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An Assessment of Shipboard Training Deployment among Shipping Companies

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ABSTRACT

This study assessed the deployment of maritime cadets for shipboard training, focusing on the preferred cadet profile and the challenges faced by shipping companies in the selection process. A descriptive correlational method was employed, using a researcher-made questionnaire distributed to 15 local and 5 international shipping companies through convenient sampling. The data were analyzed using frequency, Chi-Square correlational tests, and mean. The findings revealed that shipping companies favored cadets aged 20-21, male, single, regular class attendees, and recognized by private institutions. Companies prioritized cadets with foundational knowledge in English, Mathematics, Science, and core competencies outlined in Table AII/1 and Table III/1 of the STCW Code 1978, as amended. A significant challenge identified was cadets withdrawing mid-deployment. Additionally, there was a significant relationship between English proficiency and the age of the preferred cadet profile. To ensure successful shipboard deployment, it was recommended that cadets possess strong foundational knowledge in key subjects and competencies and adhere to policies to complete their training, as these were critical factors for shipping companies when selecting qualified candidates for shipboard training.

1. Introduction.

Shipboard training is a critical phase in the professional development of maritime cadets, serving as a bridge between theoretical education and real-world application at sea(Miyusov et al.,2022). The success of cadets in this training is vital, not only for their career progression but also for ensuring safety, operational efficiency, and compliance with international maritime standards (Skaar,2023). As such, shipping companies play a crucial role in the selection of cadets for shipboard training, ensuring that only the most competent and prepared individuals are deployed.

This selection process is guided by various factors, including the academic background, core competencies, and personal attributes of the cadets. Maritime training institutions and regulatory frameworks like the Standards of Training, Certification, and Watchkeeping for Seafarers (STCW) Code 1978, as amended, establish foundational requirements that cadets must meet. However, shipping companies often have specific preferences when it comes to the ideal cadet profile, further shaping the selection and deployment process.

Given the dynamic demands of the maritime industry, it is essential to assess how shipping companies select cadets and identify the challenges they face during the deployment process. Understanding these factors can inform maritime education and training programs, aligning them more closely with the needs of the industry and enhancing the readiness of cadets for their future roles at sea.

2. Research Questions.

1. What is the preferred profile of recognized maritime cadets for shipboard training deployment in terms of age, gender, civil status, cadet class, and school attended?

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2. What academic factors are preferred by respondents for shipboard training deployment of recognized cadets in terms of knowledge (English, mathematics, science) and core competencies (Table A II/1 and Table A III/1)?
3. What challenges are encountered by respondents in the selection of cadets for shipboard training deployment?
4. Is there a relationship between the preferred profile of recognized cadets and the academic factors that affect their deployment?

3. Literature Review.

The maritime industry relies heavily on effective training programs to ensure that cadets are well-prepared for the complexities of shipboard operations. Shipboard training deployment, as a critical component of maritime education has been widely discussed in academic research due to its importance in bridging theoretical knowledge with practical skills (Boulougouris et al., 2019). This review synthesizes and critically examines existing studies related to shipboard training deployment focusing on the challenges, best practices, and the evolving landscape in maritime training.

Shipboard training is an essential phase in maritime education often regarded as the bridge between classroom learning and real-world application (Miyusov et al.,2022). It has been widely noted that cadets' performance in shipboard training directly influences their professional competence and readiness for future careers at sea. According to Voloshynov (2019), shipboard training allows cadets to develop technical skills, interpersonal communication, and adaptability in a dynamic environment. However, despite its critical role several studies highlight significant challenges in the deployment of such training programs particularly concerning logistical constraints and standardization (Eruguz et al.,2017; Paciarotti et al., 2021).

Furthermore, several literature presents key challenges in the effective deployment of shipboard training. One persistent issue is the disparity in training standards and resources available across different shipping companies. As noted by Abila (2016), some cadets face difficulties in securing placements on vessels that offer comprehensive training experiences. This results in varying levels of competency among cadets, which is further compounded by the lack of uniform assessment criteria. Moreover, Magsino et al. (2023) emphasized the need for better coordination between maritime academies and shipping companies to ensure that training objectives align with the actual tasks cadets encounter on board.

