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Recognizing STCW COC Class 1 Qualifications as Equivalent to an Academic Master's Degree: A Proposal for Imo and World Maritime University

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Abstract

The maritime industry, responsible for over 80% of global trade, relies on a skilled workforce to ensure safety, efficiency, and sustainability. At the apex of maritime qualifications, the STCW CoC Class 1 certifications for Master Mariners and Chief Engineers, governed by the International Maritime Organization (IMO) through the STCW Convention, set rigorous competency standards. Despite their professional recognition, these certifications lack equivalence to academic master's degrees, creating barriers for mariners seeking shore-based roles that require formal academic qualifications. This study employs a systematic and comparative research methodology to address this gap. The analysis involved collecting data from maritime academies, IMO model courses, and academic master's programs in maritime studies, engineering, and related fields. Key areas of comparison include syllabus content, contact hours, sea-time training, practical competencies, and evaluation methods. Quantitative data, such as the total hours dedicated to training and assessment, were analyzed alongside qualitative comparisons of leadership, technical expertise, and research skills. The research also involved examining the nature of practical training (e.g., sea time versus internships or co-op programs) and assessment formats (e.g., CoC competency exams versus academic dissertations). These comparative insights were synthesized to evaluate the academic equivalence of STCW CoC Class 1 qualifications. The findings reveal a significant overlap in the depth and breadth of competencies achieved through CoC training and master's degree programs, particularly in leadership, safety management, and environmental stewardship. However, the practical emphasis in CoC training far exceeds the theoretical focus of academic programs, underlining the need for formal recognition of these qualifications. This study advocates for the recognition of STCW CoC Class 1 certifications as equivalent to academic master's degrees, proposing the integration of research methodology into CoC curricula to bridge remaining gaps. The research recommends a collaborative framework between the IMO and academic institutions to standardize equivalency, unlocking career opportunities for mariners and enhancing the global maritime workforce.

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Keywords: STCW CoC, Academic, IMO, Global

Introduction

Context

Over 80% of global trade is moved by the maritime industry. Safety and disaster prevention require skilled workers who can operate complex equipment and systems. Deck officers and marine engineers help keep ships running, comply with safety rules, and protect the environment. Accreditation of competencies and qualifications is the foundation of maritime professionalism, and the STCW CoC (Certificate of Competency) is the global standard. The CoC Class 1 certification indicates advanced training, sea-time experience, and maritime safety, navigation, and engineering expertise. Mariners seeking to transition to shore-based or academic careers face a gap because the STCW CoC Class 1 qualification is widely seen as a professional credential rather than an academic degree.

Need for Change: The Growing Demand for Shore-Based Roles and the Gap in Recognition

Mariners often switch to shore-based maritime jobs for personal and professional reasons. The lack of academic equivalent recognition for STCW CoC Class 1 mariners makes it difficult for them to transition to these roles. This gap disadvantages mariners and deprives maritime and related industries of experienced professionals who could improve shore-based operations. Acknowledging STCW CoC Class 1 certifications as master's degrees in nautical science or engineering would close this gap, ease career transitions, and help the maritime sector retain and benefit from its best professionals.

Significance:

Benefits of Recognizing STCW CoC Class 1 Qualifications as Equivalent to Academic Master's Degrees

a. Career Progression for Mariners:

Navigation, maritime laws, engineering, and safety management are common skills among STCW CoC Class 1 seafarers. Recognition could allow mariners to enter managerial, policymaking, consulting, and other fields without further education, boosting morale, skills, and potential market expansion.

b. Strengthening the Maritime Industry:

Shipping is vital to global trade and transport, requiring skilled workers. Recognizing STCW CoC qualifications as academic degrees may keep skilled professionals who leave for career advancements. This would also open up port operations, marine legal advisor, regulatory

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compliance, and export-import business advisory jobs. These positions are best for experienced mariners with a strong sense of specialization.

c. Economic Benefits:

Nations with strong fleets or ports may benefit from better sea officer recruitment and training for shore employment. STCW CoC qualifications could improve maritime education and open up the professional market. Technology, environment, and trade changes can be addressed by maritime economies by strategic positioning and professional staff retention.

d. Global Recognition and Standardization:

The maritime profession could benefit from standardized STCW CoC qualifications, similar to master's degrees, allowing mariners to switch jurisdictions easily. This would also encourage interaction between marine organizations and institutions with universities, enabling mariners to advance their learning through specialty master's degree programs and research undertakings.

1. Background

Maritime education and certification have progressed in tandem with developments in ship technology, global commerce, and the intricacies of contemporary navigation. The initial reliance on apprenticeships and oral knowledge transfer evolved into a demand for standardized training due to globalization, resulting in the formation of maritime academies and competency certifications. The 1978 STCW Convention established by the International Maritime Organization (IMO) implemented standardized global criteria for seafarer training, certification, and watchkeeping, enhancing safety and efficiency at sea. Amendments in 1995 and 2010 improved competency-based training, incorporated contemporary technology, and prioritized leadership, environmental conservation, and maritime security. Nonetheless, challenges endure, notably the absence of academic acknowledgement for Certificates of Competency (CoC), which has led to demands for their alignment with academic degrees to facilitate mariners' career transitions to shore-based employment.

The Training Requirements for Deck Officers and Marine Engineers

The STCW convention provides a comprehensive training framework for officers and marine engineers, ensuring they are well-equipped to manage challenging operations on modern boats and ships. The framework consists of several stages that cover various aspects of maritime operations.

Deck Officers: Training and Certification

The STCW Convention mandates strict training and certification procedures for professional ship operations and navigational personnel, including deck officers. These officers must

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undergo a series of qualifications, starting with the deck cadet stage, where they learn basic maritime skills and gain sea experience. The next step is the Officer of the Watch (OOW) certification, which requires additional training and accumulated sea service hours. The OOW certification focuses on watchkeeping duties, risk-free navigation, and ship operations management.

To become a Chief Officer, officers must accumulate 12-18 months of sea service, gain practical experience in navigation, cargo handling, and crew management, enroll in advanced training courses, and pass comprehensive assessments to obtain the Chief Mate Certificate of Competency (CoC). With this certification, officers can serve as Chief Officers, overseeing cargo operations, managing the deck crew, ensuring safety regulations, and assisting in navigation and ship management.

The highest level of deck officer certification is the Master Mariner, which requires years at sea and special courses in handling, leading, and managing emergencies. Merchant Marine Masters hold an affirmative duty of seaworthiness and must establish efficiency in handling and supervising ship affairs.

Marine Engineers: Training and Certification

Marine engineers undergo training under the STCW Convention, focusing on technical aspects of shipboard operations. The initial phase involves the engine cadet phase, where they learn mechanical engineering, hydraulics, electricity, and shipboard machinery. The Engineering Officer of the Watch (EOOW) certification allows engineers to take watchkeeping duties in the engine room, requiring additional study on the ship's main propulsion plant, fuel control, and processing systems.

To become a Second Engineer, candidates must complete 12-18 months of sea service in an operational role within the engine department on vessels of the required size and propulsion power. They then enroll in advanced training courses, focusing on propulsion plant management, marine engineering systems, leadership, and environmental compliance. After passing exams, they obtain the Second Engineer Certificate of Competency (CoC). The Chief Engineer certification is the final level for marine engineers, requiring onboard service for several years and successful completion of higher-level training subjects. A Chief Engineer is responsible for all engineering occurrences on the ship and requires leadership and decision-making abilities to address technical difficulties.

2. Challenges Faced by Mariners

This study focuses on master mariners and chief engineers with STCW CoC Class 1 qualifications, which are crucial for safety, efficiency, and effective management in the global shipping industry. However, they face challenges when transitioning to shore-based roles due to the lack of academic recognition for these qualifications. This disconnect limits their ability

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to pursue roles in logistics, project management, supply chain management, consultancy, and other related fields. Addressing this gap would facilitate career mobility and allow the maritime industry to benefit from the knowledge and experience of these professionals. The study underscores the need for a framework that aligns maritime certification with academic credentials.

