Q 22	t1	-0.298	0.132	-2.254	0.024	-0.557	-0.039
	t2	0.215	0.131	1.64	0.101	-0.042	0.472
	t3	0.561	0.138	4.078	4.544×10^{-5}	0.292	0.831
	t4	1.041	0.159	6.543	6.014×10^{-11}	0.729	1.353
A2D3Q 23	t1	-0.411	0.134	-3.069	0.002	-0.674	-0.149
	t2	0.188	0.131	1.435	0.151	-0.069	0.444
	t3	0.561	0.138	4.078	4.544×10^{-5}	0.292	0.831
	t4	1.19	0.17	7.016	2.284×10^{-12}	0.858	1.522
A2D3Q 24	t1	-0.215	0.131	-1.64	0.101	-0.472	0.042
	t2	0.215	0.131	1.64	0.101	-0.042	0.472
	t3	0.625	0.14	4.477	7.573×10^{-6}	0.351	0.899
	t4	1.088	0.162	6.709	1.962×10^{-11}	0.77	1.406

1. Chi-square Test:

- The baseline model has a chi-square value of 1050.207 with 66 degrees of freedom.
- The factor model, which includes the specified factors, has a significantly lower chi-square value of 157.755 with 53 degrees of freedom (df), indicating a better fit to the data (p-value < 0.001).

2. Factor Loadings:

- Factor loadings represent the relationship between the observed variables (indicators) and the underlying latent factors.
- All factor loadings are statistically significant (p-value < 0.001), indicating that the observed variables are well-represented by the latent factors.
- For Factor 1 (representing Communication Programs), the factor loadings range from 0.310 to 0.820, suggesting that the indicators (A2D1Q13, A2D1Q14, A2D1Q15, A2D1Q16) strongly contribute to this factor.
- For Factor 2 (representing Intercultural Communication), the factor loadings range from 0.506 to 0.822, indicating strong relationships between the indicators (A2D2Q17, A2D2Q18, A2D2Q19, A2D2Q20, A2D3Q21, A2D3Q22, A2D3Q23, A2D3Q24) and this factor.

3. Factor Variances:

The estimated variances for both Factor 1 and Factor 2 are 1.000, indicating that each factor explains all the variance in its respective indicators. This suggests that the factors are well-defined and distinct.

4. Factor Covariances:

The covariance between Factor 1 (Communication Programs) and Factor 2 (Intercultural Communication) is estimated to be 0.624 with a 95% confidence interval of (0.531, 0.718), and it is statistically significant (p-value < 0.001). This indicates a moderate positive relationship between the two factors.

5. Residual Variances:

- Residual variances represent the amount of variance in the observed variables that is not explained by the latent factors.
- All residual variances are estimated to be non-zero, suggesting that there is some unique variance in each indicator that is not captured by the specified factors.

In summary, the CFA results indicate that the specified factors (Communication Programs and Intercultural Communication) provide a good fit to the data and effectively represent the underlying constructs. These findings support the validity and reliability of the

"Second Axis: Teaching Communication Competences" framework in assessing communication competencies in a cross-cultural context.

Axis 3 (Component 1, 2, and 3)							
Chi-square test							
Model		X²		df	p		
Baseline model		1784.294		66			
Factor model		185.947		51	< .001		
Factor loadings							
						95% Confidence Interval	
Factor	Indicator	Estimate	Std. Error	z-value	p	Lower	Upper
Factor 1	A3D1Q 25	0.643	0.031	20.73	< .001	0.582	0.704
	A3D1Q 26	0.653	0.031	20.896	< .001	0.592	0.714
	A3D1Q 27	0.858	0.031	28.118	< .001	0.798	0.918
	A3D1Q 28	0.852	0.031	27.682	< .001	0.792	0.912
Factor 2	A3D2Q 29	0.805	0.031	26.221	< .001	0.745	0.865
	A3D2Q 30	0.808	0.03	26.63	< .001	0.749	0.867
	A3D2Q 31	0.519	0.033	15.893	< .001	0.455	0.583
	A3D2Q 32	0.701	0.032	21.755	< .001	0.638	0.765
Factor 3	A3D3Q 33	0.756	0.027	27.86	< .001	0.703	0.811
	A3D3Q 34	0.816	0.028	28.96	< .001	0.761	0.871
	A3D3Q 35	0.815	0.026	31.347	< .001	0.764	0.866
	A3D3Q 36	0.923	0.025	37.133	< .001	0.874	0.972
Factor variances							
				95% Confidence Interval			
Factor	Estimate	Std. Error		Lower		Upper	
Factor 1	1	0		1		1	
Factor 2	1	0		1		1	
Factor 3	1	0		1		1	

Factor Covariances								
						95% Confidence Interval		
			Estimate	Std. Error	z-value	p	Lower	Upper
Factor 1	↔	Factor 2	0.963	0.047	20.61	< .001	0.872	1.055
Factor 1	↔	Factor 3	0.964	0.038	25.672	< .001	0.89	1.038
Factor 2	↔	Factor 3	0.97	0.041	23.785	< .001	0.89	1.05
Residual variances								
				95% Confidence Interval				
Indicator		Estimate	Std. Error	Lower	Upper			
A3D1Q25		0.587	0	0.587	0.587			
A3D1Q26		0.574	0	0.574	0.574			
A3D1Q27		0.264	0	0.264	0.264			
A3D1Q28		0.274	0	0.274	0.274			
A3D2Q29		0.352	0	0.352	0.352			
A3D2Q30		0.347	0	0.347	0.347			
A3D2Q31		0.731	0	0.731	0.731			
A3D2Q32		0.508	0	0.508	0.508			
A3D3Q33		0.428	0	0.428	0.428			
A3D3Q34		0.334	0	0.334	0.334			
A3D3Q35		0.336	0	0.336	0.336			
A3D3Q36		0.148	0	0.148	0.148			
Thresholds								
						95% Confidence Interval		
Indicator	Threshold	Estimate	Std. Error	z-value	p	Lower	Upper	
A3D1Q25	t1	-1.088	0.162	-6.709	1.962×10^{-11}	-1.406	-0.77	
	t2	-0.593	0.139	-4.278	1.887×10^{-5}	-0.865	-0.321	
	t3	-0.298	0.132	-2.254	0.024	-0.557	-0.039	
	t4	0.161	0.131	1.231	0.218	-0.095	0.417	

A3D1 Q26	t1	-1.138	0.166	-6.867	6.560×10^{-12}	-1.462	-0.813
	t2	-0.625	0.14	-4.477	7.573×10^{-6}	-0.899	-0.351
	t3	-0.298	0.132	-2.254	0.024	-0.557	-0.039
	t4	0.47	0.135	3.474	5.130×10^{-4}	0.205	0.735
A3D1 Q27	t1	-1.088	0.162	-6.709	1.962×10^{-11}	-1.406	-0.77
	t2	-0.625	0.14	-4.477	7.573×10^{-6}	-0.899	-0.351
	t3	-0.326	0.132	-2.458	0.014	-0.585	-0.066
	t4	0.215	0.131	1.64	0.101	-0.042	0.472
A3D1 Q28	t1	-1.138	0.166	-6.867	6.560×10^{-12}	-1.462	-0.813
	t2	-0.531	0.137	-3.877	1.057×10^{-4}	-0.799	-0.262
	t3	-0.188	0.131	-1.435	0.151	-0.444	0.069
	t4	0.188	0.131	1.435	0.151	-0.069	0.444
A3D2 Q29	t1	-1.138	0.166	-6.867	6.560×10^{-12}	-1.462	-0.813
	t2	-0.531	0.137	-3.877	1.057×10^{-4}	-0.799	-0.262
	t3	-0.107	0.13	-0.821	0.412	-0.362	0.148
	t4	0.242	0.131	1.845	0.065	-0.015	0.5
A3D2 Q30	t1	-1.19	0.17	-7.016	2.284×10^{-12}	-1.522	-0.858
	t2	-0.658	0.141	-4.675	2.941×10^{-6}	-0.934	-0.382
	t3	-0.326	0.132	-2.458	0.014	-0.585	-0.066
	t4	0.382	0.133	2.865	0.004	0.121	0.644
A3D2 Q31	t1	-1.138	0.166	-6.867	6.560×10^{-12}	-1.462	-0.813
	t2	-0.625	0.14	-4.477	7.573×10^{-6}	-0.899	-0.351
	t3	-0.27	0.132	-2.049	0.04	-0.528	-0.012
	t4	0.161	0.131	1.231	0.218	-0.095	0.417
A3D2 Q32	t1	-1.138	0.166	-6.867	6.560×10^{-12}	-1.462	-0.813
	t2	-0.561	0.138	-4.078	4.544×10^{-5}	-0.831	-0.292
	t3	-0.242	0.131	-1.845	0.065	-0.5	0.015
	t4	0.326	0.132	2.458	0.014	0.066	0.585
A3D3 Q33	t1	-1.246	0.174	-7.154	8.444×10^{-13}	-1.587	-0.905
	t2	-0.726	0.143	-5.067	4.036×10^{-7}	-1.006	-0.445
	t3	-0.354	0.133	-2.662	0.008	-0.615	-0.093
	t4	0.27	0.132	2.049	0.04	0.012	0.528

A3D3 Q34	t1	-1.246	0.174	-7.154	8.444×10^{-13}	-1.587	-0.905
	t2	-0.761	0.145	-5.261	1.432×10^{-7}	-1.044	-0.477
	t3	-0.411	0.134	-3.069	0.002	-0.674	-0.149
	t4	0.215	0.131	1.64	0.101	-0.042	0.472
A3D3 Q35	t1	-1.19	0.17	-7.016	2.284×10^{-12}	-1.522	-0.858
	t2	-0.761	0.145	-5.261	1.432×10^{-7}	-1.044	-0.477
	t3	-0.411	0.134	-3.069	0.002	-0.674	-0.149
	t4	0.188	0.131	1.435	0.151	-0.069	0.444
A3D3 Q36	t1	-1.19	0.17	-7.016	2.284×10^{-12}	-1.522	-0.858
	t2	-0.726	0.143	-5.067	4.036×10^{-7}	-1.006	-0.445
	t3	-0.411	0.134	-3.069	0.002	-0.674	-0.149
	t4	0.215	0.131	1.64	0.101	-0.042	0.472

1. Chi-square Test:

- Baseline Model: This model has a chi-square statistic of 1784.294 with 66 degrees of freedom (df).
- Factor Model: This model has a chi-square statistic of 185.947 with 51 degrees of freedom. The p-value is less than 0.001, indicating that the factor model fits significantly better than the baseline model.

