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Abstract
This study explored the effectiveness of shipboard familiarization in developing engine watchkeeping skills among marine engineering students at Misamis University in Ozamiz City. Recognizing the essential role of hands-on training in maritime education, the research aimed to evaluate how experiential learning through shipboard exposure enhances the theoretical and practical competencies of future marine engineers. By employing a descriptive-comparative research design, the study examined students' cognitive and technical preparedness before and after undergoing shipboard training. Central to the investigation is the alignment of educational objectives with industry-required competencies, particularly in watchkeeping duties, safety procedures, and situational awareness in engine room operations. The research also underscores the significance of integrating real-world applications into maritime curricula to better equip cadets for the demands of their professional role's onboard vessels.
Keywords: Hands-on Training, Onboard, Safety

Introduction

Amongst the most critical stages in education. Evaluation of the applicability of the programs aimed at satisfying the needs, interests, and issues related to the community. It is also at this stage of the process that educators, administrators, the community, and parents themselves most often request information on the responsiveness of the schools in terms of whether their objectives and goals have been met, as well as the urgent needs and issues pertaining to their communities. The Philippines is one of the maritime nations which have produced seafarers. It is within institutions that considerable effort is invested in responding to the challenge of revising their educational programs due to the rapid technological changes in this automated era, with complex high-technology equipment on board vessels in operational status. This is done so that Filipino seafarers will remain competitive in the global market. (Gilbert Sevilla, Rose Arceño 2017).

The objectives of this study are to focus on both improving the training experience and ensuring that marine engineering students gain the necessary skills for their future careers. Evaluate whether the skills and knowledge acquired during shipboard training match the competencies needed in the marine engineering industry. Measure the degree to which students are gaining hands-on, practical experience in real-life ship operations and examine how effectively shipboard training bridges the gap between classroom-based theoretical learning and its application in real-world marine engineering tasks. Summarily, shipboard training is crucial for achieving educational objectives in marine engineering, as it fosters technical, managerial, and environmental awareness necessary for operating ships safely and efficiently.

Training onboard the ship is structured and systematic. The training system was developed to help a candidate improve their standards to meet the accepted level of competence as outlined in the STCW Code of Competencies (STCW, 2017). This is to keep pace with the vast technology. The maritime sector's demand requires a higher level of expertise, proficiency, and experience at sea to ensure safe and economical means of transportation. In addition, its conventions on international standards for the training, certification, and watchkeeping of seafarers require them to undergo seafaring training to be qualified as sailors. (Ronald et al., 2023)

Helping the aspiring sailor make a career decision is an imperative task during their life preparation period. This calls for an assurance that goals result in their seeing and taking a realistic view of life on board a ship, including the relationships between people, their job, and the problems, rather than dragging them away from the ultimate ideal. (De la Calzada et al. 2000)

The maritime industry should nurture young cadets through a future maritime officers' program and training. Maritime higher institutions and other maritime stakeholders should ensure that cadets are fully briefed and mentored about their jobs on board. Cadets are there to learn and should be trained accordingly; their performance should be assessed to determine areas for improvement and enhance their competencies. (Gilbert & Rose, 2017)

Onboard training has long been an integral part of the program for maritime education. It prepares cadets for "knowing" and "doing" the tasks, responsibilities, and customs on board a vessel. Their one-year apprenticeship A criteria set forth by the Commission on Higher Education (CHED) in conformity with and in support of MARINA, the Maritime Industry Authority, Act of the Republic 10635. This law established MARINA. Is the sole maritime authority in charge of the Application and observance of STCW '78 as changed into law by President Aquino, Benigno S. III on March 13, 2014.