The Lack of Academic Recognition for STCW CoC Class 1

STCW CoC Class 1 certification is granted to sailors who have met the Master Mariner and Chief Engineer standards. These seafarers are responsible for managing large, complex vessels, coordinating numerous people, and responding under pressure to protect life, property, the vessel, and cargo. However, there is no academic equivalent to a master's degree in maritime operation, marine engineering, or business administration in STCW CoC Class 1. This lack of academic comparison can make seamen feel inadequate and limited in promotion, as they must earn other academic qualifications for shore-related professions, which can be time- and money-intensive. This may require academic degrees or conversion courses, which may not always be effective. The STCW CoC Class 1 provides intensive training and competency evaluations but still it is not recognized as an academic program.

Barriers to Transitioning to Shore-Based Roles

a) Perceived Lack of Transferable Skills

Mariners' leadership, crisis management, logistics, problem-solving, technical operation, and team management skills are crucial for transitioning to other companies on shore. However, they are often overlooked due to the belief that sea skills cannot be transferred to land. Mariners without university-accredited maritime qualifications may be distrusted by companies, limiting their job options in upstream oil and gas, maritime logistics, and supply chain mosses. Master mariners and Chief Engineers are accustomed to handling various operations under pressure, but lack of formal academic education may lead employers to dismiss qualitative leadership skills.

b) Academic Equivalency Gap

Most countries require applicants to have a degree equivalent to an academic Master's degree for shore-based jobs. However, the STCW CoC Class 1 qualification is not recognized in many learning systems, so mariners need to seek other qualifications like MBA, MSc in Logistics/Project Management, or engineering degrees to meet educational entry requirements for white-collar occupations.

The gap between vocational training and academic qualifications is a significant issue, as employers often mimic recruitment bodies, where seagoing experience may not be valued or rewarded as expected. This results in limited career mobility, causing frustration among

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experienced sea-related personnel and hindering the transfer of skilled individuals into shore-based professions, despite their wealth of experience. Employers must adapt to this situation to ensure competitiveness and career progression for seagoing professionals.

Delayed Career Transition

Seafarers often seek career transitions after years of service, driven by the physically demanding nature of their roles, growing family commitments, or the desire for a more stable corporate lifestyle. However, the lack of academic recognition for the CoC Class 1 qualification poses significant challenges, hindering smooth career progression. Mariners may need to undergo additional retraining or education to address gaps in formal academic credentials, a process that can be both financially and emotionally exhausting. This period of transition often forces seafarers to step away from well-paying roles, leading to financial strain. The demand for academic degrees can further burden mariners with substantial costs, including debts from training programs or prior sea-related expenses, deterring many from pursuing these career shifts. These obstacles often result in missed opportunities in non-maritime sectors, limiting mariners' ability to leverage their extensive skills and experience.

Missed Opportunities in Non-Maritime Sectors

Certified mariners holding STCW Class 1 CoC are skilled in logistics, project management, security risk, and crisis management. However, due to lack of academic equivalency, they often struggle to access jobs in sectors like oil and gas, logistics, transportation, engineering consultancies, and project management firms. These sectors now require managerial and technical staff with academic qualifications, leaving mariners with practical experience behind. This leads to job discontent and stagnation, as mariners provide services below their potential.

Inadequate Recognition of Maritime Leadership Skills

Superintendents of vessels, including those with Master Mariner and Chief Engineers' tickets, develop leadership skills that are rarely recognized in other industries. They oversee human resources, coordinate functional elements, and make important decisions in a highly saturated environment. However, the STCW CoC Class 1 does not offer official recognition for leadership and management in shore-based leadership positions. This disparity between the concept of leadership in the maritime business and other terminal businesses hinders many mariners from achieving their full leadership capacity. Master Mariners entail effective organizational skills, controlling staff, financial resources, and work plans, which are applicable to onshore organizations. However, these competencies are not well recognized academically, leading to potential career loss.

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3. Methodology

Data Collection

This study aims to gather detailed information about the educational frameworks of STCW CoC qualifications and academic master's degree programs in maritime disciplines. Data will be sourced from maritime academies, IMO model courses, and academic maritime programs. The STCW CoC qualifications will be analyzed from numerous maritime academies and institutes, including syllabi and course structures. The IMO model courses will be considered for certification under the STCW Convention, covering marine security, navigation, engineering control, and ship management. Academic master's degrees will be obtained from reputable universities and institutions. To achieve equal comparison, contact hours, subjects, and training specifications will be systematically gathered. Diagrams of course schedules, pragmatic exercises, and certification tests will be provided to illustrate educational pressures. This data will be used to establish variance and compare academic and vocational training systems.

Comparison Process

The study will compare the STCW CoC qualifications and academic master's degree programs in maritime engineering, ship management, maritime law, and navigation. The analysis will focus on the subjects and syllabi of the two training frameworks, ensuring they correspond to the academic maritime master’s degree. The total number of contact hours will be used as a comparison factor, considering the time required at sea for hands-on experiential training. The evaluation and assessment strategies used in both training systems will also be discussed. The CoC examinations for Master Mariners and Chief Engineers will be compared to the dissertation or thesis required for the academic Master's programs, allowing comparison of complexity and practical skills. The analysis of various skills obtained in the training processes, such as leadership, analytical and decision-making, problem-solving, and technical competence, will be conducted to determine if the STCW CoC 1 qualifications provide skills comparable to those in the academic Master's Degree programs.

Recommendation process

The International Maritime Organization (IMO) is set to develop recommendations based on the analysis of the equivalence between STCW CoC Clas 1 qualifications and master's degree programs. The recommendations will aim to equate the STCW CoC Class 1 qualification to any academic master's degree in maritime studies, marine engineering, or nautical science. The changes will benefit mariners and the maritime sector, including improved employment promotion, transition of maritime specialists to other industries, and maintaining a competent workforce. If deficiencies are identified, additional modules in STCW training will be incorporated to close gaps between vocational training and academic education. The IMO will

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also be tasked with allowing recognition of STCW CoC Class 1 qualifications as equivalent to master's degrees in related disciplines, benefiting mariners by expanding job opportunities and recognizing the significant training and experience required for certification.

4. Comparative Analysis: STCW CoC vs. Academic Master's Degrees

Syllabus Content Interpretation :

The study compares the syllabus content of STCW CoC qualifications for Master Mariners and Chief Engineers with academic master's degrees in maritime disciplines, assessing their equivalency. It evaluates the depth and breadth of topics covered in both educational pathways, focusing on theoretical knowledge and practical competencies.

Table 1: Syllabus Comparison: Topics Covered in STCW CoC vs. Academic Master's Degrees

Topic Area	**STCW CoC Class 1 (Master Mariner/Chief Engineer)**	**Academic Master's Degrees in Maritime Studies/Engineering**
Maritime Law and Regulations	International Maritime Law, SOLAS, MARPOL, ISPS	International Maritime Law, Maritime Policy, Shipping Law
Ship Construction and Stability	Ship Design, Stability Criteria, Structural Integrity	Advanced Ship Design, Marine Structures, Stability and Hydrodynamics
Navigation and Bridge Management	Advanced Navigation, Bridge Watchkeeping, Collision Avoidance	Navigation Systems, Bridge Operations, Autonomous Ships
Marine Engineering and Systems	Engine Room Management, Power Generation, Machinery Operations	Marine Engineering, Propulsion Systems, Shipboard Machinery
Ship Operations and Safety	Safety Management, Cargo Operations, Emergency Drills	Maritime Safety Management, Crisis Management, Emergency Response
Environmental Management	Pollution Prevention, MARPOL, Ballast Water Management	Marine Environmental Engineering, Waste Management Systems, Eco-friendly Technologies

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Human Resources and Management	Leadership, Crew Management, Communication Skills	Maritime Management, Leadership in Shipping, Organizational Behavior
Research and Methodology	Risk Assessment, Technical Report writing, Survey-inspection-audit technics and reporting, reporting requirements of new rules, regulations to concerned authority and IMO.	Research Methods, Thesis/Dissertation Preparation