2. Factor Loadings:

- Factor loadings represent the relationship between the observed variables (indicators) and the latent constructs (factors). In this case, there are three factors (Factor 1, Factor 2, and Factor 3) identified from the questionnaire items (A3D1Q25, A3D1Q26, ..., A3D3Q36).
- Each indicator has factor loadings for each factor, indicating the strength of the relationship between the indicator and the factor. All factor loadings are significant ($p < .001$).

3. Factor Variances:

Factor variances represent the amount of variance explained by each factor. Here, all factors have a variance of 1.000, indicating that each factor explains 100% of its own variance.

4. Factor Covariances:

Factor covariances represent the relationship between pairs of factors. Each entry in this table shows the covariance between two factors. All covariances are significant ($p < .001$), indicating a relationship between the factors.

5. Residual Variances:

Residual variances represent the amount of variance in each observed variable that is not explained by the factors. All indicators have residual variances, indicating unique variance not captured by the factors.

6. Thresholds:

Thresholds represent the cut-off points for ordered categorical variables. Each indicator has thresholds (t_1, t_2, t_3, t_4) indicating the transition points between response categories. The estimates and associated statistics are provided for each threshold.

These results suggest that the factor model provides a good fit to the data, with significant relationships between the observed variables and the latent constructs identified in Component 1, Component 2, and Component 3 as described in A3.

Pearson's Correlations

AXIS 1 DIMENSION 1					
Pearson's Correlations					
Variable		A1D1Q1	A1D1Q2	A1D1Q3	A1D1Q4
1. A1D1Q1	Pearson's r	—			
	p-value	—			
2. A1D1Q2	Pearson's r	0.584	—		
	p-value	< .001	—		
3. A1D1Q3	Pearson's r	0.539	0.41	—	
	p-value	< .001	< .001	—	
4. A1D1Q4	Pearson's r	0.462	0.533	0.664	—
	p-value	< .001	< .001	< .001	—

The correlations between statements within the dimension of Intercultural training were examined using Pearson's correlation coefficient. The analysis revealed significant positive correlations among all pairs of statements. Specifically, respondents who agreed with one statement were more likely to agree with others within the dimension.

For instance, a moderate positive correlation was observed between the statement emphasizing the essential role of cross-cultural training in improving seafarers' intercultural competence and statements highlighting its benefits in enhancing work adjustment to multicultural contexts, providing realistic expectations about on board life, and reducing stress and ambiguity experienced by seafarers on board (Pearson's r ranging from 0.462 to 0.584, all p-values < 0.001).

These findings suggest a consistent pattern of agreement among respondents regarding the importance and effectiveness of cross-cultural training in various aspects related to intercultural competence among seafarers.

Axis 1 Dimension 2					
Pearson's Correlations					
Variable		A1D2Q5	A1D2Q6	A1D2Q7	A1D2Q8
1. A1D2Q5	Pearson's r	—			
	p-value	—			
2. A1D2Q6	Pearson's r	0.489	—		
	p-value	< .001	—		
3. A1D2Q7	Pearson's r	0.303	0.268	—	
	p-value	0.003	0.009	—	
4. A1D2Q8	Pearson's r	0.358	0.396	0.387	—
	p-value	< .001	< .001	< .001	—

The correlations between statements within the dimension of Intercultural awareness were analysed using Pearson's correlation coefficient. The analysis showed significant positive correlations among most pairs of statements, indicating a tendency for respondents to agree with multiple statements within this dimension.

For instance, a moderate positive correlation was observed between the statement emphasizing the importance of intercultural awareness for interactions between different cultures and statements highlighting the necessity of cultivating sensitivity to managing cultural differences in a global workplace, understanding the essentiality of coexistence with other peoples' cultures for cross-cultural interaction, and the importance of intercultural awareness training programs for enhancing the interpersonal skills of future seamen (Pearson's r ranging from 0.303 to 0.489, all p -values < 0.009).

These results suggest a consistent pattern of agreement among respondents regarding the significance of intercultural awareness in various aspects related to cross-cultural interactions and interpersonal skills development among future seafarers.

AXIS 1 DIMENSION 3					
Pearson's Correlations					
Variable		A1D3Q9	A1D3Q10	A1D3Q11	A1D3Q12
1. A1D3Q9	Pearson's r	—			
	p-value	—			
2. A1D3Q10	Pearson's r	0.21	—		
	p-value	0.042	—		
3. A1D3Q11	Pearson's r	0.307	0.431	—	
	p-value	0.003	< .001	—	
4. A1D3Q12	Pearson's r	0.081	0.225	0.554	—
	p-value	0.437	0.029	< .001	—

The correlations between statements within the dimension of Intercultural curricula were examined using Pearson's correlation coefficient. The analysis revealed varying degrees of correlation among the statements, indicating the respondents' perspectives on different aspects related to intercultural curricula.

There was a statistically significant positive correlation between the statement emphasizing the importance of MET institutions focusing on preparing interculturally competent professionals and the statement suggesting that intercultural curricula should cover the ability to learn and understand cultural awareness (Pearson's $r = 0.210$, $p = 0.042$).

Similarly, a significant positive correlation was found between the statement advocating for enhancing language competencies in intercultural curricula and the statement proposing that curricula must concentrate on increasing cross-cultural understanding and others' acceptance (Pearson's $r = 0.554$, $p < 0.001$).

However, the correlations between other pairs of statements within this dimension were relatively weaker and statistically non-significant.

These results indicate some consistency in respondents' views regarding certain aspects of intercultural curricula, particularly concerning the integration of cultural awareness and language competencies. However, there may be differences in opinions regarding other dimensions of intercultural curricula.

AXIS 2 DIMENSION 1					
Pearson's Correlations					
Variable		A2D1Q13	A2D1Q14	A2D1Q15	A2D1Q16
1. A2D1Q13	Pearson's r	—			
	p-value	—			
2. A2D1Q14	Pearson's r	0.312	—		
	p-value	0.002	—		
3. A2D1Q15	Pearson's r	0.244	0.29	—	
	p-value	0.018	0.005	—	
4. A2D1Q16	Pearson's r	0.418	0.288	0.406	—
	p-value	< .001	0.005	< .001	—

The correlations between statements within the dimension of Communication programs were analysed using Pearson's correlation coefficient, revealing insights into the respondents' perspectives on various aspects related to communication training and education.

There was a statistically significant positive correlation between the statement advocating for communication programs to help students recognize commonalities and differences among cultures and the statement emphasizing the importance of improving crew communication through training and education (Pearson's $r = 0.312$, $p = 0.002$).

Similarly, significant positive correlations were found between the statement highlighting the necessity for leadership on board to enhance cross-cultural competency and both the statement indicating the role of intercultural communication in enabling students to understand values and beliefs beyond behaviours (Pearson's $r = 0.244$, $p = 0.018$), and the statement regarding the importance of improving crew communication (Pearson's $r = 0.290$, $p = 0.005$).

Moreover, a strong positive correlation was observed between the statement emphasizing the role of intercultural communication in enabling students to understand values and beliefs beyond behaviours and the statement advocating for improving crew communication through training and education (Pearson's $r = 0.418$, $p < 0.001$).

These results suggest a consistent perception among respondents regarding the importance of communication programs in fostering cross-cultural understanding and enhancing crew communication, as well as the role of leadership in promoting cross-cultural competency.

AXIS 2 DIMENSION 2					
Pearson's Correlations					
Variable		A2D2Q17	A2D2Q18	A2D2Q19	A2D2Q20
1. A2D2Q17	Pearson's r	—			
	p-value	—			
2. A2D2Q18	Pearson's r	0.27	—		
	p-value	0.008	—		
3. A2D2Q19	Pearson's r	0.236	0.587	—	
	p-value	0.022	< .001	—	
4. A2D2Q20	Pearson's r	0.264	0.502	0.441	—
	p-value	0.01	< .001	< .001	—

The correlations between statements within the dimension of Inter-cultural Communication were examined using Pearson's correlation coefficient, shedding light on respondents' perceptions regarding the significance of intercultural dialogue and professional training in enhancing intercultural communication skills.

