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A COMPREHENSIVE NEEDS ANALYSIS OF MARITIME ENGLISH FOR SHIP MACHINERY STUDENTS

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ABSTRACT
Maritime English is essential for ensuring safety, efficiency, and effective communication in the global maritime industry, particularly for ship machinery students who require specialized language skills for technical and emergency situations. This study examines the specific needs of ship machinery students in Maritime English education, highlighting significant gaps in the current curriculum, especially in technical terminology and practical communication exercises for ship machinery operations and emergencies. A mixed-methods approach was utilized, involving 24 students and four professionals through questionnaires, interviews, and document analysis. Results indicate that 75% of students find the curriculum moderately effective, but 65% identify gaps in technical terminology, and 60% report inadequate real-life communication practice. Instructors emphasized the need for professional development to address these gaps. The study calls for a tailored curriculum based on English for Specific Purposes (ESP), integrating specialized content, practical exercises, and realistic simulations. It underscores the importance of continuous needs analyses and institutional support for curriculum enhancements, ensuring that Maritime English instruction remains relevant and effective in preparing students for their professional roles in the maritime industry. This approach will contribute to global maritime safety and efficiency by equipping ship machinery students with the necessary language skills.
Keywords: *Maritime Vocabulary, VLS, Cadet, Sorong*

INTRODUCTION

Maritime English is a specialized communication skill that is critically important in the global maritime industry. It ensures safety, efficiency, and effective collaboration among seafarers from diverse linguistic and cultural backgrounds (Sartini, 2018; Sirbu & Alibec, 2023). As the primary language used in navigation, inter-vessel communication, and port and international shipping operations, proficiency in Maritime English is essential for operational effectiveness (Barus & Simanjuntak, 2023). The global maritime industry relies heavily on English as its lingua franca, emphasizing its significance for safe and efficient ship operations (Simanjuntak et al., 2023). English serves as the international working language in various contexts such as ship-to-ship and ship-to-shore communication and among maritime personnel (Rosiana et al., 2023).

Proficiency in Maritime English is also crucial for the recruitment and performance of ship crew members. Crew members are required to have skills in

Maritime English to meet international standards, with spoken English, or Standard Marine Communication Phrases (SMCP), being accepted for use at sea (Sudewo, 2023). The necessity for Maritime English resources and materials has been emphasized in various conferences and projects related to Maritime Education and Training (MET) (Ismail et al., 2020).

For ship machinery students, the need for proficiency in Maritime English is even more significant. They must understand the technical terminology used in machinery and ship technology, communicate effectively in emergency situations, follow safety instructions, and collaborate with international crews. Maritime English is divided into General Maritime English (GME) and Specialized Maritime English (SME) for Deck Officers, Engineering Officers, and Electro technical Officers (International Maritime Organization, 2015). The International Maritime Organization (IMO) stresses the importance of seafarers' knowledge of maritime terms, highlighting the necessity for students to understand these specialized terminologies (Smirnov et al., 2023). Developing language skills in a maritime context aids in technical knowledge acquisition, broadens professional perspectives, and facilitates effective communication in a multicultural environment (Dirgeyasa, 2018; Đurović & Vukičević, 2022).

This research is driven by the recognition of the critical importance of Maritime English within the maritime industry, particularly for ship machinery students who face unique challenges that differ from those encountered by their nautical counterparts. The current educational resources predominantly offer General Maritime English, which does not cater specifically to the needs of ship machinery students, underscoring the necessity for a thorough needs analysis to develop appropriate materials.

The theoretical framework for this research is based on English for Specific Purposes (ESP), which aims to meet the specific needs of learners by focusing on the contexts or situations they will encounter in their future careers. ESP differs from general English instruction in its tailored approach, specialized content, and practical applications (Hutchinson & Waters, 2010).

Dudley-Evans and St John describe ESP as a distinctive pedagogical approach that emphasizes specific learner needs and recognizes their subject-matter expertise (Hyland, 2000). Furthermore, the disparity in English language proficiency among

instructors highlights the necessity for targeted training programs to meet the specific requirements of English for Academic Purposes (EAP) instructors (Husan & Shakur, 2023).