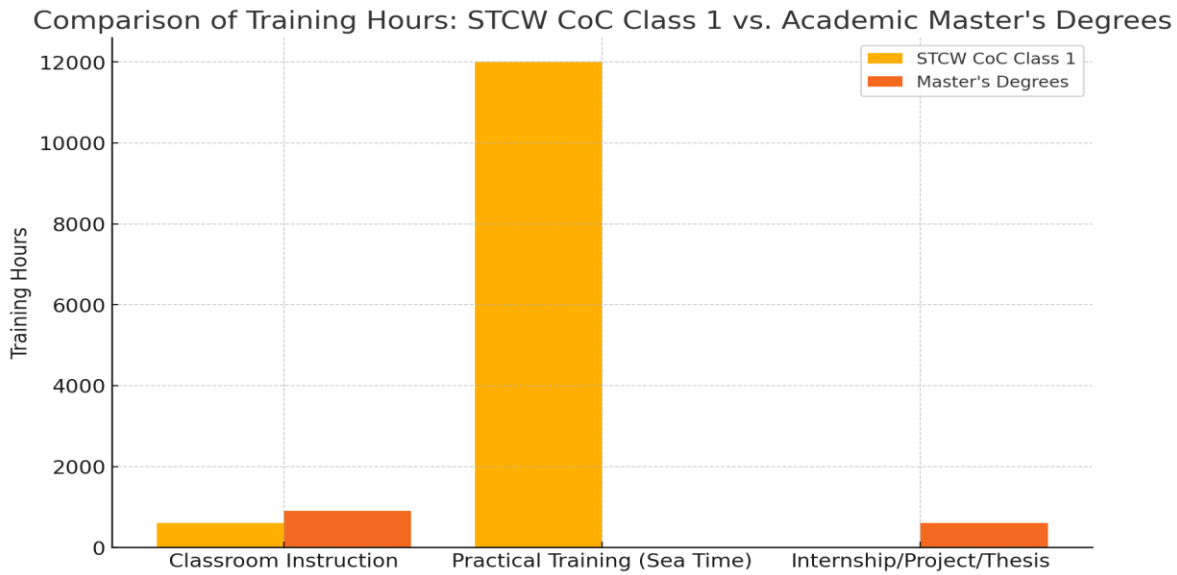

Figure 1: Comparison of Training Hours: STCW CoC Class 1 vs. Academic Master's Degrees

The figure compares STCW CoC qualifications and master's degree programs in maritime disciplines, highlighting content alignment and misalignment. STCW CoC qualifications focus on navigation, marine engineering, safety, and ship operation, aiming to determine seagoing proficiency. Academic master's degree programs, on the other hand, combine practical elements with an academic approach, incorporating extra preparations in the field of study and methodology.

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STCW CoC Class 2 and Class 1 Deck - Key Areas

- Advanced navigation encompasses celestial navigation, voyage planning, and electronic navigation systems.
- Ship Handling and Maneuvering: Docking, undocking, and performing advanced maneuvers in difficult conditions.
- Cargo Operations: Advanced handling of general, hazardous, and special cargo (e.g., liquids and chemicals).
- Maritime Law: Fundamental concepts such as flag state and port state control, SOLAS, MARPOL, and STCW compliance.
- Safety and emergency procedures include advanced firefighting, search and rescue, and crisis management.
- Maritime Resource Management entails leadership, teamwork, and interdepartmental coordination.
- Engineering Knowledge: Basic propulsion systems and automation are relevant to bridge officers.
- Meteorology involves advanced weather analysis and route optimization.
- Leadership and management skills are required for operating a ship and managing multicultural crews.

Master's in Nautical Sciences Coverage

The Master's program in Nautical Sciences includes a blend of STCW-aligned technical training and academic, research-based, and managerial topics. These normally include: Navigation and Ship Handling (Master Navigation, Regulation of Maritime Traffic, Maneuvers) Maritime Law (Maritime Law Basics, Specialized Maritime Law Program) Maritime Resource Management (Group Communication, Case Studies) Safety, Maintenance, and Survey (Inspection, Survey, and Maintenance) Cargo Handling (Advanced Tanker Training) Automation and Propulsion Systems (Propulsion, Automation) Meteorology and Ice Navigation (Optional Course)

Assessment of Substituting 24 Months of Sea Time for Academic Coursework in a Master's Program

This document examines the feasibility of substituting 24 months of practical sea time for the academic requirements of a Level 7 Master's degree in Nautical Science. The program encompasses key subjects such as supply chain management, data analysis, strategic management, maritime environmental studies, and the completion of a master's thesis. The assessment focuses on evaluating whether the skills and knowledge acquired through practical sea experience align with the academic standards and outcomes of the program.

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Key Considerations

Sea time involves operational tasks like navigation, cargo handling, and safety management, which may overlap with strategic management and data analysis. Academic coursework in areas like supply chain management, data analysis, and maritime environmental studies often includes theoretical foundations and analytical techniques not typically covered during onboard experience. Recognition of Prior Learning (RPL) allows credit exemptions in some institutions, but only when professional experience meets academic course learning outcomes.

Assessment of Potential Substitution

Table 2: It evaluates the feasibility of substituting sea time for the identified academic areas:

Academic Area	Sea Time Relevance	Substitution Feasibility
Supply Chain Management	Moderate: Onboard experience focuses on cargo operations, logistics networks and trade.	Moderate: though it requires some additional academic understanding of global logistics.
Data Analysis	Moderate: Basic data handling (e.g., voyage data, fuel consumption) may overlap.	Moderate: Partial exemption possible if advanced analytical skills are demonstrated.
Strategic Management	High: Leadership roles onboard provide insights into decision-making.	High: full exemption possible for management-related aspects.
Maritime Environmental Studies	Moderate: Operational compliance with MARPOL/IMO regulations may overlap.	Moderate: It may require broader knowledge of environmental science and policy.
Master's Thesis	Minimal: Sea time may contribute valuable insights to a thesis but cannot replace the research and academic writing required in a master's program.	May not be feasible: Thesis is an essential academic requirement.

It may be recommended to apply for Recognition of Prior Learning (RPL) or credit exemption in areas with substantial experience in operational data handling, decision-making, or environmental compliance. Completing required academic coursework is advisable for areas like supply chain management and maritime environmental studies.

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Substitution of Onboard Experience for Master's Thesis in Nautical Science

The document assesses the feasibility of combining onboard practical experience and hands-on work for the research thesis component of a Master's Degree in Nautical Science program, and estimates potential credit hours based on relevant experience.

Key Considerations

A master's thesis is a research-driven academic exercise that contributes new knowledge to a field. It involves literature review, hypothesis formulation, data collection, analysis, and presentation of findings. Onboard activities like technical report writing, damage survey, inspection reporting, internal audits, risk management, and emergency management require documentation, analysis, and decision-making skills. However, these activities may lack theoretical depth, research methodology, and academic rigor. Partial or full substitution depends on institutional policies and learning outcomes.

Estimate of Substitute Hours

The study estimates substitution hours for thesis hours based on the relevance and depth of onboard activities. Partial substitution, where well-documented and relevant activities can substitute 30-50% of thesis hours, is possible. Full substitution, however, is unlikely unless the onboard experience includes an equivalent academic research component, such as structured projects or publications.

Onboard activities like surveys, inspections, risk assessments, and technical reports can potentially serve as alternatives to traditional research theses or dissertations for CoC Class 1 holders seeking an academic Master's degree. However, for this to be academically viable, several considerations must be addressed:

Key Points to Consider

1. **Demonstration of Academic Rigor**

Onboard activities need to align with the core objectives of a research thesis:

- Critical thinking and problem-solving
- Systematic analysis and application of theories
- Contribution to the body of knowledge in the field

These activities should demonstrate not just practical execution but also reflective analysis, innovation, and theoretical grounding.

2. **Standardization and Documentation**

To ensure academic acceptance:

- Standardized templates or guidelines can help structure the reports.
- Activities must be documented comprehensively, showing clear methodologies, findings, and conclusions.

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3. **Alignment with Academic Goals**

Academic research often emphasizes creating new knowledge or insights. Onboard reports can meet this by:

- Addressing specific maritime challenges
- Offering evidence-based solutions or innovations
- Bridging the gap between maritime practices and academic theories

4. **Mentorship and Guidance**

Academic advisors or mentors could help refine onboard reports to meet academic expectations, ensuring relevance and rigor.