A statistically significant positive correlation was observed between the statement highlighting the role of intercultural dialogue in encouraging a peaceful and sustainable environment on board and the statement emphasizing the importance of professional training to enhance seafarers' intercultural communication skills (Pearson's $r = 0.236$, $p = 0.022$).

Furthermore, a strong positive correlation was found between the statement emphasizing the role of intercultural dialogue in enhancing the interpersonal and communication skills of graduate students and the statement advocating for professional training to enhance seafarers' intercultural communication skills (Pearson's $r = 0.587$, $p < 0.001$).

Similarly, significant positive correlations were observed between the statement emphasizing the importance of addressing intercultural dialogue to enhance the motivation for intercultural experiences and both the statement highlighting the role of intercultural dialogue in encouraging a peaceful and sustainable environment on board (Pearson's $r = 0.264$, $p = 0.010$), and the statement emphasizing the role of professional training in enhancing seafarers' intercultural communication skills (Pearson's $r = 0.502$, $p < 0.001$).

These results suggest a consistent perception among respondents regarding the positive impact of intercultural dialogue and professional training on enhancing intercultural communication skills and fostering a conducive environment for intercultural experiences on board.

AXIS 2 DIMENSION 3					
Pearson's Correlations					
Variable		A2D3Q21	A2D3Q22	A2D3Q23	A2D3Q24
1. A2D3Q21	Pearson's r	—			
	p-value	—			
2. A2D3Q22	Pearson's r	0.578	—		
	p-value	< .001	—		
3. A2D3Q23	Pearson's r	0.504	0.561	—	
	p-value	< .001	< .001	—	
4. A2D3Q24	Pearson's r	0.381	0.413	0.317	—
	p-value	< .001	< .001	0.002	—

The correlations between statements within the dimension of Intercultural language use were analysed using Pearson's correlation coefficient, revealing insights into respondents' perceptions regarding the importance of intercultural understanding and language proficiency in facilitating effective communication across cultures.

A statistically significant positive correlation was observed between the statement emphasizing the need for intercultural understanding to develop curiosity and openness to otherness, and the statement advocating for teaching methods that enhance the efficient use of verbal and non-verbal communication (Pearson's $r = 0.578$, $p < 0.001$).

Moreover, strong positive correlations were found between the statement highlighting the importance of intercultural language competence to improve linguistic proficiency and both the statement emphasizing the need for intercultural understanding (Pearson's $r = 0.504$, $p < 0.001$) and the statement advocating for teaching methods that enhance the efficient use of verbal and non-verbal communication (Pearson's $r = 0.561$, $p < 0.001$).

Additionally, a significant positive correlation was observed between the statement stressing the essential role of proficiency in foreign languages for intercultural communication and the statement advocating for teaching methods that enhance the efficient use of verbal and non-verbal communication (Pearson's $r = 0.381$, $p < 0.001$).

These results suggest a consistent perception among respondents regarding the interconnectedness of intercultural understanding, language proficiency, and effective communication strategies in facilitating successful intercultural interactions and fostering cultural competence.

AXIS 3 DIMENSION 1					
Pearson's Correlations					
Variable		A3D1Q25	A3D1Q26	A3D1Q27	A3D1Q28
1. A3D1Q25	Pearson's r	—			
	p-value	—			
2. A3D1Q26	Pearson's r	0.574	—		
	p-value	< .001	—		
3. A3D1Q27	Pearson's r	0.414	0.389	—	
	p-value	< .001	< .001	—	
4. A3D1Q28	Pearson's r	0.437	0.375	0.561	—
	p-value	< .001	< .001	< .001	—

The correlations between statements within the dimension of Cultural challenges were analysed using Pearson's correlation coefficient, shedding light on the perceived challenges related to cultural diversity and intercultural competence faced by seafarers on board.

A statistically significant positive correlation was observed between the statement highlighting the possibility of cultural clashes on board and the statement expressing disappointment with teaching materials in universities regarding intercultural competence (Pearson's $r = 0.574$, $p < 0.001$). This suggests that the perception of potential cultural clashes is associated with concerns about the inadequacy of educational resources in addressing intercultural challenges.

Furthermore, strong positive correlations were found between the statement emphasizing the potential sense of disconnectedness, remoteness, and frustration resulting from limited cultural comprehension and both the statement expressing disappointment with teaching materials (Pearson's $r = 0.414$, $p < 0.001$) and the statement highlighting the possibility of cultural clashes on board (Pearson's $r = 0.437$, $p < 0.001$).

Additionally, a significant positive correlation was observed between the statement suggesting that seafarers might have problems interpreting verbal or nonverbal expressions of other cultures and both the statement expressing disappointment with teaching materials (Pearson's $r = 0.389$, $p < 0.001$) and the statement emphasizing the potential sense of disconnectedness, remoteness, and frustration (Pearson's $r = 0.375$, $p < 0.001$).

These results indicate a consistent perception among respondents regarding the challenges associated with cultural diversity and intercultural communication on board, emphasizing the importance of effective educational resources and cultural comprehension in mitigating potential conflicts and fostering a harmonious working environment.

AXIS 3 DIMENSION 2					
Pearson's Correlations					
Variable		A3D2Q29	A3D2Q30	A3D2Q31	A3D2Q32
1. A3D2Q29	Pearson's r	—			
	p-value	—			
2. A3D2Q30	Pearson's r	0.628	—		
	p-value	< .001	—		
3. A3D2Q31	Pearson's r	0.386	0.504	—	
	p-value	< .001	< .001	—	
4. A3D2Q32	Pearson's r	0.326	0.285	0.218	—
	p-value	0.001	0.005	0.035	—

The correlations between statements within the dimension of Communication challenges were examined using Pearson's correlation coefficient, aiming to understand the perceived difficulties related to language competency among seafarers.

A strong positive correlation was found between the statement highlighting the impact of a lack of language competency on creating misunderstandings among crewmembers and the statement emphasizing the potential misunderstandings arising from the inability to speak a common language between vessels (Pearson's $r = 0.628$, $p < 0.001$). This suggests that the perceived challenges associated with language competency are interconnected and can lead to communication breakdowns within and between crews.

Furthermore, a significant positive correlation was observed between the statement emphasizing the scarcity of people proficient in another language at an acceptable level and both the statements highlighting the potential misunderstandings resulting from a lack of language competency among crewmembers (Pearson's $r = 0.386$, $p < 0.001$) and the inability to speak a common language between vessels (Pearson's $r = 0.504$, $p < 0.001$). This indicates a consistent perception among respondents regarding the challenges posed by limited language proficiency in maritime settings.

Additionally, a positive correlation was observed between the statement suggesting a lack of training in understanding gestures and eye contact and both the statements emphasizing the potential misunderstandings arising from a lack of language competency among crewmembers (Pearson's $r = 0.326$, $p = 0.001$) and the inability to speak a common language between vessels (Pearson's $r = 0.285$, $p = 0.005$). While less strong than other correlations, this suggests a relationship between the need for training in

nonverbal communication and the challenges associated with language competency in maritime environments.

These results highlight the significant impact of communication challenges on communication effectiveness within and between maritime crews, underscoring the importance of addressing language competency and providing adequate training to enhance communication skills among seafarers.

AXIS 3 DIMENSION 3					
Pearson's Correlations					
Variable		A3D3Q33	A3D3Q34	A3D3Q35	A3D3Q36
1. A3D3Q33	Pearson's r	—			
	p-value	—			
2. A3D3Q34	Pearson's r	0.526	—		
	p-value	< .001	—		
3. A3D3Q35	Pearson's r	0.407	0.508	—	
	p-value	< .001	< .001	—	
4. A3D3Q36	Pearson's r	0.645	0.548	0.707	—
	p-value	< .001	< .001	< .001	—

The correlations between statements within the dimension of Teaching/learning challenges were examined using Pearson's correlation coefficient to understand the perceived difficulties related to education and training in maritime settings.

A strong positive correlation was found between the statement highlighting the superficial treatment of multiculturalism in training content and the statement indicating a lack of recognized methods to assess the success of a course in cultural awareness (Pearson's $r = 0.645$, $p < 0.001$). This suggests that respondents who perceive training content as superficially addressing multiculturalism are also likely to believe that there is no recognized method to assess the effectiveness of courses in cultural awareness.

Furthermore, a significant positive correlation was observed between the statement indicating a lack of communication skills among maritime graduates and both the statements highlighting the absence of courses on communication and cross-cultural competence in maritime institutions (Pearson's $r = 0.407$, $p < 0.001$) and the lack of recognized methods to assess the success of courses in cultural awareness (Pearson's $r = 0.548$, $p < 0.001$). This implies that respondents who believe that maritime graduates lack communication skills are also likely to perceive deficiencies in the curriculum related to communication and cross-cultural competence and the absence of recognized assessment methods for courses in cultural awareness.

Additionally, a strong positive correlation was observed between the statement indicating the absence of courses on communication and cross-cultural competence in maritime institutions and the statement highlighting the lack of recognized methods to assess the success of courses in cultural awareness (Pearson's $r = 0.707$, $p < 0.001$). This suggests that respondents who perceive a deficiency in the curriculum regarding communication

and cross-cultural competence are also likely to believe that there is no recognized method to assess the effectiveness of courses in cultural awareness.