To conduct effective Maritime Education and Training (MET), institutions must adhere to IMO guidelines. For example, IMO Model Course 7.04 outlines competencies required for officers in charge of engineering watch, including maintaining a safe engineering watch, proficiency in English, and the operation of various machinery and control systems. Additionally, Maritime English courses are based on IMO Model Course 3.17, which is divided into GME and SME (Wahl & Kongsvik, 2018). Achieving the desired training outcomes requires well-designed course outlines and syllabi, necessitating a needs analysis to develop appropriate materials (Wahl & Kongsvik, 2018).

Previous research on Maritime English needs analysis has primarily focused on the nautical or deck department, revealing the "necessities, lacks, and wants" of Maritime English (Aeni et al., 2018). However, there is a notable gap in research specifically addressing the needs of the engineering department or ship machinery students. The differing work environments and language requirements between nautical and engineering officers necessitate a focused needs analysis for ship machinery students. This research aims to conduct a comprehensive needs analysis of Maritime English for ship machinery students, addressing typical language content and components they must master for their future careers as seafarers. This analysis will guide the development of specialized instructional materials that align with their specific professional needs, ultimately enhancing their competence and contributing to the overall safety and efficiency of maritime operations.

METHOD

The research methodology for this study on the needs analysis of Maritime English for ship machinery students integrates both qualitative and quantitative approaches. Participants include 24 ship machinery students from Sorong Merchant Marine Polytechnic, who have undergone two semesters of Maritime English instruction and are preparing for onboard work, and four professionals possessing at least a Class III engineering certificate and over two years of onboard experience. These participants were selected to represent the broader population of ship machinery students and professionals for several reasons. The 24 students come from

various regions of Indonesia, providing a diverse sample that reflects the different backgrounds and experiences of ship machinery students. This diversity in regional representation ensures that the sample encompasses a wide range of cultural and educational backgrounds, making the findings more generalizable. The inclusion of students who have completed two semesters of Maritime English ensures that they have a foundational understanding of the subject, making their feedback on curriculum effectiveness and needs more informed and relevant. The four professionals were chosen based on their extensive experience and certification, which ensure that their insights into the practical applications and gaps in Maritime English education are both credible and comprehensive.

Data will be collected through structured questionnaires distributed in paper form, semi-structured face-to-face interviews, and systematic document analysis of course syllabi, instructional materials, and IMO guidelines. Quantitative data from questionnaires will be analyzed using descriptive statistics, while qualitative data from interviews and document analysis will be examined through thematic analysis. This process involves calculating measures such as frequencies, means, standard deviations, and percentages to provide a clear overview of the responses received (Astrid et al., 2022; Mun et al., 2019; Musa & Yamat, 2021; Qasem et al., 2017; Yusuf et al., 2022).

The questionnaires will focus on several key areas: the effectiveness of the current Maritime English curriculum, gaps in technical terminology, the adequacy of practical communication exercises, and the usefulness of existing materials for specialized contexts. For example, questions may include: "How effective do you find the current Maritime English curriculum in preparing you for technical tasks?" and "What specific technical terms do you find missing or inadequately covered in your current coursework?"

Interviews with instructors and professionals will delve into deeper insights regarding the language needs and challenges faced by ship machinery students. Themes for the interviews will include the balance between general Maritime English instruction and specialized needs, the challenges in delivering practical communication training, and suggestions for curriculum improvements. Sample interview questions might be: "Can you describe specific challenges you face in teaching technical terminology to ship machinery students?" and "What

improvements would you suggest for the Maritime English curriculum to better address emergency communication scenarios?"

The thematic analysis involves pinpointing, examining, and recording themes within the data, which can be derived from various sources such as interviews and documents (Ramli et al., 2023). This method is particularly suitable for analyzing transcribed interview data, as it allows for the identification and analysis of recurring patterns or themes within the data (Lindegaard et al., 2021). To ensure validity and reliability, the study will employ triangulation by comparing findings from different data sources. Triangulation, a methodological approach used in research, involves comparing findings from different data sources to ensure validity and reliability (Creswell & Miller, 2000). By utilizing triangulation, researchers can promote a more comprehensive understanding of the phenomenon under study and enhance the rigor of their research (Heale & Forbes, 2013).

The process will involve cross-verifying quantitative data from questionnaires with qualitative insights from interviews and document analysis. This includes identifying common themes and discrepancies between the data sets. For example, if a significant gap in technical terminology is identified in the questionnaires, this finding will be cross-checked with themes derived from the interviews and document analysis to confirm its validity. By integrating multiple data sources, the study aims to provide a more comprehensive and accurate understanding of the needs of ship machinery students in Maritime English education.