5. **Assessment Criteria**

A robust framework for evaluating these reports should be developed, focusing on:

- Depth of analysis
- Quality of evidence and argumentation
- Relevance to broader academic and professional goals

6. **Benefits**

- Recognizes practical expertise of seafarers
- Reduces duplication of effort (seafarers often already conduct detailed analyses as part of their roles)
- Makes academic programs more accessible and relevant to maritime professionals

7. **Challenges**

- Resistance from academic institutions to non-traditional approaches
- Ensuring consistency across different maritime organizations
- Limited awareness of how to integrate practical activities into academic frameworks

Proposed Model

- **Activity-Based Thesis**: Combine multiple onboard activities into a cohesive report demonstrating how they address a central research question or topic.
- **Reflection and Analysis**: Include a reflective section discussing lessons learned, challenges faced, and connections to maritime theories or practices.
- **Academic Review**: Subject the compiled work to peer or faculty review to ensure academic standards.

This approach could bridge the gap between practical maritime expertise and academic recognition, benefiting both seafarers and academic institutions.

How to Apply for Substitution

To apply for substitution, candidates must provide documentation of onboard activities, match their experience to the thesis requirements, and check the institution's policy. Up to 50% of the thesis requirements can be substituted with relevant onboard experience, and candidates should prepare a portfolio demonstrating how their onboard work aligns with the academic objectives of the thesis.

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Twenty-four months of sea time experience as a certified Third Officer, Second Officer, or Chief Officer could be recognized as equivalent to 30-60 credit hours toward a Master's Degree in Nautical Science. This approach may encourage maritime universities to integrate professional sea experience into their academic credit frameworks.

- **Advanced Professional Responsibilities**
  Officers at higher levels handle complex tasks like navigation, cargo operations, safety management, and international regulations, demonstrating advanced competencies and decision-making skills comparable to those taught in academic courses.
- **Industry Standards and Competencies**
  The maritime industry acknowledges officer-level training as meeting global standards like STCW, which align with Master's level coursework learning outcomes.
- **Real-World Application and Learning**
  Practical experience onboard ships offer hands-on learning in problem-solving, team management, and operational efficiency, often more impactful than theoretical coursework.
- **Precedents in Other Fields**
  Maritime education can follow similar practices to business and healthcare, ensuring consistency across professions and incorporating professional experience into advanced degrees.
- **Bridging the Gap Between Academia and Industry**
  Sea time experience fosters stronger connections between academic institutions and the maritime industry, ensuring that academic programs remain relevant to real-world professional demands.
- **Encouraging Lifelong Learning**
  The recognition of professional experience credit encourages officers to pursue higher education, valuing their practical knowledge, and aligns with global efforts to promote lifelong learning in all industries.
- **Equivalency in Effort and Learning Outcomes**
  24 months of officer-level seatime requires continuous effort, professional development, and learning, equivalent to 30-60 credit hours in a structured academic program.
- **Contribution to Maritime Research and Development**
  Experienced officers contribute valuable insights to academic research and development, directly contributing to capstone projects, case studies, and dissertations. Recognizing 24 months of seatime experience as credit hours in a Master's program aligns with experiential learning principles, academic equivalency, and professional development, strengthening the link between academia and the maritime industry.

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Table 3: STCW CoC Class 1 Master Mariner vs. Master's in Nautical Science

The table compares STCW CoC Class 2 and Class 1 training topics, hours, and levels, and suggests potential substitution hours for Master's degree programs. It now includes 150 hours of substitution for the research thesis under Master Mariner.

Subject/Topic	Hours (Master Mariner CoC Class 1, STCW)	Hours (Master's Degree in Nautical Science)	Level (STCW)	Level (Master's)
Advanced Navigation	120	80	Operational & Management	Academic & Applied
Ship Handling and Maneuvering	60	50	Operational	Applied
Cargo Operations	80	60	Operational & Management	Academic & Applied
Maritime Law	40	60	Management	Academic
Safety and Emergency Procedures	50	40	Operational	Academic
Maritime Resource Management	30	20	Management	Academic
Engineering Knowledge	20	30	Basic	Applied
Meteorology	30	20	Operational	Applied
Leadership and Management Skills	20	50	Management	Academic
Supply Chain Management	100 (Substitute for sea time)	40	Operational & Management (Alternative)	Academic
Data Analysis	60 (Substitute for sea time)	40	Operational & Management (Alternative)	Academic
Strategic Management	100 (Substitute for sea time)	60	Operational & Management (Alternative)	Academic

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Maritime Environmental Studies	40 (Substitute for sea time)	30	Operational (Alternative)	Academic
Master's Thesis	150 (substitution – structured research activities onboard)	300	Not Applicable	Research
Advanced Firefighting (STCW)	35	-	Operational	-
Proficiency in Survival Craft (STCW)	30	-	Operational	-
Medical First Aid (STCW)	22	-	Operational	-
Medical Care (STCW)	44	-	Management	-
Security Awareness/Training (STCW)	8	-	Basic	-
GMDSS General Operator Certificate (STCW)	80	-	Operational	-
Advanced Oil Tanker Safety (STCW)	40	-	Operational & Management	-
Advanced Chemical Tanker Safety (STCW)	40	-	Operational & Management	-
ROC ARPA (Management Level) (STCW)	40	-	Management	-

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BRM (Bridge Resource Management) (Management Level) (STCW)	30	-	Management	-
ECDIS (Management Level) (STCW)	40	-	Management	-
Sea Time Contribution (24 Months)	5840 (practical)	-	Operational & Management	-
Potential Substitution for Academic Areas	300 (aggregate alternative)	-	Operational & Management (Alternative)	-
Total Hours	7299 (approx)	880 (approx)	-	-

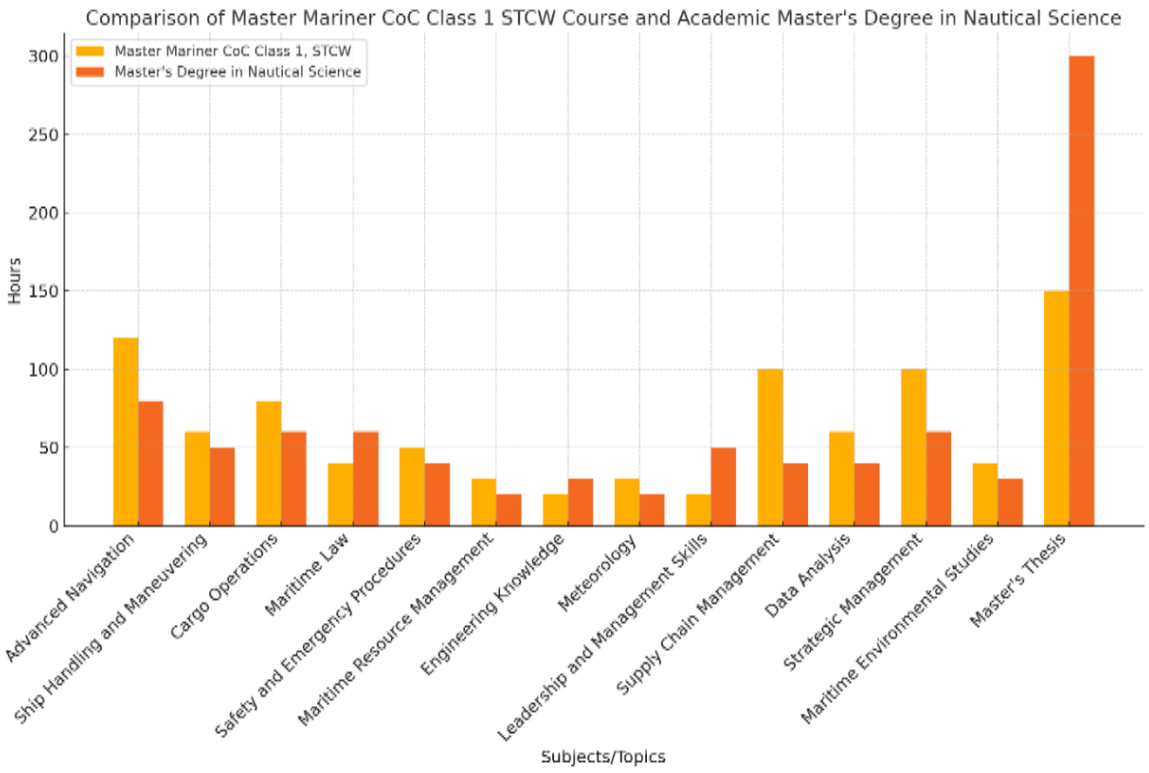

Figure 2: comparison of Master Mariner CoC Class 1 STCW Course and Academic Master's Degree in Nautical Science

