Examining Relationship Between Knowledge and Behaviour of Seafarers

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Abstract-
Within the scope of this study, the knowledge, attitude, and conduct of sailors about safety are investigated. The purpose of this study is to reveal the underlying dynamics that shape maritime practices by conducting a comprehensive examination of the elements that influence safety results at sea. These factors include gender, experience, and education. The purpose of this research is to give significant insights into techniques for establishing a culture of safety, professionalism, and continuous improvement within the marine sector. These insights are provided by investigating the interplay between cognitive understanding, mentality, and behaviors. Consequently, it is anticipated that the characteristics that were discovered in this study would be utilized in maritime institutions in order to add areas that are intended to instill the appropriate attitudes among seafarers. The findings, in the end, contribute to the improvement of safety measures, the reduction of hazards, and the protection of the well-being of seafarers and the maritime environment.

Keywords: Knowledge, Attitude, Behavior, Seafarer, Safety.

I. INTRODUCTION

For the purpose of improving safety, efficiency, and well-being in the maritime sector, it is essential to have a comprehensive understanding of the complex link that exists between knowledge and conduct among seafarers. The environment in which seafarers work is one that is both dynamic and stressful, and decisions that are made under duress can have enormous repercussions not just for themselves but also for their crewmates and the maritime ecology. In addition to providing significant insights into the elements that shape maritime practices, the examination of how knowledge impacts behavior and vice versa also provides valuable insights into the techniques that may be used to promote a culture of safety and professionalism at sea.

An examination of the junction of cognitive knowledge, practical abilities, and psychological elements that influence the behaviors and decisions of seafarers is at the heart of this investigation. The term "knowledge" comprises not just formal education and training but also learning via experience, cultural norms, and regulatory frameworks that regulate marine activities. The comprehension of navigation protocols, tactics for vessel handling, emergency procedures, and conformity with international maritime standards are all included in this. The translation of information into conduct, on the other hand, is impacted by a wide variety of factors, such as individual attitudes, perceptions of risk, corporate culture, and the environment of the circumstance.

The purpose of this preliminary inquiry is to investigate the intricate relationship that exists between the acquisition of information, its retention, its application, and the behavioral patterns that are observed among seafarers. We are able to find opportunities for improvement in training programs, crew management methods, and safety regulations by conducting an investigation into the ways in which information impacts decision-making processes, risk assessment, and operational practices onboard boats. In a similar vein, gaining an understanding of the influence that behavior has on the acquisition of information, the development of skills, and the culture of safety may provide valuable insights for the creation of interventions that aim to reduce the occurrence of human error, encourage adherence to best practices, and cultivate a culture of continuous learning and improvement within the maritime community.

Because it has a direct influence on the safety, efficiency, and sustainability of maritime operations, it is

impossible to emphasize the relevance of knowing the knowledge and conduct of seafarers. The following are many major points that emphasize the significance of it:

1. Safety at Sea: Knowledgeable and well-trained seafarers are essential for ensuring the safety of maritime operations. Understanding navigational procedures, emergency protocols, and vessel handling techniques is crucial for preventing accidents, minimizing risks, and responding effectively to unforeseen events such as adverse weather conditions or equipment failures.
2. Risk Management: The behaviour of seafarers plays a significant role in risk management onboard vessels. A comprehensive understanding of safety procedures, coupled with prudent decision-making and adherence to best practices, helps mitigate risks associated with human error, environmental hazards, and operational challenges.
3. Environmental Protection: Seafarers' behaviour can have profound implications for the marine ecosystem. Knowledge of environmental regulations, pollution prevention measures, and sustainable practices is essential for minimizing the ecological footprint of maritime activities and preserving marine biodiversity.
4. Operational Efficiency: Efficient maritime operations rely on knowledgeable and skilled seafarers who can optimize vessel performance, navigate efficiently, and manage resources effectively. Behaviour-based interventions, such as promoting teamwork, communication, and problem-solving skills, contribute to enhancing operational efficiency and productivity at sea.
5. Compliance and Regulation: Compliance with international maritime regulations and industry standards is paramount for ensuring the integrity and reputation of the maritime industry. Seafarers' knowledge of regulatory requirements, coupled with ethical behaviour and professionalism, is essential for upholding maritime law, preventing regulatory violations, and maintaining the industry's credibility.
6. Crew Well-being and Morale: The knowledge and behaviour of seafarers also impact crew dynamics, morale, and well-being onboard vessels. Promoting a culture of safety, respect, and inclusivity fosters a positive work environment, enhances job satisfaction, and reduces the risk of accidents, injuries, and fatigue-related incidents.
7. Global Trade and Economy: The smooth functioning of maritime transportation is critical for global trade and economic prosperity. Knowledgeable and competent seafarers play a vital role in facilitating the movement of goods and commodities across international waters, supporting economic growth, and fostering international cooperation and trade relations.