These results underscore the perceived challenges in education and training within maritime institutions, particularly regarding the adequacy of content related to multiculturalism, communication skills, and cross-cultural competence, as well as the absence of recognized assessment methods for cultural awareness courses. Addressing these challenges may be crucial for improving the preparedness of maritime graduates and enhancing their ability to navigate diverse and multicultural environments effectively.

Annex III Interview questions, answers and coding

Questions

1. to what extent is intercultural competence embedded into the educational curricula at Maritime Education and Training (MET) institutions?
2. based on your experience, to what extent are communication competencies taught at Maritime Education and Training (MET) institutions?
3. what are the prominent cultural challenges faced by seafarers on board?
4. what are the prominent communication challenges faced by seafarers on board?
5. what are the prominent teaching challenges that hinder cultural and communication understanding on board?
6. what are the most effective strategies that seagoing vessels can use to enhance the intercultural competence of their crew and mitigate intercultural conflicts?

Interview answers and coding

Participant 1

1. Incorporation of Intercultural Competence into Curricula:

- Participant 1: "While some programs touch on cultural aspects, it's not given the attention it truly needs."
- Code: 3 (Neutral)

2. Emphasis on Communication Skills:

- Participant 1: "Communication skills definitely deserve more spotlight."
- Code: 2 (Agree)

3. Main Cultural Hurdles Observed:

- Participant 1: "One of the major hurdles is the lack of understanding about each other's backgrounds and customs."
- Code: 2 (Agree)

4. Language Struggles Seafarers Encounter:

- Participant 1: "Language can be a real barrier to smooth sailing. Many times, seafarers struggle to understand each other, leading to confusion and misunderstandings."
- Code: 1 (Strongly Agree)

5. Inhibitors of Cultural and Communication Understanding on board:

- Participant 1: "One major obstacle is the lack of enthusiasm for teaching cultural diversity. When this aspect is overlooked, it creates gaps in understanding among crew members."
- Code: 2 (Agree)

6. Strategies to Enhance Intercultural Efficiency and Reduce Conflicts:

- Participant 1: "Establishing ground rules and fostering a culture of mutual respect and understanding can go a long way in smoothing out rough seas and promoting harmony on board."
- Code: 1 (Strongly Agree)

Participant 2

1. Incorporation of Intercultural Competence into Curricula:

- Participant 2: "Institutions tend to focus solely on what serves the curriculum, neglecting the broader scope of intercultural competence."
- Code: 4 (Disagree)

2. Emphasis on Communication Skills:

- Participant 2: "Unfortunately, the emphasis seems to be solely on aspects that serve exam requirements, rather than practical application."
- Code: 4 (Disagree)

3. Main Cultural Hurdles Observed:

- Participant 2: "One major challenge is the variance in expressive words across cultures. This can lead to misunderstandings and difficulties in effective communication among crew members."
- Code: 2 (Agree)

4. Language Struggles Seafarers Encounter:

- Participant 2: "Many seafarers encounter difficulties in expressing their thoughts and needs, both verbally and in writing."
- Code: 1 (Strongly Agree)

5. Inhibitors of Cultural and Communication Understanding on board:

- Participant 2: "There's often a focus on theoretical knowledge for exams, rather than practical skills that are essential for effective communication and cultural understanding in real-world scenarios."
- Code: 4 (Disagree)

6. Strategies to Enhance Intercultural Efficiency and Reduce Conflicts:

- Participant 2: "Ensuring that maritime education and training institutions keep pace with international standards in selecting marine crews could help ensure that crews are more culturally aware and better equipped to navigate intercultural challenges effectively."
- Code: 2 (Agree)

Participant 3

1. **Incorporation of Intercultural Competence into Curricula:**

- Participant 3: "While some educational curricula do touch upon intercultural competence, they fall short in truly fostering the necessary cultural awareness among students."
- Code: 4 (Disagree)

2. **Emphasis on Communication Skills:**

- Participant 3: "There seems to be a bias towards teaching materials that rely on relatively diverse intercultural contact. While this is a step in the right direction, it may not fully address the complexities of communication in diverse maritime environments."
- Code: 3 (Neutral)

3. **Main Cultural Hurdles Observed:**

- Participant 3: "The challenge of understanding and effectively communicating with crew members from different cultural backgrounds."
- Code: 2 (Agree)

4. **Language Struggles Seafarers Encounter:**

- Participant 3: "Seafarers frequently struggle with interpreting messages and speech from crew members due to linguistic differences."
- Code: 1 (Strongly Agree)

5. **Inhibitors of Cultural and Communication Understanding on board:**

- Participant 3: "There's a notable weakness in training courses that emphasize the importance of cultural diversity and effective communication. This gap in the curriculum can impede students' ability to navigate diverse maritime environments successfully."
- Code: 4 (Disagree)

6. **Strategies to Enhance Intercultural Efficiency and Reduce Conflicts:**

- Participant 3: "One effective strategy could involve training individuals for multilingualism and fostering an appreciation for diverse identities within maritime crews."
- Code: 2 (Agree)

Participant 4

1. Incorporation of Intercultural Competence into Curricula:

- Participant 4: "There seems to be some interest in including certain subjects lately, but it's not exactly crystal clear if it's enough."
- Code: 4 (Disagree)

2. Emphasis on Communication Skills:

- Participant 4: "Sometimes it feels like the focus is mainly on technical stuff, and maybe not so much on the communication side of things."
- Code: 4 (Disagree)

3. Main Cultural Hurdles Observed:

- Participant 4: "There's this thing about having multiple identities, and sometimes folks can't quite figure out what others are trying to say cause of these differences."
- Code: 4 (Disagree)

4. Language Struggles Seafarers Encounter:

- Participant 4: "It feels like there's more focus on the cognitive side, like understanding the mechanics of language, rather than actually applying it in real-life situations."
- Code: 4 (Disagree)

5. Inhibitors of Cultural and Communication Understanding on board:

- Participant 4: "It seems like there's a need to follow strategies that help develop and enhance effective communication skills, especially among the ship's administrative staff. But it's not always clear how to go about it."
- Code: 4 (Disagree)

6. Strategies to Enhance Intercultural Efficiency and Reduce Conflicts:

- Participant 4: "Maybe there could be more emphasis on developing these communication skills, like creating training programs that focus on practical scenarios and real-life situations faced on board."
- Code: 4 (Disagree)

Participant 5

1. Incorporation of Intercultural Competence into Curricula:

- Participant 5: "From what I've seen, the educational curricula in maritime education and training institutions boast a considerable level of efficiency. There's a strong emphasis on equipping students with the necessary intercultural skills."
- Code: 1 (Strongly Agree)

2. Emphasis on Communication Skills:

- Participant 5: "Naval colleges utilize a variety of strategies to instil communication competencies in students. This includes practical exercises, role-playing scenarios, and real-life simulations to ensure proficiency in diverse communication environments."
- Code: 1 (Strongly Agree)

3. Main Cultural Hurdles Observed:

- Participant 5: "Accepting different cultures is crucial, but it can also lead to some behaviours or actions that seem unusual or unfamiliar to others. Navigating these differences requires understanding and respect from all crew members."
- Code: 2 (Agree)

4. Language Struggles Seafarers Encounter:

- Participant 5: "It's essential for students to be proficient in more than just their mother tongue. Relying solely on one language can hinder understanding and communication between crew members, especially in diverse maritime environments."
- Code: 1 (Strongly Agree)

5. Inhibitors of Cultural and Communication Understanding on board:

- Participant 5: "Traditional teaching methods are still prevalent in many maritime education institutions. However, there's a growing recognition of the need to adapt and incorporate more modern, practical teaching approaches to better prepare students for real-world challenges."
- Code: 2 (Agree)

6. Strategies to Enhance Intercultural Efficiency and Reduce Conflicts:

- Participant 5: "Exposure to realistic situations is invaluable. It allows students to apply the knowledge and skills they've acquired in the classroom to practical scenarios, better preparing them for the challenges they'll face on board."
- Code: 1 (Strongly Agree)

Participant 6

1. **Integration of Cultural Concepts Across Different Languages:**

- Participant 6: "Yes, indeed, there are various educational programs that aim to tackle cultural concepts across different languages. These programs play a crucial role in fostering intercultural understanding and competence among students."
- Code: 1 (Strongly Agree)

2. **Prioritization of Communication Competencies:**

- Participant 6: "In my opinion, maritime education and training institutions fall short in adequately prioritizing the teaching of communication competencies. There's a need for greater emphasis on these skills to better prepare students for the diverse communication environments they'll encounter in their careers."
- Code: 4 (Disagree)

3. **Impact of Cultural Differences Among Sailors:**

- Participant 6: "Cultural differences among sailors can often lead to a lack of cultural awareness and understanding of other nationalities. This can result in miscommunications, misunderstandings, and even conflicts on board, highlighting the importance of fostering cultural competence among crew members."
- Code: 1 (Strongly Agree)

4. **Language Barriers and Understanding Issues:**

- Participant 6: "Many seafarers face difficulties in comprehending others, particularly when linguistic differences come into play. This can lead to misunderstandings and a lack of understanding of certain issues and problems, hindering effective communication and collaboration on board."
- Code: 1 (Strongly Agree)