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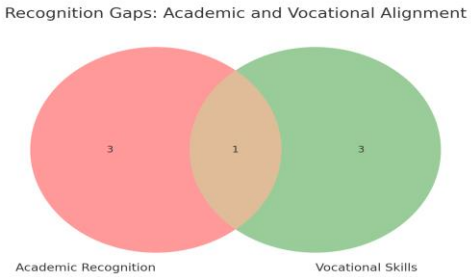

Figure 3: Recognition Gaps: Academic and Vocational Alignment:

Table-4: Comparative Table: Sea Time vs. Academic Practical Experience

Qualification	Practical Experience (Sea Time/Internship)	Nature of Practical Learning
STCW CoC Class 1 (Master Mariner/Chief Engineer)	Minimum 24 months (5760 hours if counted 8 hours daily) of sea service aboard ships	Operational experience in managing vessel operations (deck and engine room)
Academic Master's Programs (Maritime)	200~400 hours of internships or fieldwork	Industry exposure, typically not at sea; involves research or port/management roles

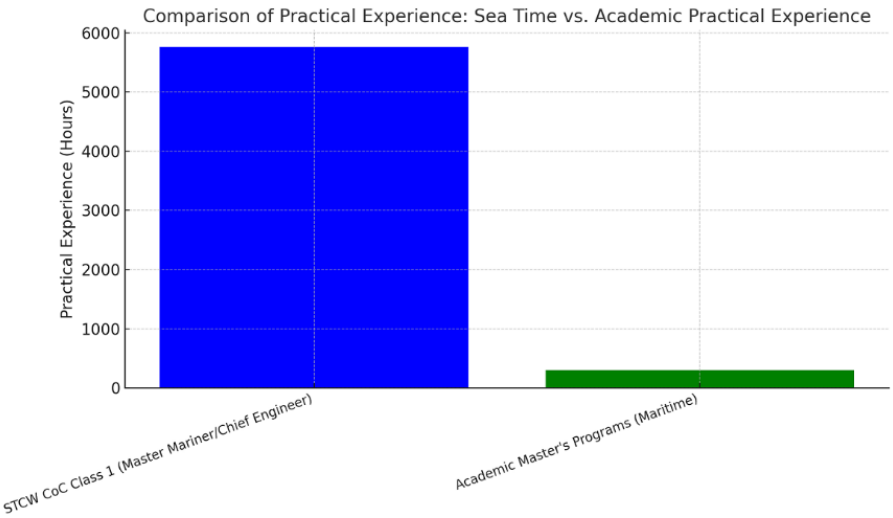

Figure 4: Sea Time vs. Academic Internship Hours

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This bar chart compares the practical experience required for the STCW CoC Class 1 (Master Mariner/Chief Engineer) qualification and Academic Master's Programs in Maritime studies. It highlights the significant difference in practical hours, with sea time far exceeding the fieldwork or internship hours of academic programs.

Interpretation of Practical Training and Sea Time

The STCW CoC Class 1 practical training specifications and academic master's programs differ in their vocational tenacity in professional maritime education. The STCW CoC Class 1 qualification requires mariners to undergo twenty four months of sea service, providing them with expanded practical exposure to leadership and technical expertise in actual maritime work. Academic master's programs in the marine field provide more theoretical information and industry experience but do not provide a similar amount of operational practical training. Most internships or field projects required in academic programs do not cover much of the shipboard experience necessary for positions such as Master Mariner or Chief Engineer.

The sea time in the STCW CoC Class 1 training is longer, providing mariners with adequate knowledge and real-life experience that will enable them to effectively handle vessels, crews, and operations under different circumstances. Academic master's programs are designed to prepare students for shore-based positions, where knowledge is applied more abstractly and often detached from the practical operation of a vessel in a marine environment.

The examination required for confirming adequate knowledge and practical skills is one of the most important components of the STCW CoC Class 1, which gives the right to become a Master Mariner or Chief Engineer. These exams are extensive, including both written and oral parts, and tests of how the skills acquired during sea time have been mastered. Academic master's degree alternatives in maritime specialties usually entail thesis or dissertation submission as an intrinsic part of the certification process.

STCW CoC Class 1 Certification: Examination Process

The STCW CoC Class 1 examination is a comprehensive test for mariners preparing for operational and leadership roles at sea, consisting of written, oral, and practical assessments conducted both ashore and during sea service.

1. **Written Examinations**:
   - The written exams for **Master Mariner** and **Chief Engineer** qualifications typically consist of multiple papers that cover a wide range of subjects, including:
     - **Navigation** (for deck officers) or **Marine Engineering** (for engineers),
     - **Ship Stability**,
     - **Ship Construction and Maintenance**,
     - **Maritime Law and Regulations** (including conventions such as SOLAS, MARPOL),

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- **Cargo Handling and Stowage**,
- **Leadership and Management**,
- **Marine Environmental Protection**.

2. These written exams are designed to ensure that candidates possess **theoretical knowledge** of ship operations and safety regulations.
3. **Oral Examinations:**
   - After passing the written exams, candidates are required to attend an **oral examination** with maritime examiners. This exam tests the candidate's **practical decision-making abilities**, **leadership**, and **management skills** under simulated shipboard scenarios.
   - The oral exams assess competencies such as:
     - **Command skills** during emergencies,
     - **Operational proficiency** in navigation and marine engineering,
     - **Safety and emergency management** (e.g., **ship stability** during cargo operations, **fire-fighting techniques**),
     - **Communication skills** (e.g., bridge and engine room communication).
   - In the case of **Chief Engineers**, the exam focuses on **engine room operations**, including maintenance, troubleshooting, and repair procedures.
4. **Practical Competency**:

Although the exams are given with respect to theoretical and practical knowledge, practical competence can be again evidenced by sea time through which the candidate is given duties in his rank and fulfils them. This also extends to shifts that are on the bridge or working in the engine room.

A minimum of 24 months sea time in officer/designated rank is required before mariners can sit for their final CoC Class 1 examination. This helps in making sure that the knowledge is not just theoretical but rather has practical application.

Academic Master's Programs: Thesis/Dissertation Requirements

In contrast to the **STCW CoC Class 1 examination**, **academic master's programs** in maritime disciplines place a greater emphasis on **research**, **theoretical analysis**, and **academic writing**. The culmination of an academic master's program is typically the **thesis or dissertation**, which serves as a final assessment of the student's ability to conduct independent research and contribute to the body of knowledge in their field.

1. **Thesis/Dissertation**:
   - The **thesis** or **dissertation** in maritime master's programs, such as those in **Maritime Engineering**, **Maritime Policy**, or **Maritime Studies**, generally focuses on a specific **research question** within the maritime domain. The process involves:
     - **Formulating a research problem** or hypothesis,

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- **Literature review** to survey existing research on the topic,
- **Methodology design** to conduct original research (e.g., qualitative or quantitative methods),
- **Data collection** (e.g., surveys, case studies, simulations),
- **Data analysis** to draw conclusions based on evidence.

○ The final dissertation must present **innovative ideas**, **research findings**, and **contributions to the field**, often with recommendations for policy or practice.

○ While the dissertation is an extensive piece of **written work**, it lacks the **practical, hands-on assessment** that the STCW CoC exam requires.

2. **Oral Defense**:

○ Many scholarly master's degrees entail an oral examination where the student presents the findings and defends the approach and conclusions to examiners.

○ This is an important part of the academic assessment but rarely measures the operational expertise or the technical savvy of the student; instead, it covers the style of communication and the extent of research conducted.