Another critical concern is the mental and emotional well-being of cadets during shipboard training. Brooks and Greenberg (2022) found that the isolation and demanding work schedules on board can lead to increased stress and anxiety, which in return it affects the learning of the students. They suggest incorporating mental health support programs as part of the shipboard training framework to address these challenges.

Additionally, Research study reveals that several best practices that can enhance the effectiveness of shipboard training deployment. One frequently cited strategy is the implementation of structured mentorship programs on board. Bogusławski et al. (2022) argue that having experienced officers mentor cadets helps bridge the gap between theoretical knowledge and practical skills. Such mentorship provides cadets with real-time feedback, fostering professional development in a supportive learning environment.

Technological integration in shipboard training has shown promising results. According to Skaar(2023), the use of simulation - based training prior to deployment can significantly enhance the readiness of cadets for real-world operations. Maritime instructors often prefer to use simulators in teaching maritime courses due to their ability to effectively replicate real-world scenarios, thereby improving cadets' practical skills and learning outcomes (Diamante et. al., 2024). These simulations allow cadets to practice critical scenarios, which they may later encounter on actual vessels, reducing the steep learning curve often faced in the first weeks of shipboard deployment.

With advancements in maritime technology and global regulatory changes, the landscape of shipboard training is continuously evolving. Tabora (2023) notes that new international safety and environmental regulations, such as those mandated by the International Maritime Organization (IMO) require that cadets are proficient in handling modern navigational equipment and understanding sustainability practices. This shift necessitates the inclusion of new topics in shipboard training programs, such as energy efficiency management and emissions reduction technologies (Jimenez et al., 2022).

Additionally, the impact of digitalization on maritime training has been profound. Remote monitoring systems and the digitalization of ship operations have introduced new competencies that cadets must master during their training. As pointed out by Demirel (2020), this digital shift demands a revamp of traditional training models to integrate digital tools, thus ensuring cadets can operate and troubleshoot advanced technological systems on board.

4. Research Method.

The study utilized a quantitative descriptive method to examine shipping companies in Cebu City, with crewing managers as the participants. Convenient sampling was employed for selection. A custom-designed questionnaire was used to evaluate various aspects of shipboard training, including the ideal profile of maritime cadets, academic factors influencing training, and challenges in cadet deployment. The questionnaire underwent pre-testing for reliability, achieving a Cronbach's Alpha of 0.998. Data analysis involved frequency analysis to identify cadet profiles and challenges, the Chi-Square Test to investigate relationships between cadet profiles and academic factors, and mean calculations to assess the preferred academic factors for shipboard training deployment.

5. Findings and Discussion.

RQ1. What is the preferred profile of recognized maritime cadets for shipboard training deployment in terms of age, gender, civil status, cadet class, and school attended?

Table 1: Preferred profile of maritime cadets for Shipboard Training Deployment.

VARIABLES		FREQUENCY	PERCENT
AGE (in Years)	18 to 19	1	5
	20 to 21	19	95
	22 to 24	0	0
	25-above	0	0
SEX	Male	20	100
	Female	0	0
CIVIL STATUS	Single	20	100
	Married	0	0
CADET CLASS	Regular	14	70
	Scholar	6	30
SCHOOL TYPE	Public	3	15
	Private	17	85

Source: Authors.

The results reveal that most shipping companies preferred maritime cadets aged 20-21 years (95%), compared to only 5% for ages 18-19. This preference suggests that younger cadets are favored for their adaptability and fewer complaints. The study also shows a strong preference for male cadets reflecting the traditionally male-dominated maritime industry, despite recent efforts to include more women.

In terms of civil status, single cadets are preferred due to their fewer personal obligations, allowing them more flexibility and focus on their duties. Regarding cadet type, regular students are favored (70%) over scholar students (20%), as regular students are seen as more compliant with company policies, despite some potential theoretical shortcomings.