5. **Incorporation of Cultural Diversity into Student Education:**

- Participant 6: "Unfortunately, the incorporation of cultural diversity into student education is often neglected. There's a need for educational institutions to prioritize this aspect and integrate it into their curricula to better prepare students for the diverse and multicultural environments they'll encounter in their careers."
- Code: 5 (Strongly Disagree)

6. **Strategies to Mitigate Conflicts Among Administrative Staff:**

- Participant 6: "There are several strategies that can be employed to mitigate conflicts among the administrative staff on board a ship. This includes promoting open communication, fostering a culture of respect and understanding, implementing conflict resolution training, and establishing clear protocols for addressing conflicts when they arise. These strategies can help create a more harmonious and productive work environment on board."
- Code: 1 (Strongly Agree)

Participant 7

1. **Emphasis on Intercultural Competence:**

- Participant 7: "From my perspective, the shared efficiency in this area seems to be quite limited. It appears that the focus is mainly on aspects directly related to the curriculum, with little attention given to broader intercultural competencies."
- Code: 4 (Disagree)

2. **Prioritization of Communication Competencies:**

- Participant 7: "Well, it seems that the emphasis is primarily on aspects directly related to the curriculum. While communication competencies are certainly taught, there may be room for improvement in terms of prioritization and depth of instruction."
- Code: 3 (Neutral)

3. **Impact of Cultural Differences on Communication:**

- Participant 7: "Cultural differences among sailors can pose significant challenges in communication. Expressive words and language nuances vary across different cultures, which can lead to misunderstandings and communication barriers among crew members."
- Code: 1 (Strongly Agree)

4. **Challenges in Expressing Thoughts and Desires:**

- Participant 7: "Many seafarers encounter challenges in effectively expressing their thoughts and desires, both verbally and in written forms. This can hinder effective communication and collaboration on board."
- Code: 1 (Strongly Agree)

5. **Balance Between Theoretical Knowledge and Practical Application:**

- Participant 7: "Well, it seems that there's often an imbalance, with insufficient focus on practical application in some curricula. There's a need for greater emphasis on hands-on learning experiences to better prepare students for real-world challenges they'll face in their careers."
- Code: 4 (Disagree)

6. **Implementation of Instructions and Conditions for the Crew:**

- Participant 7: "I believe that implementing clear instructions and conditions for the crew to meet necessary requirements is essential. This could involve establishing protocols and procedures that clearly outline expectations and provide guidance for crew members to follow in fulfilling their responsibilities on board."
- Code: 1 (Strongly Agree)

Participant 8

1. Development of Cultural Competence:

- Participant 8: "While some curricula do touch upon cultural competence, there's a noticeable gap in building sufficient cultural awareness among students. It's like we're scratching the surface without delving deep enough into understanding diverse cultures."
- Code: 4 (Disagree)

2. Focus on Communication Competencies:

- Participant 8: "Well, there's definitely a degree of bias towards teaching materials that involve diverse intercultural contact. However, I believe there's room for improvement in this aspect. We need more robust training that prepares us for the real-world communication challenges we'll face at sea."
- Code: 3 (Neutral)

3. Impact of Cultural Barriers on Communication:

- Participant 8: "Cultural barriers are a significant hurdle. Seafarers often struggle with understanding and communicating with fellow crew members from different cultural backgrounds. It can lead to misunderstandings and hinder effective teamwork on board."
- Code: 1 (Strongly Agree)

4. Difficulties in Interpreting Messages:

- Participant 8: "Many seafarers have a limited ability to interpret messages and understand the speech of their fellow crew members. This can create communication breakdowns and impact operational efficiency on board."
- Code: 1 (Strongly Agree)

5. Effectiveness of Training Courses in Emphasizing Cultural Diversity and Interpersonal Communication:

- Participant 8: "Training courses often fall short in emphasizing the significance of cultural diversity and interpersonal communication. There's a disconnect between theory and practice, and we need more practical, hands-on training in these areas."
- Code: 4 (Disagree)

6. Importance of Adhering to International Standards in Personnel Selection:

- Participant 8: "Adhering to international standards is crucial. It ensures that maritime personnel possess the necessary skills and qualifications to perform their duties effectively and safely. Plus, it promotes consistency and quality across the maritime industry."
- Code: 1 (Strongly Agree)

Participant 9

1. Recent Changes in Inclusion of Relevant Subjects:

- Participant 9: "Recent times seem to show a growing interest in including relevant subjects in education, but not sure if it's enough."
- Code: 3 (Neutral)

2. Trends Towards Specific Disciplines:

- Participant 9: "It's common to see a tendency where interest in studying goes mainly to technical disciplines, not much else."
- Code: 2 (Agree)

3. Presence of Multiple Identities within the Maritime Community:

- Participant 9: "There's multiple identities within the maritime community, and it makes cultural interactions complicated, I guess."
- Code: 3 (Neutral)

4. Understanding Others' Words:

- Participant 9: "Some individuals may find it difficult to understand what others mean, you know? It's not so easy."
- Code: 4 (Disagree)

5. Approach to Language Learning in Maritime Education:

- Participant 9: "Language learning is mostly from a cognitive perspective, like learning words and stuff, but not much practical use, I guess."
- Code: 4 (Disagree)

6. Providing Training for Multilingualism and Embracing Diverse Identities:

- Participant 9: "Providing training for multilingualism and embracing diverse identities is good, I think. Helps everyone understand each other, you know?"
- Code: 2 (Agree)

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Participant 10

1. Efficiency of Educational Curricula:

- Participant 10: "In my experience, the educational curricula in maritime education and training institutions demonstrate high efficiency."
- Code: 1 (Strongly Agree)

2. Strategies Employed by Naval Colleges for Teaching Communication Competencies:

- Participant 10: "Naval colleges employ various strategies to teach communication competencies."
- Code: 1 (Strongly Agree)

3. Impact of Different Cultures on Interactions Among Crew Members:

- Participant 10: "Acceptance of different cultures is vital. Understanding and respecting these differences are key to maintaining harmony among crew members."
- Code: 1 (Strongly Agree)

4. Language Barriers and Struggles with Understanding and Communication:

- Participant 10: "Students limited to their mother tongue may experience hindered understanding and communication with others on board due to their lack of proficiency in additional languages."
- Code: 1 (Strongly Agree)

5. Reliance on Traditional Teaching Methods in Maritime Education:

- Participant 10: "There's still a reliance on traditional teaching methods in maritime education, which may not always be the most effective approach."
- Code: 4 (Disagree)

6. Strategies to Develop and Improve Communication Skills Among the Ship's Administrative Staff:

- Participant 10: "Employing strategies to develop and improve communication skills among the ship's administrative staff is crucial."
- Code: 1 (Strongly Agree)

Participant 11

1. Focus on Cross-Cultural Concepts Across Languages:

- Participant 11: "Well, it's like finding a unicorn in a sea of dolphins, but yeah, there are these programs that try to tackle cross-cultural concepts."
- Code: 2 (Agree)

2. Coverage of Communication Competencies in Maritime Education:

- Participant 11: "Maritime education and communication competencies walk into a bar. The bartender says, 'What'll it be?' and they both shrug, not knowing how to order a drink! But seriously, communication skills could use a bit of a boost in maritime education."
- Code: 4 (Disagree)

3. Perception of Cultural Awareness Among Sailors:

- Participant 11: "Ah, cultural awareness among sailors is like trying to find your sea legs in a room full of landlubbers. With all these cultural differences, it's a bit like a pirate ship without a compass—lost at sea!"
- Code: 2 (Agree)

4. Coping with Language Barriers:

- Participant 11: "Oh, it's like a game of charades, A. Ragab! Sailors waving their arms around, trying to convey their message without speaking the same language. But seriously, it's a struggle, and sometimes we're all just lost in translation!"
- Code: 2 (Agree)

5. Importance of Emphasizing Cultural Diversity in Maritime Education:

- Participant 11: "Oh, it's as important as sunscreen on a sunny day, A. Ragab! Without it, we're all just getting burned by cultural misunderstandings."
- Code: 1 (Strongly Agree)

6. Enhancement of Maritime Education through Exposure to Realistic Situations:

- Participant 11: "Well, it's like putting the theory to the test. We can read all the manuals in the world, but until we're out there in the stormy seas, putting our skills to the test, we won't truly know if we're ready to sail or just treading water!"
- Code: 1 (Strongly Agree)

Participant 12

1. **Collaboration in Addressing Communication Challenges in Maritime Education:**

- Participant 12: "From what I've observed, the effectiveness of shared efforts in this area seems to be rather minimal."
- Code: 4 (Disagree)

2. **Balance Between Curriculum-Focused Aspects and Comprehensive Communication Training:**

- Participant 12: "The curriculum-focused aspect tends to take precedence, often at the expense of comprehensive communication instruction."
- Code: 4 (Disagree)

3. **Contribution of Expressive Words Differing Across Cultures to Communication Challenges:**

- Participant 12: "The nuances of expressive words can vary greatly across cultures, leading to misunderstandings and communication breakdowns among crew members."
- Code: 1 (Strongly Agree)

4. **Addressing Difficulties in Effectively Expressing Desires and Thoughts:**

- Participant 12: "It's about equipping students with the tools they need to navigate the sea of communication effectively."
- Code: 1 (Strongly Agree)