In summary, the significance of understanding the knowledge and behaviour of seafarers extends far beyond individual vessels or maritime companies. It encompasses broader implications for safety, environmental protection, regulatory compliance, crew well-being, and global trade. By prioritizing investments in education, training, and behavioural interventions, stakeholders can cultivate a culture of excellence, professionalism, and sustainability within the maritime industry, ensuring its resilience and vitality in the face of evolving challenges and opportunities.

II. REVIEW OF RELATED STUDIES

Pantouvakis, Angelos (2020) Research in the marine sector studies the influence of leadership and talent on the long-term success of the company. Based on Service Dominant Logic (SDL), a large-scale survey of 308 shipping organizations was conducted in 2018 to support this empirical study. Analyses revealed that there are four distinct leadership styles (authoritarian, stakeholder-based, formal, and growth-oriented), four distinct talent categories (and their management), two distinct organizational cultures (formal, and learning-oriented), and five distinct facets of sustainability (environmental resources, environmental impact, environmental compliance, social sustainability, economic sustainability). More than leadership, talent has an influence on sustainability success. The talent-sustainability connection is moderated by organizational culture, while the leadership-sustainability relationship is not.

D. Dalaklis (2020) Because of the "Industrial Revolution," a wide range of technological advances have come into play in the shipping business. Shipbuilding techniques and ship equipment have developed dramatically throughout time. A new operational environment for shipping has been formed over the last several decades as a result of the constant development and connectivity of electronic systems (the "network-centric" approach). Due to the current buzz around the potential for digitization and self-driving vessels, it is no accident that this sector is poised to undergo a seismic shift in the near future. Seagoing

boats in the modern day are extremely sophisticated and highly automated. In order to safely and successfully do their assigned responsibilities, the systems supporting navigation and the many IT applications connected to ship management are largely dependent on real-time information today. Clearly, connectivity and interoperability are important considerations. Navigating in the near future is a critical consideration. To begin, we will use a qualitative technique to identify and briefly describe a number of technical breakthroughs that follow a network-centric design and have recently been released as equipment suitable for ships. This will serve as the essential "literature review." Using interactive processes and applications, both onshore and onboard vessels, as part of the so-called "net-centric" framework of operations, it will look at how these processes and applications can improve the working environment for seafarers and help shore side personnel better understand what is happening at sea. Furthermore, the evaluation of these potential technical developments in terms of their ability to be adopted within the wider marine transport area is an essential goal of this study. Net-centric mindset and related software applications may actually break through any current limits and create a collaborative environment for humans as well as "things," including remotely piloted unmanned boats.

Yuen, Kum Fai (2019) Shipping firms must deal with the subject of sustainability management on a regular basis. Resource theories are used to build a taxonomy of resources that enhances sustainable shipping management and explore their interrelationships and implications on sustainable shipping management and company performance. Structural equation modeling was used to analyze survey and financial data from 162 shipping businesses. In trafirm, interfirm relationship management, and organizational learning resources are the three types of resources that contribute to a company's ability to manage its shipping operations sustainably. Our results have theoretical and managerial ramifications, which we explore in this paper.

