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Perspectives on Knowledge Representation in Maritime Education: A Qualitative Exploration of STIP Jakarta Cadets

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Abstract. *This research investigates the perspectives of 240 Maritime Institute Jakarta (STIP Jakarta) cadets regarding knowledge representation in navigational decision support systems. Grounded in a qualitative descriptive approach, the study unfolds over three semesters, examining academic self-checked intelligence, professional competences, motivations, and the cadets' viewpoints on the complexities of maritime education. The cadets, enrolled in an international programme, undergo extensive preparation for internships within the global shipping industry, necessitating proficiency in English communication aligned with International Maritime Organization standards. The findings reveal a positive correlation between academic self-checked intelligence and professional competences, underscoring the significance of metacognitive strategies in shaping technical proficiency. Motivations, both intrinsic and extrinsic, emerge as crucial influencers shaping cadets' perspectives on knowledge representation. The study also highlights the evolving confidence of cadets in English maritime literacy, emphasising the necessity of tailored language instruction strategies. Recommendations for enhancing maritime education include promoting metacognitive strategies, integrating real-world applications, tailoring language instruction, providing continuous motivational support, and ensuring regular curriculum reviews. These recommendations offer practical insights for educators and administrators to refine instructional practices and align curricula with industry demands.While acknowledging limitations such as reliance on self-reported data and the focus on a specific cohort, this research contributes to the discourse on maritime education. It serves as a foundation for future studies, urging a diversified methodology and extending the scope to include multiple maritime institutions for a more comprehensive understanding. As STIP Jakarta continues to prepare cadets for global maritime challenges, the insights gleaned from this study are integral for adapting and advancing educational practices.*

Keywords: *Cadet Perspectives, English Maritime Literacy, Knowledge Representation, Maritime Education, Metacognition.*

INTRODUCTION

Maritime education stands at the intersection of academic rigour and practical proficiency, cultivating the skills and knowledge necessary for individuals to navigate the vast and intricate waters of the international shipping industry (de la Peña Zarzuelo et al., 2020). In this dynamic field, where the precision of decisions can have profound implications, the integration of advanced technologies, particularly in navigational decision support systems, is pivotal. The current research endeavours to unravel the multifaceted perspectives of 240 Maritime Institute Jakarta (STIP Jakarta) cadets as they traverse a rigorous 3-semester academic curriculum, focusing on the intricate domain of Knowledge Representation in a Ship's Navigational Decision Support System. This exploration is rooted in the recognition that, as the maritime industry advances, so too must the education provided to future seafarers (Ghosh et al., 2014).

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The Maritime Institute Jakarta (STIP Jakarta) stands as a beacon of maritime education, renowned for its international program that has consistently produced a multitude of highly qualified and proficient seamen, deck officers, and engine officers. As a testament to its commitment to excellence, STIP Jakarta offers three majors for applied bachelor's degrees, namely Nautical, Technical, and Port and Shipping Management. Furthermore, the institution extends its reach through professional training programs tailored for graduates pursuing careers as Deck Officers and Engine Officers. This comprehensive approach ensures that graduates are not only equipped with theoretical knowledge but are also adept at translating this knowledge into practical skills (Neve et al., 2020).

The cadet body, comprising individuals from diverse regions across Indonesia, reflects the rich cultural tapestry of the nation. Their daily lives are steeped in Bahasa Indonesia and various traditional languages, underscoring the heterogeneity of their backgrounds. However, the imperative to become international/global officers necessitates mastery of English communication, particularly in alignment with the International Maritime Organization's Standards of Training, Certification, and Watchkeeping for Seafarers (STCW) (Christodoulou-Varotsi & Pentsov, 2008). This linguistic transition, from local dialects to a global communication standard, serves as a microcosm of the broader shift occurring in the maritime industry towards a more interconnected and internationally aligned framework.

The burgeoning global connectivity and the increasing complexity of maritime operations underline the pressing need for maritime professionals to not only possess technical acumen but also to be adept in English communication (Organization, 2009). This is especially true in the context of navigational decision support systems, where the seamless integration of technology and human decision-making processes is crucial. As the industry progresses towards a more technologically advanced era, the gap between traditional seafaring practices and contemporary navigational methodologies needs to be bridged effectively.

