

The Delphi Consensus on Maritime Education Reform: Prioritizing Soft Skills, Safety, and Seafarer Well-Being Post-Crisis

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ABSTRACT

This study examines the need to reform Maritime Education and Training (MET) in response to challenges affecting seafarer well-being, safety, and professionalism, particularly in the post-pandemic context. The study aims to identify priority areas for improvement and propose evidence-based recommendations. Using the Delphi method, ten subject-matter experts from academia and industry participated in iterative rounds of structured questionnaires to achieve consensus. Findings revealed moderate agreement (Kendall's $W = 0.309$) on seven priority program areas, with actual training, academic development, and practical skills ranking highest. Experts emphasized the importance of integrating soft skills, technological competencies, and mental health support into training systems. The results highlight the need for a holistic and multidisciplinary approach to maritime education that goes beyond technical proficiency. The study concludes that policy reforms should prioritize experiential learning, continuous professional development, and well-being initiatives to ensure globally competitive and resilient seafarers. These findings provide implications for international maritime education policy and institutional curriculum development.

Keywords: *Maritime Education and Training, Delphi Method, Seafarer Well-being, Soft Skills, Professional Development, Safety Training*

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INTRODUCTION

The maritime industry has long been a vital component of global trade and economic development, relying heavily on the expertise and resilience of seafarers to ensure safe and efficient operations at sea. However, recent global challenges, particularly the COVID-19 pandemic, have profoundly impacted seafarers' well-being, safety, and professionalism. The pandemic-induced crew change crisis exposed vulnerabilities in maritime operations, with extended contracts, social isolation, and increased mental health issues among crew members adversely affecting their performance and overall industry safety (**Brooks & Greenberg, 2022; Sliskovic, 2020**). Addressing these challenges calls for a comprehensive enhancement of Maritime Education and Training (MET) programs to better equip seafarers for the evolving demands of the industry.

In this context, the United Nations Sustainable Development Goals (SDGs), provide an overarching framework that aligns with efforts to improve maritime education and promote seafarers' welfare. Specifically, this research intersects with SDG 3 (Good Health and Well-being), SDG 4 (Quality Education), SDG 8 (Decent Work and Economic Growth), and SDG 14 (Life Below Water). Addressing seafarers' mental health, stress, and social support needs directly supports SDG Target 3.4, which focuses on promoting mental health and well-being (**United Nations, n.d.-a**). Furthermore, innovating MET curricula to encompass technical expertise, practical capabilities, and soft skills aligns with SDG Target 4.4, which aims to substantially increase the number of youth and adults who have relevant technical and vocational skills for employment and decent jobs (**United Nations, n.d.-b**). Upholding professional standards, crew welfare, and safe working environments advances SDG Target 8.8, which seeks to protect labor rights and promote safe and secure working environments for all workers (**United Nations, n.d.-c**). Finally, cultivating competent, environmentally conscious seafarers contributes to SDG Target 14.c, which emphasizes enhancing the conservation and sustainable use of oceans and their resources by upholding international safety and operational standards (**United Nations, n.d.-d**).

The dynamic nature of maritime technologies, regulatory requirements, and operational practices requires continuous review and innovation within educational curricula. The Delphi method, employed in this study, harnesses expert insights to identify critical areas for improvement, such as practical training, academic curricula, and soft skills development, ensuring MET remains responsive to industry changes. This study aims to contribute actionable recommendations towards enhancing the quality of maritime education, thereby advancing seafarer professionalism and well-being in alignment with global sustainability and safety objectives.

Objectives

The research objectives of this study are to:

1. Identify key areas for improvement in maritime education and training based on expert opinions.
2. Propose recommendations to enhance existing training programs, focusing on practical training, academic curriculum, and soft skills development.
3. Contribute valuable insights to the maritime education sector to improve safety, efficiency, and professionalism within the industry.

By addressing these objectives, the study aims to provide actionable recommendations with broader applications for policy development in maritime education, ultimately enhancing the readiness and resilience of seafarers in the face of future challenges.

This research has implications for international policy development in maritime education and promotes a comprehensive approach to education that addresses social isolation and personal well-being. Specifically, it tries to answer the following question.

1. What are the specific areas for improvement in maritime education and training based on expert opinions?
2. How does the Delphi method contribute to the findings and recommendations of the research?
3. What are the broader implications of this study for maritime education and training policy development globally?

METHODS

Research Design

This study employed the Delphi method to systematically gather and refine the insights of maritime education and industry experts regarding the enhancement of education and training programs. The Delphi approach involved multiple iterative rounds of data collection, allowing experts to review anonymized feedback from their peers and revise responses to reach a consensus on key training priorities related to safety, professionalism, and seafarer well-being (Rowe & Wright, 2001; Taylor, 2020).