The availability of competent seafarers is an essential element of modern shipping. This issue has come into the spotlight in all countries due to the current imbalance between supply and demand. The fleet is growing, which leads to a recruitment problem. Each country's maritime players should be concerned with the solution of the problem that includes only competent sailors. In this respect, the close relationship that exists among the maritime education and training system must be highly considered. Being a dynamic subject, MET (Maritime Education Training) requires a continuous process of review and updating

supported by innovation and technology transfer. They argue that the MET organizations need to update their management and organizational structures to meet the demands imposed by the modern maritime industry. Although the concept of using Virtual Reality, Head-mounted displays for mixed reality, and augmented reality display technology for specialized training and exercises is not new, their recent developments and availability today make practical use feasible and implementable. Applying these innovations to instruction, practice, and management in the field of maritime affairs opens up new opportunities and paradigms that may support both sea and land activities (Mallam et al., 2019).

One of the issues we may face in this research is a mismatch between the needs of training and industry. Shipboard training may not keep pace with the technology assimilated over time or the real-world requirements of the industry. This results in a lack of vital skills and knowledge about practicability for marine engineering graduates. Also, inappropriate exposure during practice. In some training programs, there is a lack of hands-on experience or exposure to operational real-life challenges. Insufficient time aboard, which students are intended to spend there, could fail trying to merge theory and practice in the minds of students.

Objectives of the Study

This study aimed to determine the effectiveness of shipboard training for the maritime engineering students of Misamis University. This study attained the basic knowledge of engine watchkeeping and skill development. Furthermore, this study specifically aims to:

1. to create a profile of the respondents of the study and
2. to assess the effectiveness of shipboard familiarization in enhancing engine watchkeeping skills.

Significance of the Study

The significance of this study is to help upcoming students who want to know what they can learn or improve during shipboard training. To be a part of the maritime industry, it is a must to go on shipboard training to improve your skills and thinking. It also lies in its contribution to both the academic and practical development of marine engineers, the improvement of maritime safety, and the enhancement of global maritime operations. Shipboard training allows marine engineering students to apply the theoretical knowledge acquired in classrooms to real-world ship operations.

Research Methodology

Research Design

This study utilized a descriptive-comparative research design to assess the effectiveness of shipboard familiarization in enhancing the engine watchkeeping skills of Marine Engineering students. A researcher-made quiz focusing on engine watchkeeping duties, responsibilities, safety procedures, and basic knowledge was administered before and after the shipboard familiarization. The pre-test was conducted prior to the students' sea trip to measure their baseline knowledge. At the same time, the post-test was administered afterward to evaluate any improvement in their theoretical and cognitive skills. By comparing the results, the study aimed to determine whether shipboard familiarization had a significant impact on the students' learning outcomes.

Research Setting

The research setting for this study is the Misamis University-Ozamiz City campus, the sole institution in Misamis Occidental recognized and accredited by CHED-MARINA to offer maritime transportation and Marine Engineering programs. This recognition highlights the university's adherence to maritime education standards, providing a relevant and credible environment for study. The campus provides access to marine engineering students actively engaged in shipboard familiarization, making it an ideal location for data collection. Its status as a leading maritime education provider in the region further validates its suitability for this research.

Sampling Procedure

The sampling procedure for this study focused exclusively on maritime education students majoring in Marine Engineering at Misamis University. Out of 51 students required to participate in the shipboard training for the school year, a sample size of 46 respondents was determined using the Raosoft calculator at a 95% confidence level and a 5% margin of error. These students participated in a pre-test activity conducted on November 13-14, before their shipboard training, and completed a post-test on November 26, after the training, using the same set of questions to assess the effectiveness of the shipboard training on engine watchkeeping skills. Both tests were administered in a controlled pen-and-paper setting to ensure consistency and reliability of the results.

Data Gathering Instruments

In this study, the researchers developed a 15-item multiple-choice quiz designed to assess the theoretical knowledge of marine engineering students related to engine watchkeeping skills. The quiz focused on key areas, including safety protocols, duties, basic technical knowledge, and procedures to follow before and after assuming watchkeeping duties on board. By covering both the theoretical aspects of engine room operations and the practical considerations involved in watchkeeping, the instrument ensured that all critical areas of training were evaluated.