Table-5: Comparative Table: Examinations and Certification

Qualification	**Examinations/Assessment**	**Certification Type**
STCW CoC Class 1 (Master Mariner/Chief Engineer)	Written Exams (Navigation, Marine Engineering, Maritime Law), Oral Exams (Operational Proficiency), Practical Competency (Sea Time)	Certificate of Competency (CoC)
Academic Master's Programs (Maritime)	Thesis/Dissertation (Research, Analysis, and Original Contribution), Oral Defense of Dissertation	Master's Degree (e.g., MSc in Maritime Studies)

The STCW CoC Class 1 qualification and academic master's programs differ in assessment procedures. The STCW CoC exams assess practical experience and decision-making abilities during sea exercises, using end-of-term written examinations, oral interrogation, and sea time exposition. This ensures mariners are knowledgeable and capable of performing duties under simulated pressure.

Academic master's programs, on the other hand, focus on rigorous research and analysis, with students completing a dissertation at the end of the program.

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These programs do not stress the actual shipboard experience of the student. The STCW CoC Class 1 certification is a globally recognized civil credential for maritime leadership, ensuring people are eligible for responsible positions on ships.

Academic master's degree courses provide depth knowledge and research skills, but less concentration on competence in actual maritime operations.

5. Feasibility of a Dissertation-Only Master's Degree in Nautical Science

The document explores the possibility of a Master's Degree in Nautical Science program, requiring a dissertation after obtaining the STCW CoC Class 1 Master Mariner certificate, recognizing advanced professional skills.

Rationale for a Dissertation-Only Master's Degree

Achieving an STCW CoC Class 1 Master Mariner certificate demonstrates advanced professional knowledge and skills equivalent to a postgraduate level of education, fulfilling most coursework requirements for a Master's degree. Universities can recognize this certification as fulfilling most coursework requirements, leaving only the research/dissertation component. In some academic systems, prior learning and experience can count toward credit requirements. Similar models exist in other fields, such as MBA top-up programs.

Proposed Program Structure

1. Eligibility:The applicant must have a valid STCW CoC Class 1 Master Mariner certificate, at least 12 months of sea service at rank of management level, and submit a research proposal in line with university academic standards.
2. Program Components:Candidates must develop and submit a research proposal for approval, followed by a dissertation on a maritime-related topic, such as technology's role in enhancing safety or sustainability challenges in global shipping.
3. Timeline:The research process typically takes 3~6 months, depending on the university's guidelines and the research's complexity.
4. Assessment:The academic panel evaluates the dissertation, followed by an oral defense of the work, known as viva voce.

Benefits of the Program

1. Time-Efficiency:
   - The candidate focuses solely on research, bypassing coursework that overlaps with the competencies already proven by the CoC Class 1.
2. Cost-Efficiency:
   - Reduced tuition fees as coursework is substituted with recognition of prior learning.
3. Streamlined Pathway:
   - Encourages maritime professionals to pursue higher academic qualifications without duplicating existing expertise.

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Challenges and Requirements

1. University Policies:
   - Not all universities offer dissertation-only pathways, and some may require additional coursework despite prior certifications.
2. Accreditation:
   - The program must align with the national and international frameworks for academic degrees (e.g., UK Quality Assurance Agency or Bologna Process).
3. Research Focus:
   - Candidates must demonstrate strong research skills and the ability to contribute to academic knowledge in the maritime field.

A dissertation-only Master's Degree in Nautical Science or Marine Technology is feasible and aligns with the academic and professional goals of STCW CoC Class 1 Master Mariner or Chief Engineer certificate holders. Such a program could be completed within 3~6 months, offering an efficient and streamlined pathway to advanced academic qualifications.

Note: The development of an **STCW CoC Class 1 Chief Engineer Course**, designed to align with an academic Master's Degree in Marine Technology, can follow a framework similar to that of the Master Mariner course. This approach emphasizes both theoretical knowledge and practical competencies, tailored specifically to prepare candidates for senior engineering roles aboard ships.

6. Survey for CoC Class 1 Holders on Academic Recognition

A survey was conducted to understand the perceptions of Master Mariners and Chief Engineers (CoC Class 1 holders) regarding the recognition of their qualifications as equivalent to an academic Master's degree. The survey aimed to capture insights across 20 questions, focusing on support for recognition, perceived challenges, potential alternatives, and future implications. The survey revealed overwhelming support for recognizing CoC Class 1 qualifications as equivalent to a Master's degree, with respondents highlighting improved career opportunities, enhanced professional recognition, and alignment with international standards as key motivations.

Barriers and challenges identified include reluctance of universities to acknowledge vocational qualifications, lack of advocacy efforts from international organizations like the IMO, and financial interests of academic institutions. Onboard activities as alternatives to traditional research theses were supported, but concerns about standardization, alignment with academic rigor, and institutional acceptance remain significant hurdles.

The survey results underscore the strong desire among maritime professionals for academic recognition of CoC Class 1 qualifications. While challenges persist, the widespread support and willingness to advocate for change present a unique opportunity to drive meaningful progress. Recommendations include advocacy by maritime bodies and the International

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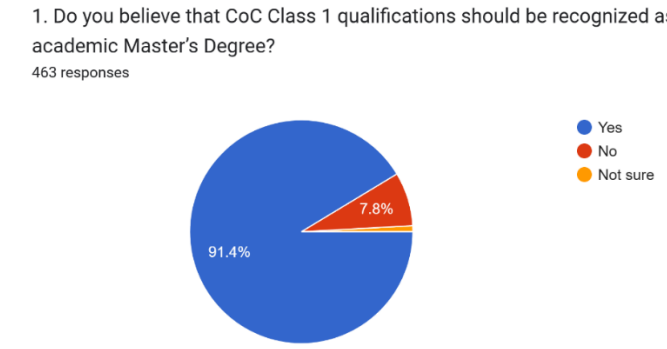
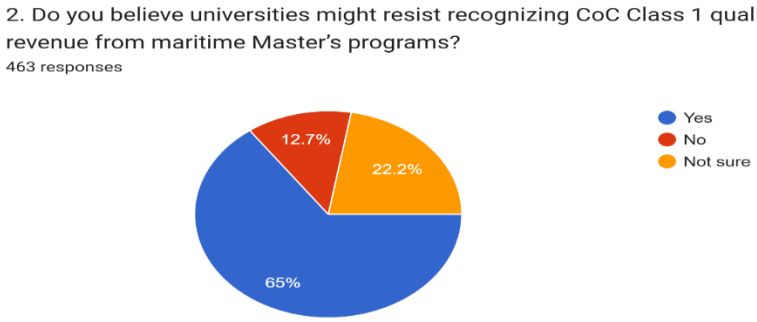
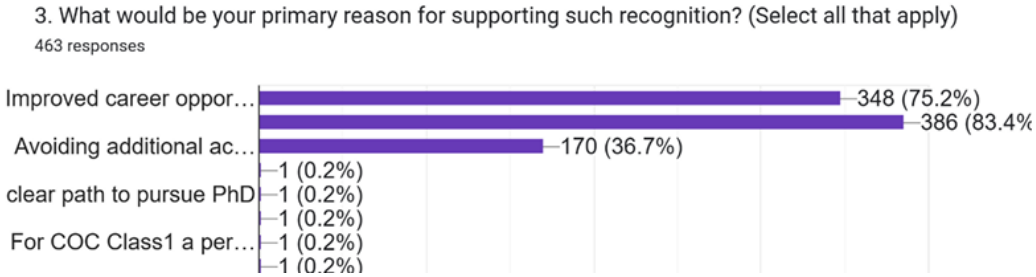
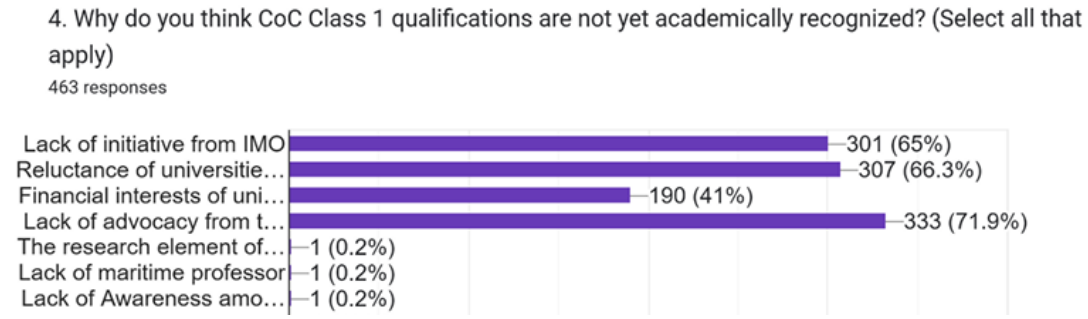
Maritime Organization (IMO), the creation of common frameworks for onboarding processes, and programs for the training and mentorship of seafarers.