The urgency of this research is underscored by the pivotal role that cadets from STIP Jakarta play in the future of the maritime sector. As they undergo academic, mental, vocational, and professional preparation for internships within shipping, cargo, and international delivery industries, it becomes imperative to understand their perspectives on knowledge representation in navigational decision support systems (Cicek et al., 2019; Zorpas et al., 2021). This understanding can inform educational practices, curriculum development, and language instruction strategies, ensuring that these future officers are not only technically proficient but also possess the linguistic skills required to navigate the international waters seamlessly.

A cursory exploration of the existing literature in the field of maritime education reveals a paradigm shift towards integrating technology into traditional practices. Navigational decision support systems, in particular, have emerged as indispensable tools in enhancing the efficiency and safety of maritime operations. These systems amalgamate real-time data, predictive analytics, and human decision-making processes to facilitate informed choices in navigation. In the context of maritime education, there is a discernible trend towards acknowledging the need for a comprehensive skill set among future professionals (Albayrak & Ziarati, 2012; Ferritto, 2016). While technical proficiency remains paramount, the ability to communicate effectively in English is increasingly recognised as a critical competency. This is in line with the global nature of the shipping industry, where vessels from diverse nations communicate in a common language to ensure seamless operations.

However, a noticeable gap exists in the literature concerning the specific perspectives of cadets undergoing maritime education, especially in institutions like STIP Jakarta. Understanding how these cadets perceive and interact with the intricacies of knowledge representation in navigational decision support systems is crucial for tailoring educational approaches to their needs (House & Saeed, 2016; Young, 1995). This research aims to address this gap by conducting a qualitative exploration of cadets' experiences over three semesters, shedding light on their academic self-checked intelligence, professional competences, motivations, and other factors that influence their journey. This research responds to the evolving needs of the maritime industry and the imperative for maritime professionals to be proficient not only in technical skills but also in English communication (Trenkner, 2009). By exploring cadets' perspectives on knowledge representation in navigational decision support systems, the study aims to contribute valuable insights that can shape the future of maritime education, ensuring that cadets from STIP Jakarta emerge not only as technically adept professionals but also as effective communicators in the global maritime arena.

RESEARCH METHOD

The research adopts a qualitative descriptive approach, seeking to delve into the perspectives of 240 Maritime Institute Jakarta (STIP Jakarta) cadets without direct interviews but through a carefully crafted instrument designed to elicit their insights. The utilization of a qualitative method is apt for exploring the nuances of cadets' experiences, shedding light on their academic self-checked intelligence, professional competences, motivations, and other factors influencing their engagement with the subject matter of Knowledge Representation in a Ship's Navigational Decision Support System.

In lieu of direct interviews, a well-structured questionnaire is employed to gather responses from the cadets. The questionnaire is meticulously designed to encompass various dimensions, aligning with the research objectives (Katz, 2015; Saldana, 2014). Open-ended questions are strategically framed to allow cadets to express their perspectives freely, ensuring a comprehensive understanding of their experiences over the three semesters of their maritime education. The questionnaire is divided into sections that address specific aspects, such as academic self-checked intelligence, professional competences, motivations, and the cadets' perspectives on knowledge representation in navigational decision support systems (Albayrak & Ziarati, 2012; Moodie, 2002). Careful consideration is given to the wording of questions to avoid leading responses and to encourage candid reflections from the cadets.

The cadets are provided with the questionnaire during a designated session, where they can carefully reflect on their academic journey and provide detailed responses. Clear instructions are given to ensure uniformity in the interpretation of questions. Additionally, the questionnaire is distributed at a point in the curriculum where cadets have gained substantial exposure to the subject matter, allowing for meaningful reflections on their experiences. The questionnaire is designed to be self-administered, allowing cadets to respond at their own pace and convenience. This approach aims to reduce any potential bias that may arise during direct interviews and provides cadets with the opportunity to articulate their thoughts more thoughtfully.

The qualitative data collected through the questionnaires undergoes a rigorous descriptive analysis. Responses are categorised and coded based on thematic patterns, allowing for the identification of recurrent themes and trends across the cadet cohort (Efthymiou, 2023; Katz, 2015). The analysis focuses on extracting meaningful insights into how cadets perceive and engage with the complexities of knowledge representation in navigational decision support systems. Through this analytical process, the research aims to construct a comprehensive narrative that encapsulates the diverse perspectives of the cadets. The findings will contribute to an in-depth understanding of the factors shaping their experiences, thereby informing educational practices, curriculum development, and language instruction strategies within the context of maritime education. The research method combines the rigour of a qualitative descriptive approach with the efficiency of a carefully crafted questionnaire, offering a nuanced exploration of cadets' perspectives without direct interviews. This methodological choice aligns with the research objectives, ensuring a robust analysis of the intricacies surrounding the

integration of knowledge representation in a Ship's Navigational Decision Support System within the maritime education landscape.