FINDING AND DISCUSSION

The questionnaires revealed that 75% of students felt the current Maritime English curriculum was moderately effective but identified significant gaps in technical terminology and practical communication exercises specific to ship machinery contexts. About 65% of students highlighted insufficient emphasis on technical terms, and 60% pointed out inadequate practice for real-life communication scenarios, particularly emergency situations. Additionally, 70% of students found the existing materials somewhat useful for general Maritime English but inadequate for specialized contexts, expressing a need for more focused resources that address the specific demands of their roles. The primary areas where students felt least prepared were technical writing (55%) and oral communication during operational tasks and emergencies (52%).

Interviews with instructors provided deeper insights into the language needs and challenges faced by ship machinery students. Instructors noted challenges in balancing general Maritime English instruction with the specialized needs of ship machinery students and expressed a desire for more professional development opportunities to better address these specific requirements. The document analysis revealed that current Maritime English materials and syllabi are heavily oriented towards General Maritime English (GME), with limited content specific to ship machinery. The reviewed documents showed broad coverage of general maritime communication skills but lacked depth in specialized topics such as machinery operation, technical troubleshooting, and emergency response communication. While the materials align with the general guidelines of IMO Model Course 3.17, there is a noticeable gap in addressing the specific competencies outlined in IMO MC 7.04 for engineering watch officers.

The findings underscore the need to align Maritime English instruction for ship machinery students with the principles of English for Specific Purposes (ESP). Maritime English, as a specialized field falling under ESP, focuses on providing students with the language skills and terminology necessary for clear communication in maritime contexts (Barus & Simanjuntak, 2023). It has been emphasized that Maritime English is a professional language falling under ESP, emphasizing the importance of aligning language instruction with industry-specific needs (Ahmmed, 2021). The current curriculum, while adequate for general purposes, does not fully address the specialized needs of these students. ESP emphasizes tailoring instruction to the specific contexts and situations that learners will encounter in their professional lives, confirming that a more focused approach is required. ESP focuses on customizing instruction to the particular contexts and situations learners will face in their professional lives, indicating a necessity for a more targeted approach (Ali & Ghafar, 2024; Balaei & Ahour, 2018; Saragih, 2014; Shahid et al., 2023; Yundayani et al., 2019). This approach prioritizes teaching language that is directly relevant to learners' needs and wants, rather than presenting language skills in isolation (Ali & Ghafar, 2024; Azami & Rahmawati, 2023; Shaalan, 2020). Additionally, ESP emphasizes meaningful instruction over grammar-focused teaching, aiming to connect language learning to students' real-life experiences (Azami & Rahmawati, 2023).

Technical writing is a critical skill in the maritime industry, requiring precision and clarity to ensure accurate documentation of machinery operations and maintenance procedures. The difficulty in mastering technical writing can be attributed to the complexity of the technical terminology and the need for exact language use, which many students may not be sufficiently exposed to in their current curriculum. This lack of preparation can lead to errors in documentation, potentially compromising the safety and efficiency of maritime operations. Emergency communication is another area of concern. The high-pressure nature of emergency situations demands clear, concise, and rapid communication to ensure effective response and coordination among crew members. Students' struggles in this area may stem from insufficient practical training and simulations that mimic real-life scenarios. The inability to communicate effectively during emergencies can have severe consequences, including delayed response times and miscommunication, which can exacerbate the situation and increase the risk of accidents.

The gaps identified in technical terminology and practical communication exercises reflect the broader ESP literature, which emphasizes the need for specialized content tailored to specific professional contexts**.** Studies by Hutchinson & Waters and Dudley-Evans & St John argue that ESP courses must address the precise language and communication needs of learners in their specific fields (Dudley-Evans & John, 1998; Hutchinson & Waters, 2010). The current study supports this view by demonstrating that ship machinery students require more focused instruction that directly pertains to their technical and operational tasks.

The results highlight the critical importance of developing specialized materials for ship machinery students. Such materials should include technical terminology, practical communication exercises, and realistic simulations that reflect the specific challenges and scenarios these students will face in their careers. Insights from both students and professionals stress the need for these targeted resources. Integrating mnemonic strategies for learning technical terminology, as discussed in the study by Brahler & Walker, can assist students in memorizing essential vocabulary critical for their comprehension of ship machinery operations (Brahler & Walker, 2008). This foundational knowledge is vital for students to develop the critical thinking and problem-solving skills required for their careers.