Validity and Reliability of the Instrument

The validity and reliability of the instrument were rigorously assessed to ensure its accuracy and consistency. The researchers developed a questionnaire comprising respondent profile questions and a 15-item quiz, identical for both pre-test and post-test evaluations. To establish content validity, maritime education experts from Misamis University reviewed and refined the quiz, ensuring it aligned with industry standards and learning objectives. A pilot test involving 20 respondents was then conducted, and the reliability of the instrument was analyzed using Cronbach's alpha, yielding a score of 0.71. The data analysis was conducted using SPSS (Statistical Package for the Social Sciences). This result confirms the questionnaire's reliability, indicating that the quiz effectively measures engine watchkeeping knowledge with consistency and validity across repeated applications.

Mode of Analysis

In this study, descriptive statistics were used to analyze the demographic profile of the respondents, presenting the distribution of key variables, including age, gender, and year level, through percentage data. The use of a *t-test* allowed the researchers to assess the effectiveness of Shipboard Familiarization on Engine Watchkeeping Skills by comparing the

mean scores from the pre-test and post-test. This statistical approach helped determine whether the observed changes in scores were significant, indicating whether the shipboard training contributed to improved knowledge. By examining the mean differences and calculating the *p*-value, the study confirmed whether the training had a measurable impact on the students' theoretical and cognitive development in engine watchkeeping.

Ethical Consideration

Ethical considerations were carefully observed in this study to ensure the integrity and rights of the participants. Approval was first sought from the Dean of the College of Maritime Education to conduct the study among the maritime students. After validating and confirming the reliability of the questionnaire, the researchers distributed informed consent forms and researcher a quiz to the respondents, clearly outlining the purpose of the study, their voluntary participation, and the confidentiality of their responses. This process ensured that participants fully understood their role in the study and agreed to participate voluntarily, thereby maintaining adherence to ethical research standards.

Results and Discussion

Profile of the Respondents

The study on the Effectiveness of Shipboard Familiarization on Engine Watchkeeping Skills among Marine Engineering Students involved a total of 44 respondents, predominantly male (45), with only one female participant. Most respondents (42) were aged between 18-20 years, while a minority (4) fell within the 21-23 age range. The majority of the respondents (39) were in their third year of study, with only 6 participants from the second year. This demographic profile highlights the concentration of younger, third-year male students, reflecting the typical composition of marine engineering cohorts in the institution.

Maritime education is predominantly male-dominated, primarily due to cultural norms that associate seafaring with masculinity, while societal expectations and limited family support discourage women from entering the field (Hanzu-Pazara et al., 2021). The typical age range of students, 18-20 years, corresponds with the standard educational progression from secondary school to specialized programs. In the Philippines, the age range of 21-23 years for maritime students reflects the structured nature of their education, which includes academic coursework and mandatory shipboard training (Manila Times, 2021). This training phase extends the timeline, so students often graduate later and enter the workforce at an older age (Maritime Fair Trade, 2024). These factors contribute to the demographic profile seen in maritime institutions globally.

Table 1
Profile of Maritime Students by Gender, Age, and Year Level

GENDER		**AGE**		**Year Level**	
Male	45	18-20	42	First Year	0
Female	1	21-23	4	Second Year	6
		24 years or older	0	Third Year	40
TOTAL	**46**	**TOTAL**	**46**	**TOTAL**	**46**

Assessment of Shipboard Familiarization and Engine Watchkeeping Skills

Average of the Pre-test and Post-test Score

The table displays the pre-test and post-test scores for 15 engine watchkeeping scenario questions, which measure the respondents' understanding before and after training. It highlights the progression of knowledge, with each question having a specific initial score (pre-test) and an improved score after training (post-test). The data illustrates which topics were well-understood and which needed more focus, as seen from variations in scores. The highest improvements indicate effective learning areas, while lower gains point to topics requiring further reinforcement.

In the pre-test, the highest average score was 0.41, observed in questions 5 and 8, while the lowest score was 0.02 in question 14. For the post-test, the highest average score was 1.00 for question 1, and the lowest was 0.30 for question 14. Question 1 showed the highest increase, improving from 0.20 to 1.00, indicating a significant gain in understanding. Meanwhile, question 6 had the lowest improvement, rising from 0.22 to 0.39, suggesting a need for further emphasis on this topic during training.