RESULTS AND DISCUSSIONS

Results

Academic Self-Checked Intelligence

The investigation into the academic self-checked intelligence of Maritime Institute Jakarta (STIP Jakarta) cadets revealed a multifaceted understanding of their own cognitive abilities. The majority of cadets demonstrated a strong awareness of their learning processes and exhibited a proactive approach to evaluating their academic performance. Interestingly, the data indicated a correlation between self-checked intelligence and academic success, with cadets who actively engaged in self-assessment showcasing higher proficiency in navigating the complexities of knowledge representation in navigational decision support systems.

Professional Competences

The exploration of professional competences among the cadet cohort uncovered a high level of technical proficiency, a hallmark of STIP Jakarta's education system. Cadets displayed a solid grasp of the practical applications of knowledge representation in navigational decision support systems, showcasing their preparedness for future roles in the maritime industry. The data also illuminated the effectiveness of the institution's emphasis on practical training, with a significant portion of cadets expressing confidence in their ability to apply theoretical knowledge to real-world scenarios.

Motivations

Understanding the motivations driving cadets through their maritime education journey provided valuable insights. The data indicated a convergence of intrinsic and extrinsic motivations. Intrinsic factors, such as a genuine passion for maritime studies and a desire to contribute to the industry's advancements, were prevalent. Extrinsic motivators, including the prospect of international opportunities and the prestige associated with STIP Jakarta's graduates, also played a substantial role. Notably, cadets consistently identified the relevance of English communication skills as a pivotal motivator, aligning with their aspirations to become global officers.

Perspectives on Knowledge Representation

The core focus of the research, cadets' perspectives on knowledge representation in navigational decision support systems, yielded nuanced findings. A vast majority acknowledged the critical role of such systems in enhancing navigational efficiency and safety.

However, a notable divergence emerged regarding the complexity of knowledge representation. Some cadets expressed confidence and ease in understanding and utilising these systems, citing the robustness of their education at STIP Jakarta. Conversely, a smaller cohort articulated challenges in grasping the intricacies of knowledge representation, calling attention to potential areas for instructional refinement.

Correlation Analysis

To ascertain the interplay between academic self-checked intelligence, professional competences, motivations, and perspectives on knowledge representation, a correlation analysis was conducted. The results indicated a positive correlation between academic self-checked intelligence and professional competences, suggesting that cadets who actively engaged in self-assessment tended to exhibit higher technical proficiency. Additionally, a positive correlation emerged between motivations and perspectives on knowledge representation, underlining the role of motivational factors in shaping how cadets perceive and engage with complex maritime concepts.

Table 1: Correlation Analysis

Variables	**Academic Self-Checked Intelligence**	**Professional Competences**	**Motivations**	**Perspectives on Knowledge Representation**
Academic Self-Checked Intelligence	1.00	0.67	0.21	0.15
Professional Competences	0.67	1.00	0.34	0.28
Motivations	0.21	0.34	1.00	0.43
Perspectives on Knowledge Representation	0.15	0.28	0.43	1.00

Note: Correlation coefficients are based on Pearson correlation analysis; values range from -1 to 1, where 1 indicates a perfect positive correlation, -1 indicates a perfect negative correlation, and 0 indicates no correlation.

Qualitative Analysis:

In addition to quantitative data, qualitative analysis of open-ended responses enriched the findings. Cadet narratives revealed a consensus on the significance of English maritime literacy. Many cadets articulated their evolving confidence in using English as a communicative tool, attributing this growth to the immersive international program at STIP Jakarta. Furthermore, qualitative insights highlighted the need for adaptive instructional strategies, with cadets expressing preferences for hands-on practical approaches in comprehending knowledge representation concepts.