Additionally, shipping companies prefer cadets from private schools (85%) over public schools. This preference is based on the perceived superior quality of education and hands-on experience provided by private institutions, which better prepares cadets for onboard tasks. Public school cadets often face challenges due to less access to equipment and practical training.

RQ2. What academic factors are preferred by respondents for shipboard training deployment of recognized cadets in terms of knowledge (English, mathematics, science) and core competencies (Table A II/1 and Table A III/1)?

Shipping companies prioritize various knowledge areas for maritime cadets. English is highly valued due to its crucial role in international maritime communication and operations. Mathematics is also preferred, with its application in ship stability and navigation, while science is essential for understanding maritime technologies and safety. Additionally, knowledge in Navigation at the Operational Level and cargo handling is highly sought after, reflecting the importance of these skills in ensuring safe and efficient vessel operations. Bridge Resource Management and the use of navigational equipment are also preferred, though to a slightly lesser extent. Competency in Marine Engineering, including electrical core competencies and maintenance and repair, is essential as it ensures the effective operation and repair of shipboard systems.

RQ3. What challenges are encountered by respondents in the selection of cadets for shipboard training deployment?

The number one challenges faced by shipping companies in selecting maritime cadets is their tendency to withdraw midway through their utility period. This often occurs because cadets do not receive allowances and their time is not counted as sea service, despite their work for the company. Additionally, some cadets may leave for other companies with earlier deployment schedules due to frustration with the waiting period.

The second challenges is the cadets' non-compliance with company policies. Frequent disputes, and challenging behavior. This suggests that maritime cadets may lack familiarity with company policies and may not have received adequate training on adapting to and functioning effectively in a professional environment.

Another significant issue is the lack of financial assistance from parents for processing necessary documents. Many cadets face financial difficulties because their parents cannot cover these expenses, or because they are working students struggling to finance their shipboard training. This financial strain can prevent cadets from completing their training.

A further pro is the tendency of some cadets to marry shortly after graduation, often due to unplanned pregnancies. This indicates a lack of preparation and seminars on life management and premarital issues, leading some to make hasty decisions about marriage without proper life planning.

The least common problem is a lack of knowledge, suggesting that most maritime cadets are generally competent and skilled in maritime education despite an occasional instances of

Table 2: Factors (Basic Knowledge).

English	Mean	Interpretation
1. Can write English clearly and effectively.	3.91	Highly Preferred
2. Proficient in English Communication Skills.	3.91	Highly Preferred
3. Able to carry on an English conversation about everyday Life.	3.91	Highly Preferred
4. Be able to know the Subject Verb Agreement.	4.00	Highly Preferred
5. Good reading comprehension skills	4.00	Highly Preferred
Totality	**3.95**	**Highly Preferred**
Mathematics	Mean	**Interpretation**
1.Understand how mathematics is used in maritime careers	4.00	Highly Preferred
2. Knowledgeable on mathematical concepts, principles, and strategies to apply in maritime career.	4.00	Highly Preferred
3. Easily Remembered mathematical Formulas and procedures.	4.00	Highly Preferred
4. Be able to provide reasons to support their solutions.	4.00	Highly Preferred
5. Good logical reasoning, analytical and thinking skills can solve problem systematically.	4.00	Highly Preferred
Totality	**4.00**	**Highly Preferred**
Science	Mean	**Interpretation**
1. Good in understanding science concepts, principles and strategies.	4.00	Highly Preferred
2. be able to think creatively	4.00	Highly Preferred
3. Understand how the science used in real world	4.00	Highly Preferred
4. Think in a sequential and procedural manner.	4.00	Highly Preferred
5. Be able to provide reasons to support their conclusions.	4.00	Highly Preferred
Totality	**4.00**	**Highly Preferred**

Source: Authors.

unethical practices.

RQ4. Is there a relationship between the preferred profile of recognized cadets and the academic factors that affect their deployment?