YUSUKE MORI (2014) It was decided in Manila in 2010 to revise the 1978 International Convention on Standards of Training, Certification, and Watch keeping for Seafarers (STCW) There were a number of changes made as a result of these modifications, including a new obligation for reporting. Rank-and-file sailors are given leadership training. Courses are now being offered in a variety of formats. Maritime Education and Training Institutions (METI) have been created in order to meet this need for leadership development. However, it seems that there is a lack of information. Improvements may and should be made. The topic of this dissertation is leadership. METI education and instruction. The research is centered on philosophical methods to understanding training in leadership A first assessment of the literature focuses on the definitions and basic concepts of leadership. in-depth examination of maritime-specific competencies and training programs Respondents' views on a variety of topics are explored via questionnaires and interviews. Considering the philosophic approach to leadership education and viewpoints on training. It points out the difficulties that arise from the great range of viewpoints that people have. leadership and the requisite abilities that go along with it. The study's conclusion is based on data analysis and a literature assessment.

Vito, Gennaro (2014) Three distinct versions of the Leadership Challenge model will be examined in this article to see whether they better represent transactional or transformative leadership. The literature was used to develop the three models. Self-report questionnaires of middle managers who are enrolled in the Administrative Officers Course at the Southern Police Institute are used to gather data for this research project. The managers completed a 30-item 360-degree leadership challenge. Because the leadership challenge measure is a 360-degree assessment of leadership, up to five observers were able to contribute data about their boss. To conduct this study, researchers rely on information provided by an observer. In this study, the authors used structural equation modeling to investigate the goals. Observations - The observations reveal two significant advancements. Transformative and transactional leadership are both included in the leadership challenge paradigm. It also seems from these data that transformative leadership is, in fact, captured by this particular metric. In terms of originality and value, this is the first time this sort of investigation has been done in the police literature, according to the authors. This sort of inspection has a significant monetary value.

III. RESEARCH METHODOLOGY

Descriptive research approach was followed in this study. A sample of 120 seafarers was taken as respondents. Data analysis was carried out via Confirmatory Factor Analysis(CFA).This is a procedure

conducted for testing hypotheses via statistic almeans in order to identify the commonality among the variable.

IV. RESULTS AND DISCUSSION

Demographic

Table1:Demographicprofileoftheparticipants(N=150)

Particular	Frequency	Percentage
Gender		
Male	120	80.0
Female	30	20.0
Total	150	100.0
Educational degree		
Certificate	33	22.0
Diploma	45	30.0
Graduation	57	38.0
Post-Graduation	15	10.0
Total	150	100.0
Durationofservice		
Less than 5 years	96	64.0
5-10 years	24	16.0
Notrelevant	15	10.0
Total	150	100.0

This table provides insights into the demographic characteristics, educational background, and duration of service of a group of individuals.

In terms of gender, there were 120 males (80.0%) and 30 females (20.0%) out of a total of 150 individuals. Regarding educational degree, the majority of individuals had either a Diploma (45, 30.0%) or Graduation (57, 38.0%) degree. A smaller proportion had a Certificate (33, 22.0%) or Post-Graduation (15, 10.0%) degree. When considering the duration of service, the largest proportion of individuals had less than 5 years of service (96, 64.0%), followed by those with 5-10 years of service (24, 16.0%). A smaller portion had service durations considered not relevant (15, 10.0%).Overall, these findings provide a snapshot of the demographic, educational, and professional profiles of the individuals included in the study.

Confirmatory Factor Analysis (CFA)

In general, the purpose of employing CFA is to evaluate the hypotheses that have been made concerning the extent to which the indicator variables represent the latent variables. This is accomplished through the use of AMOS SPSS. In the subsequent study, this is accomplished by establishing whether or not the conceptions in question have convergent validity.

The following should be used to provide support for the convergent validity: (1) standardised factor loading (standardized regression weight); (2) p-value; (3) construct or composite reliability; and (4) average variance extracted (AVE). Within the scope of this investigation, it was determined that the p-values and standardized factor loadings for the items were statistically significant, with a p-value of less than 0.001 (***= $p < 0.001$). In addition, the findings of the construct reliability varied from 0.844 to 0.949, which led to the conclusion that the construct reliability should be considered good because the values above the crucial threshold that is suggested, which is 0.7. In the meanwhile, the average variance extracted (AVE) for all constructs fell within the range of 0.401 to 0.495, which was lower than the required value of 0.5 for the entire set. On the other hand, the convergent validity was deemed to be satisfactory because an AVE value of 0.4 was generally thought to be acceptable in cases when the composite reliability (construct validity) was more than 0.6. Prior to the data being transferred from SPSS to AMOS SPSS, a Mahalanobis distance calculation was performed in order to detect any outliers. A total of 67 outliers were found and then unselected from the SPSS data.