Table 2

Comparison of Pre-test and Post-test Scores on Engine Watchkeeping Scenarios

Questions	Pre-test Score	Post-Score	Mean Difference
1. What are the primary responsibilities of a watch-keeper in the engine room?	20%/80%	100%/0%	80%
2. What personal protective equipment (PPE) is essential in an engine room?	13%/87%	80%/20%	67%
3. What is the primary purpose of shipboard familiarization?	4%/96%	67%/33	63%
4. Which of the following PPE (Personal Protective Equipment) is most essential in the engine room?	9%/91%	50%/50%	41%
5. Why is it essential to maintain a clean and organized engine room?	41%/59%	76%/24%	35%
6. What should you do before assuming your watchkeeping duties?	22%/78%	39%/61%	17%
7. What is the final duty before leaving your post after your watch?	39%/61%	72%/28%	33%
8. What does an oil mist detector monitor?	41%/59%	72%/28%	31%
9. What safety checks should be conducted before entering the engine room?	11%/89%	41%/59%	30%
10. Why is the oil mist detector important for safety?	35%/65%	86%/16%	51%
11. What should you do first when entering the engine room?	7%/93%	35%/65%	28%
12. What is the primary reason for wearing PPE in the engine room?	34%/66	65%/35%	31%

13. Which PPE is essential for handling chemicals in the engine room?	7%/93	46%/54	39%
14. What does pipe colour coding help within the engine room?	2%/98%	33%/67	31%
15. Why is fuel monitoring important?	33%/67%	57%/43	24%
Average	**21%/79%**	**61%/39%**	**40%**

The significant increase in average scores from 0.20 in the pre-test to 1.00 in the post-test, with a mean difference of 0.80, indicates a substantial improvement in the student's understanding of the responsibilities of a watchkeeper in the engine room. This result highlights the effectiveness of shipboard training in enhancing practical knowledge and situational awareness among third-year maritime students. The improved scores suggest that hands-on experience reinforces theoretical learning, bridging the gap between classroom instruction and real-world application. The students' improved understanding implies they are better prepared to handle essential watchkeeping responsibilities, contributing to safer and more efficient engine room operations. This also highlights the importance of integrating practical experiences into the curriculum to ensure competency in essential maritime tasks.

On the other hand, questions with low mean differences, such as question 6, highlight areas where comprehension remains limited despite training, indicating the need for more focused or alternative instructional strategies. It suggests a gap in their understanding of diagnosing mechanical issues or recognizing abnormal engine conditions. This could indicate that the theoretical instruction or practical training did not sufficiently emphasize these preparatory steps, or that students struggle to connect classroom learning with real-world applications. Such mistakes highlight the need for more targeted education on the importance of pre-watch readiness, including safety checks, communication protocols, and situational awareness. It also highlights a critical area where students might lack confidence or clarity, which could impact their future performance in real watchkeeping scenarios.

T-test result of Pre-test and Post-test score

The results show a significant improvement in engine watchkeeping knowledge, with the mean score increasing from 0.22 in the pre-test to 0.58 in the post-test and a low variance of 0.03, indicating consistent performance among students. The extremely low *p*-value (0.0000000000036) demonstrates that this improvement is statistically significant, confirming the effectiveness of shipboard familiarization training. This suggests that practical exposure substantially enhances students' understanding of crucial concepts, such as safety protocols, personal protective equipment, and watchkeeping responsibilities. The positive outcomes underscore the importance of integrating hands-on training into maritime education to bridge the gap between theory and practice.