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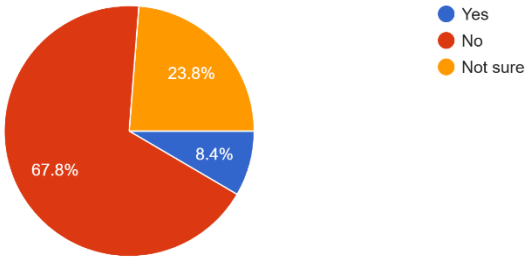
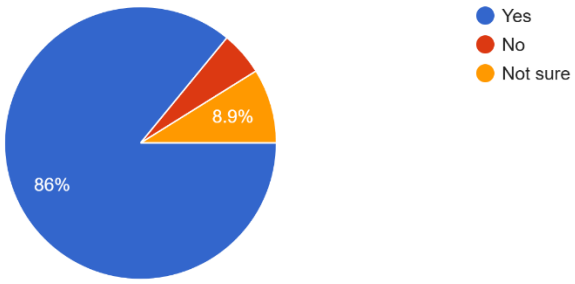
5. Do you think the International Maritime Organization (IMO) has adequately addressed this issue?

463 responses



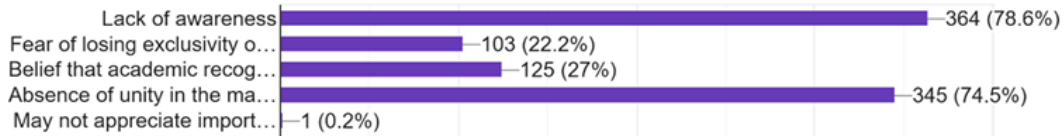
6. Would you be willing to support an advocacy group that lobbies for this recognition?

463 responses



7. Why do you think there are limited voices demanding such recognition among seafarers? (Select all that apply)

463 responses



8. What do you see as the key advantages of recognizing CoC Class 1 qualifications as an academic Master's Degree? (Select all that apply)

463 responses

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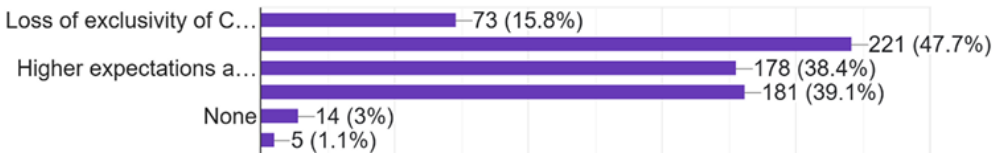
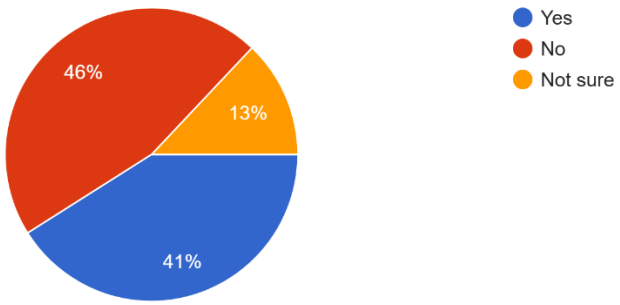
9. What potential disadvantages do you foresee if CoC Class 1 qualifications are recognized as academic Master's Degrees? (Select all that apply)

463 responses



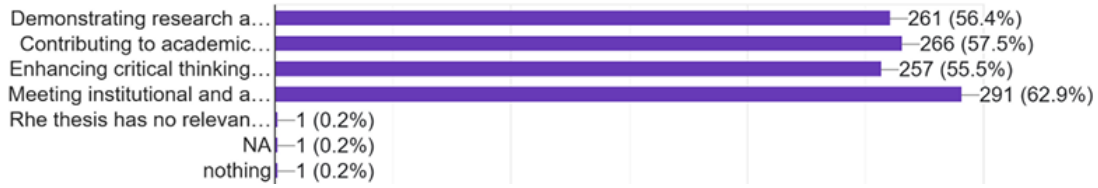
10. Do you believe a traditional research thesis/dissertation is necessary for CoC Class 1 holders seeking an academic Master's degree?

463 responses



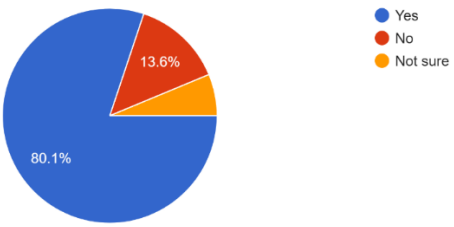
11. What do you think is the primary purpose of requiring a research thesis/dissertation? (Select all that apply)

463 responses



12. Do you think onboard activities such as surveys, inspections, risk assessments, and technical reports could demonstrate equivalent competencies to a research thesis?

463 responses



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13. Which onboard activities do you believe align most closely with academic research? (Select all that apply)

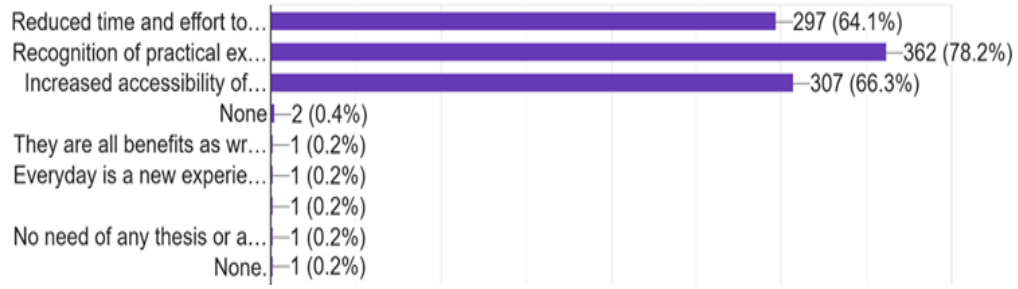
463 responses

14. What challenges might arise in using onboard activities as a substitute for a research thesis? (Select all that apply)

463 responses

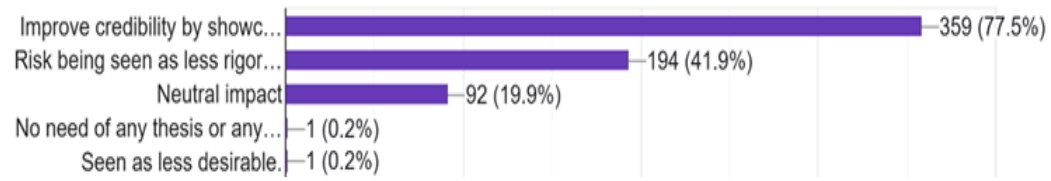
15. What do you see as the key benefits of allowing onboard activities as alternatives to a thesis? (Select all that apply)

463 responses



16. How would using onboard activities as an alternative impact the perception of CoC Class 1 holders in the academic and professional sectors?