Participants

A purposive sampling technique selected ten subject matter experts (SMEs) with extensive experience and knowledge in maritime education, training, and safety. These participants included academic leaders, industry trainers, and policymakers, ensuring diverse perspectives relevant to seafarer competency development.

The sample size for this Delphi study consisted of a panel of ten experts in the maritime industry. This sample size is considered adequate for Delphi studies as it allows for in-depth discussions, diverse viewpoints, devoted to themselves to answering the same questions or engaging in multiple rounds of discussion (Ogbeifun, et al., 2016), and consensus-building among the participants. The selected experts had a proven track record in maritime education and training, ensuring the credibility and relevance of their input to the study.

Instrumentation

Structured questionnaires developed for the Delphi rounds focused on the evaluation of specific maritime training components. The key items presented to experts included rating and ranking proposed training programs across seven areas: (1) Actual training (hands-on, onboard simulations), (2) Academic curriculum enhancements, (3) Practical skills development, (4) Work-related skills, (5) Innovation in training methods, (6) Financial literacy, and (7) Professional development. Experts were asked to rate the importance of each area and provide qualitative feedback justifying their opinions. These items formed the basis for quantitative consensus analysis using Kendall's Coefficient of Concordance.

Procedure

The Delphi study consisted of multiple rounds. In round one, experts answered open-ended questions regarding skills acquired by seafarers, the application of those skills in current contexts, and suggestions for program improvements. Responses were collated and synthesized into summary statements. In subsequent rounds, experts rated and ranked the derived training program priorities, receiving anonymized summaries to inform revisions. This iterative process continued until convergence was reached.

Data Analysis

Quantitative data from expert rankings were analyzed with Kendall's W to assess the level of agreement across the seven training areas, while qualitative data from open-ended responses were thematically analyzed to elucidate underlying rationales. The combined analysis facilitated the identification of consensus recommendations for MET enhancement.

Ethical Considerations

Ethical considerations, such as informed consent, confidentiality, and respect for participants' opinions, will be strictly adhered to throughout the research process. The participants' privacy and anonymity will be protected, and their contributions were acknowledged and valued in the study.

Overall, this research methodology aims to engage experts in the maritime industry in a collaborative and iterative process to identify and recommend effective training programs for enhancing maritime education and ensuring the safety and professionalism of seafarers.

RESULTS

1. Identification of key areas for improvement in maritime education and training through expert opinions and consensus-building using the Delphi method.
2. Proposal of recommendations for enhancing existing training programs for seafarers, focusing on areas such as practical training, academic curriculum, professional development, and soft skills.
3. Emphasis on the importance of continuous improvement and innovation in maritime education to meet the evolving demands of the industry.
4. Recognition of the significance of accredited professional training in ensuring the safety, competency, and well-being of seafarers in the maritime sector.
5. Highlighting the need for multidisciplinary academic areas in maritime education that encompass ship management, essential universal abilities, and information for management trainees and deck cadets at sea.
6. Emphasis on the importance of addressing personal well-being and social isolation issues faced by seafarers through comprehensive maritime education programs.

DISCUSSION

The Delphi method facilitated a structured consensus-building process among maritime education experts, producing valuable insights into priority areas for enhancing seafarer training. The moderate Kendall's coefficient of concordance ($W = 0.309$) indicates a medium to strong level of agreement among the ten experts on the ranking of proposed training programs. This suggests that while diversity of opinions exists, there is a meaningful convergence regarding key educational priorities.

Qualitative feedback from the panel revealed strong support for "*Actual*" training—hands-on, real-world practical exercises—as the most critical component for equipping seafarers with essential operational skills. Experts emphasized the necessity of immersive experiential learning to build competencies that directly translate to safer and more effective performance at sea. The prominence of "*Academic*" curriculum enhancements as the second-highest ranked program reflects recognition of the importance of up-to-date theoretical knowledge, including contemporary maritime technologies and regulations.

The relatively lower rankings for "*Professional*" and "*Financial Literacy*" training highlight possible gaps in the current MET focus, yet qualitative comments underscored the emerging need to incorporate soft skills and personal development aspects such as resilience, accountability, and mental well-being. These competencies are increasingly vital in addressing challenges like social isolation and stress among seafarers, particularly in the post-pandemic context.

From a policy perspective, these findings advocate for a holistic reform of maritime education that balances technical skills, academic rigor, and soft skills development. International maritime regulatory bodies and training institutions should prioritize accreditation and continuous improvement of practical and academic curricula while embedding well-being and psychosocial support modules into training frameworks. By doing so, MET programs worldwide can better prepare seafarers for complex, evolving industry demands, promote safer maritime operations, and enhance overall workforce resilience.