Enhancing practical communication skills, particularly in technical writing and oral communication during operational and emergency situations, is essential. Maritime English is pivotal in enabling effective communication in an industry where safety, efficiency, and environmental responsibility are paramount (Barus & Simanjuntak, 2023). The teaching content of Maritime English adheres to international standards like the International Convention on Standards of Training, Certification, and Watch keeping, stressing the necessity of a high proficiency level in Maritime English for masters, officers, and officers of the watch on merchant ships (Jurkovič, 2015). Furthermore, the proficiency in Maritime English is crucial for ensuring the safety of ship operations (Sari & Sari, 2022).

Research indicates that Maritime English is a specialized form of language instruction that acts as a common working language in the maritime sector, emphasizing the importance of English for the safety of ships, crews, and the marine environment (Hafita et al., 2024). Additionally, the requirement for Maritime English resources and materials has been acknowledged in various projects and conferences on Maritime Education and Training (MET) (Ismail et al., 2020). The global maritime industry depends on English as its primary language, highlighting the critical significance of effective English communication for secure and efficient ship operations (Simanjuntak et al., 2023).

To cater to the needs of ship machinery students, it is vital to consider their perspectives on Maritime English learning materials. Conducting a comprehensive needs analysis can aid in redesigning English learning materials to precisely meet the demands of seafarers in the international maritime workplace (Khosiyono et al., 2019). Moreover, exploring the challenges faced by instructors in delivering Maritime English education online to students with varying English proficiency levels can offer insights into effective strategies for enhancing language instruction in maritime education (Sari & Sari, 2022). Incorporating more hands-on activities, such as role-playing and simulations, can help students develop these crucial skills, improving language proficiency and preparing them for real-world situations where effective communication is vital for safety and efficiency. Research supports the effectiveness of experiential learning methods in language education, particularly in specialized fields like Maritime English (Barus & Simanjuntak, 2023). Role-playing activities provide students with opportunities to practice communication in context-specific

situations, improving their ability to convey technical information accurately and effectively (Jurkovič, 2015).

Similarly, simulations allow students to engage in realistic scenarios, such as emergency situations onboard a ship, where they must communicate clearly and decisively to ensure the safety of the crew and the vessel (Sari & Sari, 2022). Moreover, incorporating hands-on activities in language learning has been shown to increase student engagement and motivation, leading to improved language acquisition and retention (Hafita et al., 2024). By immersing students in interactive learning experiences that mirror real-world challenges they may encounter in their maritime careers, educators can better prepare them for the demands of the industry (Ismail et al., 2020). Role-playing and simulations also foster critical thinking, problem-solving, and teamwork skills, which are essential for effective communication in high-stakes maritime environments (Simanjuntak et al., 2023).

Instructors play a pivotal role in delivering effective Maritime English instruction. The study reveals a need for ongoing professional development to equip instructors with the skills and knowledge to address the specific needs of ship machinery students. Instructors are crucial in delivering effective Maritime English instruction to ship machinery students, as emphasized in a study highlighting the importance of ongoing professional development to equip instructors with the necessary skills and knowledge to address students' specific needs in this field (Vujičić et al., 2022). The competence of Maritime Education and Training (MET) instructors is vital for ensuring maritime safety and preparing students for industry challenges (Barus & Simanjuntak, 2023). Studies focusing on the qualities of ideal Maritime English teachers underscore the significance of educators who are passionate about building effective communication, motivating students, and fostering positive relationships (Anggraini et al., 2020).

The concept of "marinisation" of Maritime English instructors is recognized as a key component of MET, emphasizing the necessity for instructors to have a profound understanding of the maritime industry to effectively impart knowledge to students. Multidisciplinary teaching approaches in MET institutions support the development of instructors to enhance their teaching capabilities and promote effective knowledge transfer (CHIREA-UNGUREANU, 2021). Additionally, integrating risk assessment provisions into Maritime English courses can enhance

students' ability to apply risk assessment techniques, contributing to improved safety practices in the maritime sector (SMELIKOVA, 2023). Professional development for maritime instructors is essential for enhancing their competence, retention, and performance, ultimately contributing to the improvement of the educational environment and organizational effectiveness (Atienza, 2023). By addressing the challenges faced by instructors and embracing opportunities for improvement, maritime education can better prepare cadets to navigate the complexities of the global maritime industry (Simanjuntak et al., 2023). The intersection of psychological features and language proficiency in seamen's activities underscores the practical implications of language skills in emergency management within the maritime context (Simanjuntak, 2024).