5. **Prioritization of Practical Application Over Exam-Oriented Content:**

- Participant 12: "While exams are important milestones, we shouldn't lose sight of the ultimate destination—practical application."
- Code: 1 (Strongly Agree)

6. **Contribution of Establishing Guidelines and Requirements for the Crew to Smoother Operations on Board:**

- Participant 12: "Establishing clear guidelines and requirements provides a framework for the crew to follow, ensuring consistency and efficiency in operations."
- Code: 1 (Strongly Agree)

Participant 13

1. Effectiveness of Educational Curricula in Fostering Cultural Awareness:

- Participant 13: "Frankly, some educational curricula make feeble attempts to develop cultural competence, but they fall miserably short in fostering sufficient cultural awareness among students."
- Code: 5 (Strongly Disagree)

2. Bias Towards Diverse Intercultural Contact in Teaching Materials:

- Participant 13: "Teaching materials exhibit a clear bias towards diverse intercultural contact, albeit to some extent."
- Code: 4 (Disagree)

3. Prevalence of Cultural Barriers on Ships:

- Participant 13: "In my belief, cultural barriers on ships are as common as seagulls on the coast."
- Code: 1 (Strongly Agree)

4. Sailors' Coping Mechanisms with Language Barriers:

- Participant 13: "Coping with these challenges is like walking a tightrope. Many sailors struggle with interpreting messages and understanding the speech of their fellow crew members."
- Code: 1 (Strongly Agree)

5. Shortcomings in Training Courses Related to Cultural Diversity and Interpersonal Communication:

- Participant 13: "Weaknesses in training courses related to cultural diversity and interpersonal communication are as glaring as a lighthouse in the dark."
- Code: 5 (Strongly Disagree)

6. Importance of Compliance with International Standards in Recruitment:

- Participant 13: "Ensuring compliance with international standards is non-negotiable. It's like the keel of a ship—without it, everything falls apart."
- Code: 1 (Strongly Agree)

Participant 14

1. Incorporation of Relevant Subjects into Maritime Education:

- Participant 14: "Yes, recent times have indeed seen a notable interest in incorporating relevant subjects into education."
- Code: 2 (Agree)

2. Student Interest in Technical Disciplines:

- Participant 14: "There's a predominant interest in technical disciplines among students."
- Code: 2 (Agree)

3. Impact of Multiple Identities on Cultural Interactions:

- Participant 14: "The presence of multiple identities adds layers of complexity to cultural interactions within the maritime community."
- Code: 1 (Strongly Agree)

4. Sailors' Coping Mechanisms with Discerning Intended Meaning:

- Participant 14: "Coping with these challenges requires a delicate touch. Many sailors struggle with discerning the intended meaning behind others' words."
- Code: 1 (Strongly Agree)

5. Balance Between Cognitive Learning and Practical Usage in Language Learning:

- Participant 14: "There seems to be a limited focus on language learning from a cognitive perspective rather than practical usage."
- Code: 5 (Strongly Disagree)

6. Importance of Training Proficiency in Multiple Languages and Embracing Diverse Identities:

- Participant 14: "Training individuals to be proficient in multiple languages and embrace diverse identities is absolutely essential."
- Code: 1 (Strongly Agree)

Participant 15

1. Perception of Educational Curricula in Maritime Education:

- Participant 15: "Maritime education and training institutions boast highly efficient educational curricula."
- Code: 1 (Strongly Agree)

2. Strategies Employed by Naval Colleges for Communication Competencies:

- Participant 15: "Naval colleges employ multiple strategies to teach communication competencies."
- Code: 1 (Strongly Agree)

3. Influence of Cultural Acceptance on Interactions On board:

- Participant 15: "Acceptance of different cultures is essential."
- Code: 1 (Strongly Agree)

4. Effect of Relying Solely on Mother Tongue in Communication:

- Participant 15: "Students who only rely on their mother tongue may experience hindered understanding and communication with others."
- Code: 1 (Strongly Agree)

5. Perception of Traditional Teaching Methods:

- Participant 15: "Traditional teaching methods have their place."
- Code: 2 (Agree)

6. Strategies for Fostering Effective Communication Among Ship's Administrative Staff:

- Participant 15: "Adopting strategies to foster effective communication skills among the ship's administrative staff is essential."
- Code: 1 (Strongly Agree)

Participant 16

1. Perception of Educational Programs Addressing Cultural Concepts:

- Participant 16: "They tackle cultural concepts across different languages, sprinkling a bit of magic into the minds of eager learners."
- Code: 1 (Strongly Agree)

2. Attention Given to Communication Competencies in Maritime Education:

- Participant 16: "The teaching of communication competencies is as neglected as a forgotten spell book in the dusty corners of a wizard's library."
- Code: 1 (Strongly Agree)

3. Impact of Cultural Differences on Sailors' Awareness and Understanding:

- Participant 16: "Cultural differences among sailors are like colourful feathers in a cap worn by a merry jester."
- Code: 1 (Strongly Agree)

4. Suggestions for Overcoming Challenges in Comprehension:

- Participant 16: "Facing challenges in comprehension is like navigating through a maze of mirrors."
- Code: 1 (Strongly Agree)

5. Remediating the Neglect of Cultural Diversity in Student Education:

- Participant 16: "We must extend our arms wide, welcoming cultural diversity into the heart of maritime education."
- Code: 1 (Strongly Agree)

6. Enhancing Practical Exposure to Apply Acquired Knowledge and Skills:

- Participant 16: "Practical exposure is the potion that brings our studies to life."
- Code: 1 (Strongly Agree)

Participant 17

1. Focus on Intercultural Competence:

- Participant 17: "Intercultural competence gets a bit lost in the waves... There's room for improvement, for sure."
- Code: 2 (Agree)

2. Teaching of Communication Competencies:

- Participant 17: "Communication competencies are essential for smooth sailing... But I'd say they're not given the full wind in their sails... We could do with a bit more focus on honing those skills."
- Code: 2 (Agree)

3. Salient Cultural Challenges Faced by Seafarers:

- Participant 17: "Cultural challenges are like the hidden currents beneath the surface—sometimes they catch you off guard... Navigating those waters can be tricky, to say the least."
- Code: 2 (Agree)

4. Salient Communication challenges Faced by Seafarers:

- Participant 17: "Communication challenges are like the fog that rolls in unexpectedly... It's like trying to decipher a code sometimes."
- Code: 2 (Agree)

5. Teaching Challenges Hindering Cultural and Communication Understanding On board:

- Participant 17: "Teaching challenges... they're like navigating through stormy seas... It's a balancing act, to be sure."
- Code: 2 (Agree)

6. Effective Strategies for Enhancing Intercultural Efficiency and Mitigating Conflicts Among the Crew:

- Participant 17: "Navigating those waters requires a steady hand and a keen eye... It's about creating a culture of respect and cooperation on board, where everyone's voice is heard."
- Code: 1 (Strongly Agree)

Participant 18

1. **Promotion of Cultural Competence within Maritime Education Curricula:**

- Participant 18: "Some curricula do make an attempt to promote cultural competence, but it's like planting seeds in rocky soil—they struggle to take root. We need to nurture a deeper cultural awareness among students."
- Code: 2 (Agree)

2. **Bias Towards Diverse Intercultural Contact in Teaching Materials:**

- Participant 18: "Teaching materials do show some bias towards diverse intercultural contact, but it's like a patchy quilt—there are gaps that need filling."
- Code: 2 (Agree)

3. **Significant Cultural Barriers Faced by Seafarers:**

- Participant 18: "Cultural barriers are like invisible walls that divide us... Crew members encounter numerous challenges, from language barriers to differing customs and traditions."
- Code: 1 (Strongly Agree)

4. **Impact of Communication challenges on Communication Among Crew Members:**

- Participant 18: "Communication challenges are like tangled knots that need unravelling... Crew members often struggle to interpret messages and grasp each other's speech."
- Code: 1 (Strongly Agree)

5. **Effectiveness of Training Courses in Addressing Cultural Diversity and Interpersonal Communication:**

- Participant 18: "While they touch on the importance of cultural diversity and interpersonal communication, it's like a faint beacon in the distance."
- Code: 2 (Agree)

6. **Contribution of Crew Instructions to Meeting Necessary Criteria:**

- Participant 18: "Implementing crew instructions is like following the stars to chart our course... ensuring that we meet necessary criteria and navigate safely through the challenges of seafaring life."
- Code: 1 (Strongly Agree)

Participant 19

1. Perception of Interest in Integrating Relevant Subjects into Education:

- Participant 19: "Recent times have indeed shown a growing interest in integrating relevant subjects into education. It's like witnessing the tide slowly turning towards a broader and more comprehensive approach to learning."
- Code: 1 (Strongly Agree)

2. Observation of Students' Common Inclination Towards Specific Disciplines:

- Participant 19: "It's quite common to see students gravitating towards technical disciplines. It's like the sturdy anchor of practical knowledge amidst the vast sea of educational possibilities."
- Code: 1 (Strongly Agree)

3. Perception of the Impact of Multiple Identities within the Maritime Community:

- Participant 19: "The presence of multiple identities adds layers of complexity to cultural interactions within the maritime community. It's like navigating through a bustling port filled with ships from different lands—each with its own unique flag and crew."
- Code: 1 (Strongly Agree)