Moreover, the use of the Delphi method in this study validates its effectiveness as a consensus tool for international maritime education stakeholders to collaboratively identify strategic priorities in the face of rapid technological and operational changes. Future policy development should leverage such expert-driven methodologies to continuously update training standards, ensuring adaptability and global harmonization in seafarer education and safety protocols.

In measuring the degree of agreement between different raters and goes from 0 to 1, Kendall's W , sometimes referred to as Kendall's coefficient of concordance was utilized. This is a non-parametric statistics with a score of 1 indicates complete agreement and 0 is no agreement at all (**Jeevanand, 2020**). Furthermore, the result from Kendall's Coefficient of Concordance, Kendall's W is 0.309.

Table 1*Related-Samples Kendall's Coefficient of Concordance Summary*

Statistic	Value
Number of Experts (N)	10
Kendall's W	0.309
Level of Consensus	Moderate Agreement

Table 2*Kendall's W Interpretation Scale (Van den Berg, 2024)*

Kendall's W Value	Interpretation
0.00 – 0.10	Negligible Agreement
0.11 – 0.30	Weak Agreement
0.31 – 0.50	Moderate Agreement
0.51 – 0.70	Strong Agreement
0.71 – 1.00	Very Strong Agreement

Table 1 shows the Kendall's Coefficient of Concordance Summary with Total N is 10 and Kendall's W is 0.309 and Table 2 presents the Kendall's Interpretation. It indicates that there was a medium to strong consensus among the ten experts. The panel of participants was given the opportunity to review and reflect on their thoughts in light of the input from other peers' viewpoints (**Physiopedia, 2024**).

It simply implies that agreement occurs in general because as per Standards of Training, Certification, and Watchkeeping for Seafarers (STCW) Convention, seafarers must have a minimum level of training in areas such as environmental awareness, personal safety, social responsibility, and medical fitness (**SQLearn, 2024**). Anyone seeking commercial employment aboard vessels longer than 24 meters, including super yachts and cruise ships, is legally required to complete the STCW Basic Safety Training course (**UKSA Sea.Change, 2024**). These basic trainings need to be completed by the seafarers before they can proceed with sailing.

However, when it comes to other trainings, programs, and seminars, it differs from one another because they come from various industry and academic institutions. It is crucial to comprehend the importance of the STCW Convention as well as its ramifications for individual jobs whether a mariner or an employer in the business. Countries are required to meet or surpass the minimum standards set forth in the Convention for seafarer certification, training, and watchkeeping (**International Maritime Organization, 2019**). After all, it is created to guarantee that all individuals working in the maritime industry are suitably qualified and trained in areas such as medical emergency response, social responsibility, firefighting, and personal safety to work on board ships (**Morley, 2023**).

In the end, understanding this convention will not only help one but will also work to make the marine industry safer for everyone involved (**SQLearn, 2024**).

Table 3*Related-Samples Kendall's Coefficient of Concordance*

Program Category	Mean Rank
Actual Training	5.70
Academic Training	5.20
Practical Training	4.50
Work-Related Training	3.80
Innovation	3.50
Financial Literacy	2.90
Professional Training	2.40

Table 3 presents the programs that should be proposed to maritime institutions. It can be seen from the figure that the highest mean rank belongs to Actual with 5.70 mean, second is Academic with 5.20 mean, third is Practical with 4.50 mean, fourth is Work-Related with 3.80 mean, fifth is Innovation with 3.50 mean, sixth is Financial Literacy, and seventh is Professional with 2.40 mean. Likewise, this can also be seen from the pairwise comparisons (Figure 4). **Lau & Ng (2015)** said that maritime education is a multidisciplinary academic area that includes ship management, humankind's essential universal abilities, and information for management trainees in businesses and deck cadets at sea. This profession put high regard to the safety and security of passengers and cargoes. The marine sector needs accredited professional training to ensure that workers have the knowledge and abilities to handle the intricacies of their jobs and maintain maritime safety (Galileo Maritime Academy, 2022).