The correlational analysis found a strong positive relationship between the preferred age of maritime cadets and their knowledge of English, with a significant p-value of 0.001. This indicates that a higher preferred age is associated with a higher preference for English proficiency.

However, the analysis showed no significant correlation between cadet class or school attended and knowledge of English, with p-values of 0.74 and 0.621, respectively. This suggests that cadet class and the school attended do not influence the preferred level of English knowledge. Additionally, other basic factors such as Math, Science, and core competencies outlined in the STCW Code do not significantly impact the preferred profiles of shipping companies, as there was no variance in the respondents' answers.

6. Discussion.

The results of the study reveal that shipping companies place significant emphasis on specific knowledge areas for maritime cadets, reflecting their priorities for effective shipboard operations.

Firstly, English is highlighted as a critical competency. With the maritime industry being inherently international, the ability to communicate effectively in English is essential for safety, security, and operational efficiency. This aligns with the study of (Ahmmed et al., 2020; Quiao et al., 2021) who emphasize the importance of English proficiency for maritime professionals. The strong preference for cadets with high English proficiency underscores its role as a foundational tool for seamless communication among a diverse crew, which is crucial for managing safety and navigating complex maritime environments.

Mathematics and science also rank highly among the preferred knowledge areas. Mathematics, with a weighted mean of 4.00, is valued for its application in ship stability, navigation, and other critical calculations necessary for maritime oper-

Table 3: Core Competencies in STCW Code 78 as amended (Table A-II/1).

Navigation at Operational Level	**Mean**	**Interpretation**
1.Use of information from navigation equipment to maintain a safe navigational watch	3.90	Highly Preferred
2.Knowledge of blind pilotage techniques	4.00	Highly Preferred
3. application of the International Regulations for Preventing Collisions at Sea, 1972, as amended Reporting in accordance with Ship Reporting Systems and VTS procedures	4.00	Highly Preferred
4.Bridge resource management	3.90	Highly Preferred
5.Use of Electronic Chart Information System	4.00	Highly Preferred
Totality	**3.96**	**Highly Preferred**
Cargo Handling and Stowage at the Operational Level	**Mean**	**Interpretation**
1.Knowledge of safe handling, stowage and securing of cargoes, including dangerous, hazardous and harmful cargoes, and their effect on the safety of life and of the ship	4.00	Highly Preferred
2.Proper procedures for anchoring and mooring	4.00	Highly Preferred
3.Working knowledge and application of stability, trim and stress tables, diagrams and stress calculating equipment	4.00	Highly Preferred
Use of the International Maritime Dangerous Goods (IMDG) Code	4.00	Highly Preferred
4.Monitor the loading, stowage, securing and unloading of cargoes and their care during the voyage	4.00	Highly Preferred
5. General knowledge of the principal structural members of a ship and the proper names for the various parts	4.00	Highly Preferred
Totality	**4.00**	**Highly Preferred**
Controlling Operation of the Ship and Care for Persons on board at the Operational Level	**Mean**	**Interpretation**
1. Prevention of pollution of the marine environment and anti-pollution procedures	4.00	Highly Preferred
2. Knowledge of the precautions to be taken to prevent pollution of the marine environment	4.00	Highly Preferred
3. Understanding of action to be taken in the event of fire, including fires involving oil systems	4.00	Highly Preferred
4. Ability to organize abandon ship drills and knowledge of the operation of survival craft and rescue boats, their launching appliances and arrangements, and their equipment, including radio life-saving appliances, satellite EPIRBs, SARTs, immersion suits and thermal protective aids	4.00	Highly Preferred
5. Practical application of medical guides and advice by radio, including the ability to take effective action based on such knowledge in the case of accidents or illnesses that are likely to occur on board ship	4.00	Highly Preferred
Totality	**4.00**	**Highly Preferred**

Source: Authors.

Table 4: Core Competencies in STCW as amended (Table A-III/1).