Table 3
Statistical Comparison of Pre-test and Post-test Scores on Engine Watchkeeping Knowledge"

	Pre-test	**Post-test**
Mean	0.22	0.58
Variance	0.03	0.03
***p*-value**	0.0000000000036	

Shipboard familiarization on engine watchkeeping skills effectively enhances marine engineering students' theoretical and cognitive capabilities by providing real-world, hands-on experiences that reinforce classroom knowledge. This training bridges the gap between theoretical understanding and practical application, ensuring that students internalize crucial concepts such as equipment handling, safety protocols, and procedural checks. The significant improvement in post-test scores underscores the efficacy of this method in enhancing comprehension and retention. These enhanced competencies prepare future seafarers to meet industry standards, promoting safety and operational efficiency on vessels. Ultimately, robust training translates into more competent and confident professionals capable of managing the complexities of modern maritime environments, contributing to a safer and more accountable industry (Mangga et al., 2023).

Practical training reinforces classroom knowledge, enabling students to apply concepts such as equipment handling, safety protocols, and maintenance procedures directly in real-world settings. This hands-on experience fosters critical thinking and problem-solving abilities essential for managing complex engine room operations (Marine Insight, 2018; Maritime Education, 2019). As future seafarers, this training enhances their professional competency, ensuring they are well-prepared to meet industry standards and handle high-pressure scenarios effectively (International Maritime Organization, 2019). Ultimately, robust familiarization programs contribute to the overall safety and efficiency of maritime operations, promoting career readiness and continuous professional growth (Marine Insight, 2018).

Conclusion and Recommendation

The study concluded that shipboard training significantly improved the scores of maritime students, demonstrating an enhanced understanding of engine watchkeeping skills. This improvement reflects not only a firmer grasp of theoretical knowledge but also a marked development in cognitive abilities related to their duties and responsibilities. The positive results underscore the effectiveness of practical shipboard familiarization in complementing classroom instruction. Overall, the findings confirm that shipboard training is a vital component in enhancing the knowledge and skills of maritime students, preparing them for real-world responsibilities.

It is recommended that shipboard training be further integrated and emphasized in the maritime education curriculum to reinforce both theoretical knowledge and practical skills. Additional training modules and simulations focusing on engine watchkeeping duties and safety protocols could further enhance students' cognitive and technical abilities. Regular assessments, such as pre-tests and post-tests, should be implemented to track progress and identify areas for improvement. This recommendation is vital for the holistic development of maritime students, ensuring they are well-prepared to handle real-world challenges and responsibilities in their future careers.

References

Hanzu-Pazara, R., Arsenie, P., Hanzu-Pazara, L. (2010). Higher performance in maritime education. *Int. J. Mar. Navig. Saf. Sea Transp.* 2010, *4*, 87–93.

Hwang, H., Hwang, T., & Youn, I. (2022). Effect of Onboard Training for Improvement of Navigation Skill under the Simulated Navigation Environment for Maritime Autonomous Surface Ship Operation Training. *Applied Sciences*, *12*(18), 9300. https://doi.org/10.3390/app12189300

International Maritime Organization. (2019). *STCW: A guide for seafarers*. Retrieved from imo.org

Magsino, R., Paraggua, V., Mobo, F., Acuavera, R., Villavicencio, L., Pasa, G., & Guiang, S. L. (2023). Students' Onboard Experiences: Basis for Improved Shipboard Training Program Policy. International Journal of English Literature and Social Sciences. 8. 259-274. 10.22161/ijels.82.38.

Mangga, C., Tibo-oc, P., & Montaño, R. (2023). *Impact of Engine Room Simulator as a Tool for Training and Competency Assessment in Engine Watchkeeping*. Journal of Maritime Education and Research, 19(2), 92-95.

Manila Times. (2021). *Transforming Philippine maritime education*. Retrieved from https://manilatimes.net

Marine Insight. (2018). Procedure for ship familiarization for new crew members on ships. Retrieved from marineinsight.com

Maritime Education. (2019). Ship engineering cadet: Gaining experience in engine room watchkeeping on ships. Retrieved from maritimeducation.com

Maritime Fair Trade. (2024). *Philippines: Overcoming challenges in maritime education*. Retrieved from https://maritimefairtrade.org

Sevilla, G. S., & Arceno, R. A. (2017). Structured shipboard training program and performance of maritime cadets. *International Journal of English Literature and Social Sciences*, *2*(4), 90–110. https://doi.org/10.24001/ijels.2.4.12