Table 4*Pairwise Comparisons*

Comparison	Significance
Actual vs. Professional	Significant
Actual vs. Financial Literacy	Not specified
Actual vs. Innovation	Not specified
Academic vs. Professional	Not specified
Practical vs. Professional	Not specified
Work-Related vs. Professional	Not specified
Innovation vs. Financial Literacy	Not specified

Table 4 presents the pairwise comparisons among the seven proposed maritime training programs, highlighting which specific program pairs differ significantly in expert rankings. The results indicate that Actual Training and Professional Training show a statistically significant difference, suggesting that experts prioritized hands-on experiential learning more strongly than traditional professional training components (**Jeevanand, 2020**;

Physiopedia, 2024). Edirisinghe, Jayakody, Ranwala & Shen (2016) pointed out that it has grown to be a significant issue in the current environment as some types of seafarers are unable to board ships after completing their initial college training, therefore, actual and professional training should be observed to maintain the general health, practical abilities, and competency of all seafarers, high-quality training is essential. In turn, this helps to maintain the safety of the ships, the environment, and trade **(The Mission To Seafarers, 2024)**.

This distinction reinforces the importance of practical, real-world skill development in maritime education, aligning with industry competency requirements. Other comparisons were not explicitly reported as significant, implying relatively comparable perceptions across the remaining program categories. Overall, the pairwise analysis supports the conclusion that experiential training is a critical focus area for improving maritime education and training systems.

Table 5

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.a,b	Decision
1	The distribution of Work-related, Professional, Practical, Actual, Academic, Innovation, and Financial Literacy are the same	Related-sample Kendall's Coefficient of Concordance	0.005	Reject the null hypothesis

Notes: a. The significance level is 0.05

b. Asymptotic significance is displayed

The table above shows the decision in Hypothesis Test Summary. It can be seen from the table that there was a significant level in the distribution of seven suggested maritime programs particularly in the work-related, professional, practical, actual, academic, innovation, and financial literacy. In improving academic and soft skills, the multi-discipline seafarers should emphasized the future-proofing abilities for shipping such as general IT systems and networking, and system-specific training and cyber security **(Safety4Sea, 2022)**. Similar statements can be drawn from **Erdogan, O. and Demirel, E. (2017)** when they said that utilizing the new chances provided by technology and cutting-edge coordinating techniques, they may raise the standard of maritime education and training (MET) globally.

The findings of this study shed light on the critical aspects of maritime education and training that are essential for the professional development, safety, and well-being of seafarers in the maritime industry. Through the Delphi method, experts in the field have provided valuable insights and recommendations for improving existing training programs and initiatives to meet the evolving needs of the sector.

One of the key outcomes of this study is the identification of specific areas for enhancement in maritime education, including practical training, academic curriculum, professional development, and soft skills. The consensus among experts on the importance of these areas highlights the need for a comprehensive and holistic approach to training programs that go beyond technical skills to encompass broader competencies essential for success in the maritime profession.

The emphasis on accredited professional training in ensuring the safety and competency of seafarers underscores the industry's commitment to maintaining high standards of training and education. By prioritizing ship

management, essential universal abilities, and information for management trainees and deck cadets at sea, maritime education programs can better prepare individuals for the challenges and responsibilities they will face in their roles.

Furthermore, the recognition of personal well-being and social isolation issues faced by seafarers highlights the importance of incorporating holistic approaches to education that address not only technical skills but also mental health and social support. By integrating these requirements into training programs, maritime education can better equip individuals with the skills and competencies needed to thrive in a dynamic and demanding industry.

Overall, the findings of this study underscore the importance of continuous improvement and innovation in maritime education and training to meet the evolving needs of the industry. By incorporating the insights and recommendations of experts, maritime education programs can better prepare seafarers for success in their roles while prioritizing safety, professionalism, and well-being in the maritime sector.

CONCLUSION

This study highlights the urgent need to reform maritime education and training through a balanced integration of technical skills, soft skills, and well-being initiatives. The Delphi findings emphasize the importance of experiential learning, curriculum modernization, and continuous professional development. By adopting a holistic approach, maritime institutions can enhance the competency, safety, and resilience of seafarers, ensuring readiness for future global challenges.

RECOMMENDATIONS

1. **Enhance Practical Training:** Implement hands-on practical training programs that simulate real-world scenarios to equip seafarers with the skills and experience necessary for safe and efficient operations at sea.
2. **Strengthen Academic Curriculum:** Update and enhance academic curricula to incorporate the latest industry trends, technologies, and best practices, ensuring that seafarers are well-prepared for the complexities of modern maritime operations.
3. **Focus on Professional Development:** Provide opportunities for ongoing professional development and skills enhancement to empower seafarers to advance their careers and stay abreast of industry developments.
4. **Incorporate Soft Skills Training:** Integrate soft skills training, such as resilience, accountability, and self-management, into maritime education programs to foster well-rounded and adaptable seafarers.
5. **Address Personal Well-Being:** Develop initiatives to support the personal well-being of seafarers, including mental health awareness, social support systems, and resources for coping with the challenges of life at sea.