This can include training on the latest industry terminology, teaching methodologies for ESP, and the use of simulation tools to enhance practical training. Professional development for instructors to equip them with the necessary skills and knowledge to address students' specific needs is crucial (Mallam et al., 2019; Ratnaningsih et al., 2024; Sardar et al., 2022; Zhu et al., 2019).

Training on industry-specific terminology is vital for students to effectively communicate in the maritime sector. Teaching methodologies for ESP focus on providing students with the language skills required for their specific field, such as technical writing and oral communication in operational and emergency situations (Dewan et al., 2023; Markopoulos et al., 2022). Utilizing simulation tools can offer hands-on experience in realistic scenarios, enhancing students' practical communication skills and readiness for real-world challenges (Boulougouris et al., 2019).

To address the identified gaps in the current curriculum, it is essential to conduct regular needs analyses to update and refine instructional materials and teaching strategies. Needs analysis is a fundamental step in designing and developing language courses, creating teaching materials, and developing language tests (Rahman, 2015; Saragih, 2014). By conducting thorough needs analyses, educators can gain insights into the specific language needs of ship machinery students, enabling them to tailor instructional materials and teaching strategies to effectively address these requirements (Enesi et al., 2021; Saragih, 2014). Integrating the latest industry terminology and teaching methodologies for English for Specific Purposes (ESP)

based on the outcomes of needs analyses can enhance the relevance and effectiveness of the curriculum (Jurkovič, 2015; Pašalić & Plančić, 2018). Understanding the language needs of ship machinery students through needs analyses allows for the development of targeted instructional materials that focus on practical communication skills required in operational and emergency situations (Enesi et al., 2021; Saragih, 2014). Moreover, incorporating simulation tools and immersive technologies into the curriculum can provide students with hands-on experience in realistic maritime scenarios, further enhancing their practical training and language proficiency (Dewan et al., 2023; Mallam et al., 2019).

This ensures that the curriculum remains relevant and effective in meeting the evolving needs of ship machinery students and the maritime industry. The dynamic nature of the maritime industry necessitates that Maritime English education continuously adapts to new challenges and technological advancements (Simanjuntak et al., 2023). By keeping the curriculum aligned with industry developments and incorporating feedback from both students and instructors, educational institutions can better prepare students for successful careers in maritime professions (Pašalić & Plančić, 2018).

In conclusion, the results of this study highlight several critical areas for improvement in the Maritime English curriculum for ship machinery students. The identified gaps in technical terminology, practical communication exercises, and specialized materials underscore the need for a more targeted and context-specific approach to language instruction. Incorporating insights from needs analyses, enhancing professional development for instructors, and integrating experiential learning methods such as role-playing and simulations are essential steps towards addressing these gaps. By doing so, maritime education can better equip ship machinery students with the language skills necessary for their professional roles, ultimately contributing to safer and more efficient maritime operations. Future research should continue to explore effective strategies for Maritime English instruction, ensuring that it remains responsive to the needs of the maritime industry and its workforce.

CONCLUSION

This study underscores the critical need for a specialized approach to Maritime English education for ship machinery students, revealing significant gaps in the current

curriculum, particularly in technical terminology and practical communication exercises pertinent to ship machinery operations and emergency scenarios. The findings emphasize the urgency for curriculum enhancements to include specialized content, practical communication exercises, and realistic simulations. Additionally, the study highlights the importance of ongoing professional development for instructors, focusing on industry-specific terminology and advanced ESP teaching methodologies. Investing in enhanced teaching materials aligned with IMO MC 7.04 competencies and incorporating experiential learning methods like role-playing and simulations can significantly improve students' practical communication skills. Regular needs analyses are essential to ensure the curriculum remains relevant and responsive to the evolving maritime industry. Institutional and policy support is vital for funding curriculum development, professional training, and the acquisition of advanced teaching tools. Addressing these implications will enhance the effectiveness of Maritime English programs, better preparing ship machinery students for their professional roles, and ultimately contributing to global maritime safety and efficiency.

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