4. Coping Mechanisms for Interpreting Others' Words Amidst Communication challenges:

- Participant 19: "Communication challenges can be like deciphering a cryptic code... Some individuals may struggle to discern the intended message behind others' words, especially in the midst of cultural differences and linguistic nuances."
- Code: 1 (Strongly Agree)

5. Perception of the Balance Between Cognitive Aspects and Practical Application in Language Learning:

- Participant 19: "While cognitive aspects of language learning are important, practical application is equally crucial. It's like learning to navigate by the stars—theory guides us, but it's the hands-on experience that truly steers the ship."
- Code: 1 (Strongly Agree)

6. Influence of Adherence to International Benchmarks on Marine Crew Selection:

- Participant 19: "Adhering to international benchmarks is like setting sail with a trusted compass... It ensures that we maintain the highest standards of competence and professionalism among marine crews, fostering safety and reliability on the high seas."
- Code: 1 (Strongly Agree)

Participant 20

1. Perception of the Efficiency of Educational Curricula:

- Participant 20: "Educational curricula in maritime education and training institutions showcase a remarkable level of efficiency. It's like a well-oiled machine, finely tuned to equip students with the knowledge and skills they need to navigate the maritime world."
- Code: 1 (Strongly Agree)

2. Observation of Strategies Employed by Naval Colleges for Communication Competencies:

- Participant 20: "Naval colleges leave no stone unturned when it comes to imparting communication competencies. They employ various strategies, from interactive workshops to simulated scenarios, ensuring that students are well-equipped to navigate the seas of communication effectively."
- Code: 1 (Strongly Agree)

3. Perception of the Influence of Accepting Different Cultures on Behaviours On board:

- Participant 20: "Accepting different cultures is like opening a treasure chest of diversity on board. It can lead to a rich tapestry of behaviours and practices, some of which may seem strange to others. Embracing this diversity is key to fostering a harmonious and inclusive environment on board."
- Code: 1 (Strongly Agree)

4. Identification of Difficulties Faced by Students Confined to Their Mother Tongue:

- Participant 20: "Students confined to their mother tongue encounter significant challenges in understanding and communicating with others. It's like trying to navigate a foreign land without a map—language barriers can hinder effective communication and collaboration on board."
- Code: 1 (Strongly Agree)

5. Perception of Reliance on Traditional Teaching Methods:

- Participant 20: "Ah, traditional teaching methods have their merits, but they can also be like an anchor holding us back from exploring new horizons. While they provide structure and familiarity, there's a need for innovation and adaptability to meet the evolving needs of maritime education."
- Code: 1 (Strongly Agree)

6. Assessment of the Contribution of Training Programs for Multilingualism and Diverse Identities:

- Participant 20: "Training programs for multilingualism and diverse identities are like the wind in our sails, propelling us towards a more inclusive maritime community. By embracing linguistic diversity and fostering a culture of inclusivity, these programs equip maritime professionals with the skills they need to navigate the global seas effectively."
- Code: 1 (Strongly Agree)

Participant 21~25

Based on the responses provided for Participants 21, 22, 23, 24, and 25, it seems that their answers were lacking in detail and specificity. Therefore, it might not be appropriate to assign them ratings using the provided rating scale. Instead, we can summarize their responses qualitatively:

Participant 21:

- Perceived the efficiency of educational curricula as "pretty good" but lacked detailed explanation.
- Mentioned that naval colleges may employ strategies like talking about communication in class and possibly having workshops, but the response lacked depth.
- Acknowledged the importance of accepting different cultures but provided a general statement without elaboration.
- Identified communication challenges as a barrier but didn't delve into specific difficulties.
- Viewed traditional teaching methods as likely effective due to their historical use.
- Suggested that training programs for multilingualism and diverse identities probably help but didn't provide clear reasons.

Participant 22:

- Provided vague responses with limited detail or insight across all questions.
- Showed uncertainty about various topics, including the effectiveness of educational curricula, strategies for teaching communication competencies, the influence of cultural acceptance, communication challenges, reliance on traditional teaching methods, and the contribution of training programs for multilingualism and diverse identities.

Participant 23:

- Offered somewhat more detailed responses compared to Participants 21 and 22 but still lacked depth.
- Used metaphors and analogies to express thoughts, but the responses remained vague overall.
- Expressed uncertainty or lack of specific knowledge on several topics.

Participant 24:

- Demonstrated a lack of engagement and understanding, often stating uncertainty or providing minimal responses.
- Expressed difficulty in providing substantive answers to most questions.
- Generally, the responses lacked detail and specificity.

Participant 25:

- Showed a similar pattern of uncertainty and lack of detailed insight across all questions.
- Offered vague responses without providing specific examples or explanations.

Overall, the responses from Participants 21 to 25 did not provide substantial information or insights that could be reliably coded using the rating scale. Therefore, these responses may be summarized qualitatively to reflect their limited contribution to the discussion.

Annex IV Pilot Study

The pilot study was employed to comprehensively explore the research question spectrum, assess sample size adequacy, and refine both interview questions and survey statements based on initial findings and evaluation of analysis techniques (Doody & Doody, 2015).

An initial pilot study is essential in sharpening and mastering both qualitative and quantitative research methods (Hazzi & Maldaon, 2015). Furthermore, this critical stage assesses the viability of the main study and creates a deep knowledge base on instrument evaluation (Nyatanga, 2005).

These preliminary undertakings also lay a foundation for developing further understanding of theory and leading to more sophisticated research methodologies, thus enabling pilot studies and excellence in research to be in a symbiotic relationship (Kezar, 2000).

Pilot study components

The pilot study served as a crucial initial step, aiming at the identification of suitable participants, the refining of research methods as well as finding a suitable approach to address the specific research questions. The selection process deliberately targeted 22 individuals from German MET institutions, comprising active maritime Masters, Chief Mates, and nautical students. This ensured a diverse experience level representation of professionals within the global maritime industry. Employing qualitative research methods, meaningful interviews were conducted digitally via Zoom Recording service and Otter.ai transcription for the pilot study. Each interview transcription underwent careful deliberation, selecting actions that represented prominent subjects for further investigation in the paper. Valuable insights were gained into the complexities of intercultural communication and competency within MET through coordinated interviews which focused on communication, culture, diversity, conflict and teamwork. The pilot study laid the foundation for the subsequent survey and interview phases of the research project.

Table 37 : Pilot Study Questions (Source: Own Work)

#	Question?
1	How would you describe communication?
2	You have been asked to deliver an information session for your co-worker or subordinate who do not master the language nor share the same working attitude. How would you prepare yourself and which approach would you follow?
3	When interacting with a person from a different culture than your own, how do you ensure that communication is effective?
4	Does your way of communicating change when you are working in an intercultural group compared to a group of the same nationality?
5	Could you describe the differences and explain them?
6	Assuming you are speaking with somebody who doesn't master your language, what would you be able to do to anticipate or overcome communication breakdowns?
7	What does culture mean to you?
8	What makes your own culture different from the others that you know? How would you describe intercultural competence?
9	Do you feel that culture impacts our behaviour or is it the other way round?
10	What elements of your identified culture had the most influence on who you are?
11	What has helped you the most to build your intercultural competence?
12	Do you think that "learning about other peoples' cultures" is profitable for the work process? How so?
13	What do you think are the important factors that would be needed dealing with in an intercultural group?
14	Regarding your work activities on board, what do you think students should learn about culture?
15	How thoroughly do you inform yourself about other cultures?
16	To what extent does this help you in your job?
17	How would you define diversity?
18	What do you think are the opportunities and challenges when different cultures live together?
19	Tell me about a time when you were asked to do something you had never done before. How did you react? What did you learn?
20	How do you handle critical or constructive feedback? Which do you consider the best strategy to address feedback?
21	Which aspects feel strange when you come into contact with another culture?
22	What do you suggest students could do to enhance their social ability/skills?
23	What are the differences between working with an intercultural team compared to working with a team of the same culture?
24	Which one do you prefer? Why?
25	How do conflicts arise?
26	Describe a situation where you had a conflict with another individual, and how you dealt with it. What was the outcome? How did you feel about it?
27	Tell me about a time when you and your colleagues had different opinions and viewpoints on a project. How did you work through the differences and what was the result?

Annex III Interview questions, answers and coding

28	Can you recall a time when a person's cultural background affected your approach to a work situation?
29	If you were involved in an intercultural conflict, how might you settle it?
30	How would you define good team work?
31	Can you also elaborate in terms of Management and Operational level?
32	In what ways have you integrated multicultural issues as part of your professional development?
33	How would you respond/act to a co-worker who makes/made an insensitive remark to you or to someone else? on what factor you think your response/act depends?
34	What is the biggest challenge you have to face in intercultural teamwork? Why?
35	Working with someone with whom it is difficult to get along often happens at the workplace. What are your thoughts on this kind of situation? How would you handle it?
36	Describe the best partner or supervisor with whom you have worked.
37	What kind of management style appealed to you?

Annex V Statistical Methods for Reliability and Validity Testing

Reliability and validity testing

Reliability and validity are crucial in research, with reliability ensuring consistency and validity capturing the intended content (Du, 2010). Critical realism offers insights into validity in practice-oriented theory-testing research, particularly in information systems (Smith & Johnston, 2014). In sociological research, validity testing is independent of methodological approaches, with the use of ideal typical constructs in qualitative research enabling systematic testing (Kirchgässler, 1991). In psychological testing, the concept of validity as a property of measurement instruments is related to scientific realism, suggesting that valid psychometric tests require a realist philosophy of science (Hood S. B., 2009).