By implementing these recommendations and prioritizing continuous improvement and innovation in maritime education and training, stakeholders in the maritime industry can enhance the professionalism, safety, and effectiveness of seafarers, ultimately contributing to a more resilient and sustainable maritime sector.

REFERENCES

- Brooks, S. K., & Greenberg, N. (2022). Mental health and wellbeing of seafaring personnel during COVID-19: A scoping review. *Journal of Occupational Health*, 64(1), Article e12361. <https://doi.org/10.1002/1348-9585.12361>
- CFI Team. (2024, May 11). *Delphi method*. Corporate Institute. <https://corporatefinanceinstitute.com/resources/economics/delphi-method>
- Edirisinghe, L., Jayakody, N., Ranwala, L., & Shen, L. (2016). *Factors that determine students' choice of maritime education and training with special reference to seafaring officers* [Paper presentation]. Dalian Maritime University International Conference on Maritime Education and Training, Dalian, China.
- Erdogan, O., & Demirel, E. (2017). New technologies in maritime education and training: Turkish experiment. *Universal Journal of Educational Research*, 5(6), 947–952. <https://doi.org/10.13189/ujer.2017.050606>
- Galileo Maritime Academy. (2022). *International maritime academy*. <https://galileomaritimeacademy.com>
- International Maritime Organization. (2019). *International convention on standards of training, certification and watchkeeping for seafarers (STCW)*. <https://www.imo.org>
- Jeevanand, E. (2020). *Kendall's coefficient of concordance*. U.C. College. <https://esjeevanand.uccollege.edu.in>
- Lau, Y., & Ng, A. K. Y. (2015). The motivations and expectations of students pursuing maritime education. *WMU Journal of Maritime Affairs*, 14, 313–331. <https://doi.org/10.1007/s13437-015-0085-7>
- Morley, L. (2023). *Why take STCW basic training*. Maritime Professional Training. <https://www.mptusa.com/news/why-take-stcw-basic-training>
- Ogbeifun, E., Agwa-Ejon, J., Mbohwa, C., & Pretorius, J. H. C. (2016). *The Delphi technique: A credible research methodology* [Conference paper]. Proceedings of the International Conference on Industrial Engineering and Operations Management, Detroit, Michigan.
- Physiopedia. (2024). *Delphi method*. https://www.physio-pedia.com/Delphi_method
- Rowe, G., & Wright, G. (2001). Expert opinions in forecasting: The role of the Delphi technique. In J. S. Armstrong (Ed.), *Principles of forecasting: A handbook for researchers and practitioners* (pp. 125–144). Kluwer Academic Publishers. https://doi.org/10.1007/978-0-306-47630-3_7
- Safety4Sea. (2022). *Boosting seafarers' skills: Key considerations for the future of training*. <https://safety4sea.com>
- Sliskovic, A. (2020). Seafarers' well-being in the context of the COVID-19 pandemic: A qualitative study. *International Journal of Occupational Safety and Ergonomics*, 28(4), 2351–2361. <https://doi.org/10.1080/10803548.2020.1843494>

- SQLearn. (2024). *What is STCW? Standards of training, certification, and watchkeeping for seafarers*.
<https://www.sqlearn.com>
- Taylor, E. (2020). We agree, don't we? The Delphi method for health environments research. *HERD: Health Environments Research & Design Journal*, 13(1), 11–23. <https://doi.org/10.1177/1937586719887413>
- The Mission to Seafarers. (2024). *The importance of training in soft skills for seafarer wellbeing*.
<https://www.missiontoseafarers.org>
- Twin, A. (2024, April 20). *What is the Delphi method and how is it useful in forecasting?* Investopedia.
<https://www.investopedia.com/terms/d/delphi-method.asp>
- United Nations. (n.d.-a). *Goal 3: Ensure healthy lives and promote well-being for all at all ages*. Department of Economic and Social Affairs, Sustainable Development. https://sdgs.un.org/goals/goal3#targets_and_indicators
- United Nations. (n.d.-b). *Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all*. Department of Economic and Social Affairs, Sustainable Development.
https://sdgs.un.org/goals/goal4#targets_and_indicators
- United Nations. (n.d.-c). *Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all*. Department of Economic and Social Affairs, Sustainable Development.
https://sdgs.un.org/goals/goal8#targets_and_indicators
- United Nations. (n.d.-d). *Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development*. Department of Economic and Social Affairs, Sustainable Development.
https://sdgs.un.org/goals/goal14#targets_and_indicators
- Van den Berg, R. (2024). *Kendall's tau: Simple introduction*. SPSS Tutorials. <https://www.spss-tutorials.com>