463 responses



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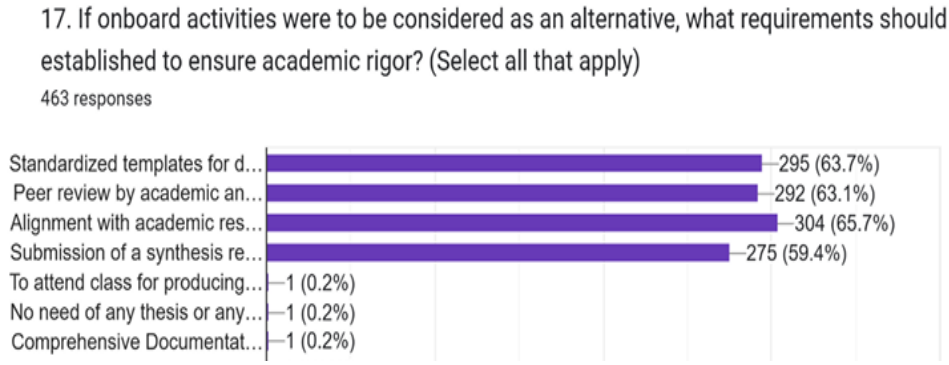

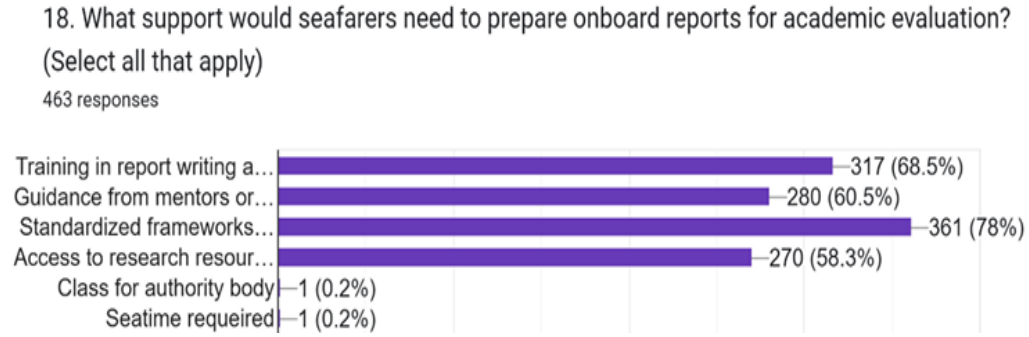

19. Do you have any additional thoughts or suggestions regarding the use of onboard activities as an alternative to traditional research theses for CoC Class 1 holders? 278 responses

20. Do you have any additional comments or suggestions regarding the recognition of CoC Class 1 qualifications as equivalent to academic Master's Degrees? 277 responses

7. Recommendations

The STCW CoC Class 1 qualification, which is recognized as an academic master's degree in marine fields, offers a unique opportunity to enhance the perspective of mariners and align with marine professional certifications as the standard of academic degrees. The CoC Class 1 qualifications have high levels of technical competency, practicum, and leadership competencies, comparable to those in academic master's programs in maritime fields like maritime engineering, maritime studies, or marine science. Acknowledging these qualifications would not only benefit seafarers but also the overall maritime community. The International Maritime Organization (IMO) and World Maritime University (WMU) are recommended to fully approve the STCW CoC Class 1 qualification as an academic master's degree in marine fields, recognizing the rigorous training and practical journey towards earning this qualification. This accreditation could pave new employment opportunities for mariners and facilitate a better transition between sea and shore maritime employment. Additional course

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components, such as research methodology and academic writing, could further enhance the educational nature of the STCW CoC Class 1 qualification.

The Standard of Training, Certification and Watchkeeping for Seafarers (STCW CoC) Class 1 qualification aims to enhance mariners' leadership and management skills. It includes courses in leadership, organizational behavior, project management, and financial management, which are beneficial for shore-based jobs. The implementation of the STCW CoC Class 1 qualification as equivalent to an academic master's degree requires an implementation plan involving stakeholders such as maritime training institutions, IMO, WMU, and practicing managers and professionals. The plan should include comparing the STCW CoC Class 1 and academic master's degrees, advocating for extra academic elements, and establishing an accreditation structure. The integrated new curriculum should be tested at selected maritime academies to identify strengths and weaknesses. After pilot programs are implemented, an application for recognition should be lodged with the IMO and WMU. The recognition process will be phased over several years, with stakeholder engagement, policy advocacy, pilot programs, feedback, and full participation by the fifth year. The recognition of the STCW CoC Class 1 qualification will not only enhance mariner career advancement but also strengthen the maritime industry and strengthen the global economy.

The existing CoC Class 1 holders should be qualified to get the academic master’s degree after completion of a thesis or dissertation.

8. Memorandum to the IMO

Purpose:

The memorandum requests the International Maritime Organization (IMO) to consider the STCW CoC Class 1 Seafarer Qualifications, specifically Master Mariners and Chief Engineers, and seek academic master's degrees in maritime studies or engineering. It emphasizes the qualifications' professional relevance and their welcome recognition in sea transport, the international economy, and mariner careers.

Summary of Findings:

The comparative analysis conducted in this research reveals several key findings that support the recognition of the STCW CoC Class 1 qualifications as equivalent to an academic master's degree:

The STCW CoC Class 1 qualifications for Master Mariners and Chief Engineers cover advanced navigation, marine engineering, ship management, safety procedures, and environmental regulation, similar to academic master's degrees in maritime studies and engineering, and broader industry operation, technology, and policy.

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Contact Hours and Training: Industry certification/STCW CoC Class 1 qualification involves over 12 months of sea experience for each rank, exceeding the training hours for an academic master's degree. This extensive training is crucial for master mariners or chief engineers.

Professional Experience and Competency: The STCW CoC Class 1 qualifications prioritize knowledge gained through Sea Time, as it provides crucial operational experience for mariners. While some academic master's degree programs offer practical training, they lack the professional and vocational aspects of CoC Class 1 qualifications.

Examinations and Certification: The STCW CoC involves rigorous examinations, including written and oral tests, to obtain a Master Mariner or Chief Engineer certificate. These tests, combined with mandatory IMO model courses, demonstrate the need for both theoretical and practical training.

Professional Development and Career Opportunities: The STCW CoC Class 1 certification, an internationally valid document, enables mariners to work as officers and be promoted in the maritime sector, but a master's degree is required for international migration.

Conclusion and Request: The IMO and WMU are urged to recognize STCW CoC Class 1 for Master Mariners and Chief Engineers as equivalent to an academic master's degree in Maritime Studies or Marine Engineering.

Additional Components:

The IMO should enhance the academic elements of the STCW CoC Class 1 qualifications to match academic Master's degree programs, including research methods, dissertation writing, and major projects on maritime-related subjects, for mariners' advanced research and sector development.

Implementation:

For the purpose of this recognition, we suggest that the following phases be implemented: First, the comparative analysis and findings be put to the IMO in a formal manner. Additional offerings of the proposed academic components introducing a framework for correlating the STCW CoC Class 1 curriculum to academic degree programs in Master’s should be included in the proposal. In the case of the approval of the proposal, maritime training institutions will be required to make modifications to their syllabi, and pilot programs must be developed to check the efficiency of the new parts.

By considering the STWC CoC class 1 qualification as equivalent to an academic master's degree, the IMO will not only be fostering the career growth of mariners but also assisting in enhancing the global maritime industry by ensuring a workforce ready to address the challenges of modern shipping, safety, and environmental protection. We call on the IMO to provide the

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required follow-up for this kind of recognition for the benefit of mariners, employers, and the maritime industry as a whole.

9. Conclusion

The STCW CoC Class 1 qualification, Master Mariners and Chief Engineer's certification, should be accredited as equivalent to an academic Master's degree in maritime-related fields. This is crucial as it grants state-sponsored equivalence of Master Mariner and Chief Engineer certifications to academic qualifications, enhancing mariners' opportunities for shore-based employment. Accreditation would revolutionize career trajectories, enabling progression to onshore professions such as policymaking, shipping management, research, education, and scholarships.

Recognizing CoC Class 1 qualifications would elevate the professionalism and efficiency of maritime personnel, contributing significantly to enhancing the maritime sector's caliber and operational standards. Global recognition of maritime qualifications would simplify employment processes and promote standardized acknowledgement of seafarers.

Aligning CoC Class 1 with academic master's degrees would save mariners time and resources, simplifying transitions from sea-based roles to shore-based positions, retaining experienced maritime professionals, reducing the loss of skilled human capital, and ensuring long-term industry sustainability.

CoC Class 1 aligns with the European Qualifications Framework (EQF) Level 7, equivalent to a postgraduate degree, and many countries align it with national postgraduate standards. The International Maritime Organization (IMO) needs to work quickly to recognize the STCW CoC Class 1 qualification as the same as a master's degree, enabling mariners with academic qualifications to pursue advanced opportunities while enhancing the maritime industry's capacity to address global challenges in shipping and trade.

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