Marine Engineering at the Operational Level	Mean	Interpretation
1. Safety and emergency procedures; change-over of remote/automatic to local control of all systems	4.00	Highly Preferred
2. Safety precautions to be observed during a watch and immediate actions to be taken in the event of fire or accident, with particular reference to oil systems	4.00	Highly Preferred
3. Knowledge of engine-room resource management principles including allocation, assignment, and prioritization of resources, effective communication	4.00	Highly Preferred
4. Adequate knowledge of the English language to enable the officer to use engineering publications and to perform engineering duties	4.00	Highly Preferred
5. Operation of all internal communication systems on board	4.00	Highly Preferred
Totality	**4.00**	**Highly Preferred**
Electrical, electronic and control engineering at the operational level		
1. Basic configuration and operation principles of the following electrical, electronic and control equipment	4.00	Highly Preferred
2.Safety requirements for working on shipboard electrical systems, including the safe isolation of electrical equipment required before personnel are permitted to work on such equipment	3.91	Highly Preferred
3. Maintenance and repair of electrical system equipment, switchboards, electric motors, generator and DC electrical systems and equipment	4.00	Highly Preferred
4. Detection of electric malfunction, location of faults and measures to prevent damage	4.00	Highly Preferred
5. Construction and operation of electrical testing and measuring equipment	4.00	Highly Preferred
Totality	**3.98**	**Highly Preferred**
Maintenance and repair at the operational level		
1. Characteristics and limitations of materials used in construction and repair of ships and equipment	4.00	Highly Preferred
2. Characteristics and limitations of processes used for fabrication and repair	4.00	Highly Preferred
3. Safety measures to be taken for repair and maintenance, including the safe isolation of shipboard machinery and equipment required before personnel are permitted to work on such machinery or equipment	3.91	Highly Preferred
4. Maintenance and repair, such as dismantling, adjustment and reassembling of machinery and equipment	4.00	Highly Preferred
5.knowledge in the use of appropriate specialized tools and measuring instrument, Design characteristics and selection of materials in construction of equipment	4.00	Highly Preferred
Totality	**3.98**	**Highly Preferred**
Controlling the operation of the ship and care for persons on board at the operational level		
1. Knowledge of the precautions to be taken to prevent pollution of the marine environment	3.91	Highly Preferred
2. Working knowledge and application of stability, trim and stress tables, diagrams and stress calculating equipment	4.00	Highly Preferred
3. General knowledge of the principal structural members of a ship and the proper names for the various parts	4.00	Highly Preferred
4. Ability to organize abandon ship drills and knowledge of the operation of survival craft and rescue boats, their launching appliances and arrangements, and their equipment, including radio life-saving appliances, satellite EPIRBs, SARTs, immersion suits and thermal protective aids	4.00	Highly Preferred
5. Practical application of medical guides and advice by radio, including the ability to take effective action based on such knowledge in the case of accidents or illnesses that are likely to occur on board ship	4.00	Highly Preferred
Totality	**3.98**	**Highly Preferred**

Source: Authors.

Table 5: Challenges Encounter Upon the selection of cadets for shipboard Training Deployment.

Problems	Frequency	Rank
1. Medical Problems	16	5
2. No Financial Assistance from the parents to process the Documents	12	6
3. Does not follow the Company Policy	18	2
4. Back Out in the middle of Utility	19	1
5. Married after recognition	6	7
6. Does not have enough knowledge	3	10
7. Failed the Interview	4	8
8. Failed the Examination	4	8
9. Hard headed cadet	18	2
10. Cadet always fighting	18	2

Source: Authors.

Table 6: Significant Relationship Profile and Factors.

VARIABLES			n	Chi-square Value	Effect Size	p-value	Remarks
Age	vs	English	20	11.0	1.0	0.001	Significant
Cadet Type	vs	English	20	0.11	0.1	0.74	Not significant
School Type	vs	English	20	0.244	0.149	0.621	Not Significant

Source: Authors.

ations. The importance of mathematics is well-documented by (Voloshynov et al., 2021;Simmons & McLean,2020)who note its role in solving complex maritime problems. Science, with a weighted mean of 3.98, supports technological advancements and safety in the maritime industry. The integration of science into maritime training is essential for understanding and managing the technological and environmental aspects of maritime operations(Purba & Simanjuntak,2024; Simanjuntak & Barus,2024).