With the help of the following four constructs, the conceptual model of the current research has been

effectively verified.

- Shipboard safety education
- Shipboard safety knowledge
- Shipboard safety attitude
- Shipboard safety behavior.

Below is a table that has a list of the criteria that were used to measure the constructions.

Table 2:Results of CFA (Convergent validity test)

Construct/factors	Item	Standardized factor loading	p-Value *** p < 0.001	Construct reliability	Average variance extracted
Education					
1. Elementary first aid	SE13 SE17	.722 .709	*** ***	0.844	0.401
2. Personal safety and social responsibility	SE21	.539	***		
3. Fire prevention and fire fighting	SE10	.593	***		
4. Fire-fighting and life-saving appliances	SE6 SE7	.679 .711	*** ***		
5. Survival equipment	SE4	.704	***		
6. Personal survival technique	SE1 SE3	.422 .585	*** ***		
Knowledge					
1. Elementary first aid	SK15 SK17 SK18	.756 .742 .736	*** *** ***	0.899	0.472
2. Fire prevention and fire fighting	SK7 SK8 SK21	.725 .718 .675	*** *** ***		
3. Personal survival technique	SK1 SK2 SK3	.681 .593 .629	*** *** ***		
4. Personal safety and social responsibility	SK20	.592	***		
Attitude					
1. Perception on teamwork and leadership	SA2 SA9 SA10 SA17 SA19	.732 .681 .588 .630 .685	*** *** *** *** ***	0.904	0.425
2. Management safety commitment	SA14 SA22 SA24	.708 .707 .671	*** *** ***		
3. Work pressure	SA3 SA25	.711 .389	*** ***		

4. Uncertainty avoidance	SA15	.598	***		
5. Contribution	SA1 SA11	.671 .621	*** ***		
Behaviour					
1. Learn and develop	SB53 SB54 SB55	.663 .733 .734	*** *** ***	0.949	0.495
2. Leadership and managerial skill	SB7 SB10 SB11 SB35 SB42	.686 .723 .737 .690 .729	*** *** *** *** ***		
3. Situational awareness	SB20 SB22 SB34 SB41	.781 .779 .748 .748	*** *** *** ***		
4. Result focus	SB29 SB37 SB40	.683 .521 .679	*** *** ***		
5. Decision-making	SB8 SB24	.749 .629	*** ***		
6. Team working	SB1	.619	***		
7. Communication and influencing	SB15	.681	***		

This study indicates that the factors contributing to shipboard safety education construct for seafarers are as follows: "Elementary First Aid," "Personal Safety and Social Responsibility," "Fire Prevention and Fire-Fighting," "Fire-Fighting and Life-Saving Appliances," "Survival Equipment," and "Personal Survival Technique." The findings of this study are based on the outcomes of the CFA. While this is going on, the shipboard safety knowledge construct is reinforced by the following factors: "Elementary First Aid," "Personal Safety and Social Responsibility," "Fire Prevention and Fire-Fighting," and "Personal Survival Technique.".

V. CONCLUSION

In conclusion, the impact of basic training on seafarers' safety knowledge, attitude, and behavior is profound and multifaceted. Basic training serves as the foundation upon which seafarers build the essential skills, competencies, and mindset necessary for safe and effective maritime operations. Through a combination of theoretical learning, practical exercises, and experiential training, basic training programs aim to equip seafarers with the knowledge, confidence, and resilience to navigate the challenges of the maritime environment. However, the impact of basic training on seafarers' safety knowledge, attitude, and behavior extends beyond the individual level to encompass broader implications for organizational safety culture, regulatory compliance, and industry resilience. Basic training serves as a cornerstone of a robust safety management system, reinforcing the importance of continuous training, supervision, and evaluation to maintain safety standards and prevent incidents in the maritime industry.

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