Reliability testing

Cronbach's Alpha:

Internal consistency reliability, a commonly used psychometrics tool (Dukes, 2005), is measured by Cronbach's Alpha. Multi-item scales are usually better on this point than single-item questions that are frequently unreliable (Gliem & Gliem, 2003). Both Wadkar et al. (2016) and Oviedo and Campo-Arias (2005) lay emphasis on this measure with Wadkar et al. pointing out its usefulness in evaluating attitude scales' reliability. According to Kılıç (2016), a high good reliability coefficient value should be above 0.70.

Item Analysis:

Item analysis is a vital stage in the creation and validation of measuring tools that involves examining the effect of each item on the overall consistency of the measure (Reynolds et al., 2021). This process is vital for ensuring that the measure accurately represents what it purports to represent while producing consistent results. Item analysis can be used in development and testing of instruments like individual care instrument (IC) for adults (Suhonen et al., 2000) and improving scale reliability and validity in Likert-type questionnaires (Raubenheimer, 2004). A number of studies have e.g., revealed that high reliabilities are found with regard to items in assessment instruments such as interrail suite of assessment instruments which has provided substantial reliability across various care settings (Hirdes et al., 2008).

For the reliability testing within this research following rules have been followed:

- Cronbach's Alpha (α): A measure of internal consistency, indicating how closely related a set of items are as a group. A higher value (typically above 0.7) indicates better reliability.
- Average Interitem Correlation: The average of all correlations between pairs of items. It provides an overall indication of how well items are related to each other.
- Item-Rest Correlation: The correlation between an individual item and the sum of the rest of the items. Higher values indicate that the item fits well with the overall scale.
- Cronbach's Alpha (if item dropped): Indicates the overall Cronbach's alpha if a particular item were removed from the scale. This helps identify if removing an item would improve or worsen the scale's reliability.

These measures collectively provide a comprehensive assessment of the reliability and consistency of the scale being analysed.

Validity testing

Principal Component Analysis (PCA):

A robust statistical method for recognizing patterns within data, extraction of systematic variations from noise and reducing the dimensions of vast datasets is known as Principal Component Analysis (PCA) (Jolliffe & Cadima, 2016); (Wold et al., 1987). It does this by constructing new uncorrelated variables referred to as principal components that maximize the variance (Jolliffe & Cadima, 2016). Tipping and Bishop (1999) in their paper further extends PCA with a probabilistic approach based on probability models and maximum likelihood estimation of parameters. Using the PCA Analysis is measuring following:

- Overall MSA: Evaluate suitability of the entire dataset for factor analysis. Overall MSA is used to determine the appropriateness of factor analysis. It assesses the extent to which the variables in a dataset are suitable for structure detection, where:
 - value closer to 1 indicates that the data is highly suitable for factor analysis,
 - value below 0.5 suggests that factor analysis may not be appropriate.
- Individual MSA: Assess the adequacy of individual variables, where:
 - values range from 0 to 1,
 - values above 0.8 are considered meritorious,
 - values between 0.7 and 0.8 are middling,
 - values between 0.6 and 0.7 are mediocre,
 - values between 0.5 and 0.6 are miserable,
 - values below 0.5 are unacceptable.
- Chi-Squared Test: Determine association between variables (evaluate using test statistic, df, and p-value). Those values measure:
 - value: The test statistic calculated from the observed and expected frequencies,
 - degrees of freedom (df): This is calculated based on the number of categories or levels in the data,
 - p-value: The probability that the observed data would occur if the null hypothesis were true. A p-value less than 0.05 typically indicates that the observed association is statistically significant.
- Component loading represents the correlation between the original variables and the components in factor analysis or principal component analysis (PCA).

- The key elements of RC1 (Rotated Component 1): This is the loading of the first rotated component. Higher absolute values indicate a stronger relationship with the component,
- uniqueness: This indicates the proportion of the variance of the variable that is not explained by the common factors.
 - Uniqueness = 1 - communality.
 - Lower uniqueness values suggest that the variable is well represented by the common factors.
- Component Characteristics: These include eigenvalues and the explained variance.
 - Eigenvalues: Measure the amount of variance explained by each component. Components with eigenvalues greater than 1 are typically considered significant.
- Explained Variance: The proportion of the total variance in the data that is explained by each component. Cumulative explained variance helps in determining how many components to retain.

Confirmatory Factor Analysis (CFA):

Confirmatory factor analysis is a powerful statistics technique used for examining how well the hypothesized measurement model fits into the observed data set (Fox, 2010). In social research it can have particular relevance, where a priori hypotheses can be imposed on the model (Sarmiento & Costa, 2019). A measurement model's appropriateness can be evaluated using CFA with findings indicating whether the model fits the data well (Ahmad et al., 2016).

As for CFA, various values to be analysed within this dissertation as follows:

- Confirmatory Factor Analysis is a statistical technique used to test the fit of a pre-specified factor model to the observed data. It aims to confirm or refute a hypothesized structure of relationships between observed variables and latent constructs (factors).
- in CFA, χ^2 (chi-squared) is a goodness-of-fit statistic that compares the observed covariance matrix of the variables with the covariance matrix implied by the specified factor model. A small, non-significant χ^2 value suggests good model fit, indicating that the specified model adequately represents the data.
- Degrees of freedom represent the number of independent pieces of information available in the data. In CFA, df refers to the number of observations minus the number of parameters estimated in the model. It is used in conjunction with the χ^2 statistic to assess model fit.

- The baseline model in CFA typically refers to a simple, often null, model against which more complex models are compared. It serves as a point of reference for evaluating the improvement in fit provided by more complex models.
- The factor model in CFA specifies the relationships between observed variables (indicators) and latent factors. It describes how each observed variable is related to the underlying constructs (factors) and how these factors are interrelated.
- In CFA, the p-value associated with the χ^2 test indicates the probability of observing a chi-squared value as extreme as the one calculated from the data, assuming that the specified model is true. A small p-value (<0.05) suggests that the model does not fit the data well.
- In CFA, parameter estimates include factor loadings, factor variances, factor covariances, residual variances, and thresholds. These estimates quantify the relationships between observed variables and latent factors, as well as the variability in the observed variables not explained by the factors.
- Factor Loadings: These represent the strength and direction of the relationship between observed variables and latent factors. Higher factor loadings indicate stronger associations.
- Factor Variances and Covariances: These quantify the variability of the latent factors and the relationships between them, respectively.
- Residual Variances: These represent the unexplained variability in the observed variables after accounting for their relationships with the latent factors.
- Thresholds: In models with categorical indicators, thresholds represent the points on the latent variable scale where the probability of endorsing a particular response category change.

Other testing

One Sample T-Test:

The one sample t-test is a valuable tool in research, particularly in determining if a sample comes from a specific population (Al-kassab, 2022). It compares the mean of a sample to a known population mean, using either a known or sample standard deviation (Ross & Willson, 2017). This test is widely used in various fields due to its practicality and ease of application (Cressie et al., 1984). The values in one Sample T-Test are important since they measure:

- T-Value: Indicates the size of the difference relative to the variation in sample data.
- Degrees of Freedom (df): Reflects the number of independent values that can vary in the analysis.
- P-Value: Shows the probability that the observed difference is due to chance. A p-value less than 0.05 typically indicates statistical significance.

Pearson Correlation:

The Pearson coefficient is a common tool for measuring the strength and trend of any linear association between two continuous variables (Schober et al., 2018). Using Pearson's coefficient can measure as follow:

- Pearson's r: This value represents the Pearson correlation coefficient, which measures the strength and direction of the linear relationship between two variables. The coefficient ranges from -1 to 1, where:
 - 1 indicates a perfect positive linear relationship,
 - -1 indicates a perfect negative linear relationship,
 - 0 indicates no linear relationship.
- p-value: This value indicates the significance of the correlation coefficient. It tests the null hypothesis that the correlation coefficient is equal to zero (no linear relationship). A low p-value (< 0.05) suggests that the observed correlation is statistically significant.

Descriptive Statistics:

Descriptive statistics as defined by Downie and Starry (2019) and McTavish (McTavish, 1988) are simply techniques through which information can be summarized and organized in such a way that patterns and relationships become apparent. They constitute the first step in doing research because they include measures such as frequency, distribution or central tendency. This makes it easier to identify particular groups within a population (Kaur et al., 2018). Pérez-Vicente and Expósito Ruiz (2009)

underline those descriptive statistics helps to understand what kind of dataset one is dealing with. This is main tool for processing answers and looking at survey power. For the descriptive statistics used in this research following information are analysed:

- Valid and Missing Counts: These provide insight into the completeness of the data. High numbers of valid responses indicate robust data collection for each variable.
- Mean: This provides an average score or measurement for each variable, offering a central tendency of the data.
- Standard Deviation: This indicates how much variation exists in the responses. A higher standard deviation means more variability.
- Coefficient of Variation: This standardizes the variability relative to the mean, allowing for comparison of variability across variables with different units or scales.

In conclusion, my stance on reliability testing, validity testing among other relevant statistical techniques combined with this integration goes to show how dedicated this research towards rigorous and sound research methodologies. I have used several tests so as to ensure that my findings are reliable hence contributing to knowledge advance.

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