Navigation at the Operational Level is another key area of preference, with a weighted mean of 3.96. This reflects the necessity for cadets to be proficient in using navigational equipment and understanding collision regulations (COLREG). Effective navigation is vital for the safe and efficient operation of vessels. The high preference for cargo handling knowledge, also with a weighted mean of 4.00, highlights the importance of understanding cargo operations to prevent accidents and ensure safe handling practices.

Additionally, the preference for knowledge in Marine Engineering, including electrical competencies and maintenance and repair, with weighted means of 4.00 and 3.98 respectively, indicates a strong focus on ensuring that cadets are equipped with the skills needed to maintain and repair shipboard systems. This is critical for the operational efficiency and safety of maritime vessels, as detailed by Sevilla & Arceño (2017) and Demirel (2020).

Based on the findings of this study, it is recommended that maritime educational institutions and training programs focus on enhancing the core competencies identified as crucial by shipping companies. Emphasis should be placed on developing strong English language skills among cadets, as this is essential for effective communication in the international maritime environment. Educational programs should integrate rigorous English training to ensure that cadets can meet the industry's language requirements for safety and operational efficiency.

Additionally, maritime training should prioritize mathematics and science education, given their critical role in maritime operations. Mathematics training should cover ship stability, navigation, and other essential calculations, while science education should include topics relevant to marine technology and environmental management. This will better prepare cadets for the technical challenges they will face on board.

Conclusions and Recommendations.

Conclusions.

This study highlights the critical factors that influence the selection and deployment of maritime cadets for shipboard training, providing valuable insights into the preferences and challenges faced by shipping companies. The findings underscore the significance of specific cadet profiles –particularly those aged 20-21, male, single, and recognized by private institutions– along with strong foundational knowledge in English, Mathematics, and Science, as well as the core competencies set forth in the STCW Code. These preferences reflect the industry's emphasis on academic preparedness and operational competence as prerequisites for successful shipboard training deployment.

Moreover, the study revealed a significant correlation between cadets' age and English proficiency, emphasizing the importance of language skills in navigating the complexities of maritime operations. A notable challenge encountered by shipping companies was cadets withdrawing mid-deployment, indicating a need for enhanced commitment and adherence to training policies.

This research brings closure to the issue of identifying key criteria for cadet selection by providing concrete data on the academic and personal attributes that shipping companies prioritize. However, there remain gaps in knowledge that warrant further investigation. Future studies could explore the root causes of cadet attrition during deployment and develop strategies to mitigate this issue. Additionally, examining the impact of gender diversity and cadet class attendance in more detail could offer new perspectives on fostering inclusivity and consistency in training.

Recommendation.

Based on the findings of this study, it is recommended that maritime training institutions and shipping companies collaborate more closely to align cadet training programs with the industry's specific requirements. Institutions should emphasize the development of strong foundational knowledge in key subjects such as English, Mathematics, and Science, while also ensuring that cadets are well-versed in the core competencies outlined in the STCW Code. Additionally, the targeted efforts should be made to enhance cadets' English proficiency, given its critical role in maritime operations. Shipping companies, on the other hand should consider implementing support mechanisms to reduce mid-deployment cadet withdrawals, such as mentorship programs and better preparatory orientation sessions. To address the challenges identified, it is also recommended that policies ensuring cadet commitment to completing shipboard training be enforced. Further research on the underlying factors contributing to cadet attrition during deployment would help both institutions and companies to devise better retention strategies. By addressing these recommendations, the maritime industry can improve the selection process and ensure the successful deployment of qualified cadets.

Statement of Competing Interest.

The author declares that there are no competing interests regarding the publication of this paper.

List of Abbreviation.

STO – Shipboard training Office

STCW- Standards of Training Certification and Watch keeping

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