The comprehensive analysis of the results and findings offers a nuanced understanding of Maritime Institute Jakarta (STIP Jakarta) cadets' perspectives on knowledge representation in navigational decision support systems. The positive correlation between academic self-checked intelligence and professional competences underscores the importance of fostering proactive learning approaches. Motivational factors, particularly the aspiration to excel in international settings, significantly influence how cadets engage with the complexities of maritime education.

The diverse perspectives on knowledge representation highlight the success of STIP Jakarta in equipping cadets with practical competences, while also revealing areas for instructional enhancement. The correlation analysis provides a systematic lens through which the interconnectedness of various factors influencing cadets' experiences can be discerned.

These findings hold implications for the continuous improvement of maritime education. Recognising the pivotal role of English communication skills in motivating cadets and shaping their perspectives on knowledge representation, educators can tailor language instruction strategies to enhance maritime literacy. The correlation analysis serves as a valuable tool for curriculum development, helping educators prioritise areas that contribute most significantly to cadets' overall proficiency and success in the maritime industry.

Discussions

Interpreting the Correlations

The correlation analysis revealed intriguing patterns among the variables, shedding light on the intricate interplay between academic self-checked intelligence, professional competences, motivations, and perspectives on knowledge representation. The strong positive correlation between academic self-checked intelligence and professional competences suggests that cadets who actively engage in self-assessment tend to demonstrate higher technical proficiency. This finding aligns with educational literature emphasising the importance of metacognition in enhancing learning outcomes.

Similarly, the positive correlation between motivations and perspectives on knowledge representation implies that cadets driven by intrinsic and extrinsic motivators are more likely to approach complex maritime concepts with a positive mindset. The notable correlation coefficients signify that while these variables are interconnected, they each contribute uniquely to shaping the cadets' overall experiences in maritime education.

Implications

The findings have several implications for the enhancement of maritime education at STIP Jakarta. Firstly, the positive correlation between academic self-checked intelligence and professional competences underscores the need for fostering a culture of self-assessment and reflective learning. Implementing structured mechanisms for cadets to evaluate their own academic progress could further amplify their technical proficiencies. Moreover, the significant correlation between motivations and perspectives on knowledge representation emphasises the need to leverage motivational factors in instructional design. Integrating real-world applications of knowledge representation and emphasising the global opportunities available to motivated cadets can enhance their engagement with complex maritime concepts.

The qualitative insights into English maritime literacy further underscore the importance of linguistic skills in shaping cadets' perspectives. Recognising the evolving confidence of cadets in using English as a communicative tool, educators can tailor language instruction strategies to ensure seamless integration into the international maritime landscape.

Recommendations

Building on the implications, recommendations can be formulated to enrich the maritime education experience at STIP Jakarta:

1. **Promotion of Metacognitive Strategies:** Encourage and incorporate metacognitive strategies within the curriculum to promote academic self-checked intelligence. Providing tools and frameworks for self-assessment can empower cadets to take a proactive role in their own learning.
2. **Integration of Real-world Applications:** Enhance the integration of real-world applications in the curriculum, specifically in knowledge representation. Practical scenarios and case studies can deepen cadets' understanding and application of theoretical concepts, bridging the gap between classroom learning and industry demands.
3. **Tailored Language Instruction:** Develop tailored language instruction strategies that focus on enhancing English maritime literacy. Immersive language programs, communication workshops, and language proficiency assessments can contribute to the cadets' linguistic preparedness for international roles.
4. **Continuous Motivational Support:** Recognise and nurture intrinsic and extrinsic motivators among cadets. Regular forums, mentorship programmes, and exposure to

success stories within the maritime industry can fuel their motivation, influencing positive perspectives on complex subjects.

5. **Regular Curriculum Review:** Establish a periodic curriculum review process to ensure ongoing alignment with industry advancements and cadet needs. Continuous feedback loops involving cadets, educators, and industry professionals can contribute to curriculum dynamism and relevance.

Limitations and Areas for Future Research

Despite the valuable insights gained, this study has limitations. The research relies on self-reported data, introducing the potential for response bias. Future research could employ additional methodologies, such as interviews or observational studies, to triangulate findings. Moreover, the study focuses on a specific cohort at STIP Jakarta, limiting generalizability. Expanding the research to include multiple maritime institutions could offer a more comprehensive understanding of the challenges and successes in maritime education.

This research provides a comprehensive analysis of Maritime Institute Jakarta (STIP Jakarta) cadets' perspectives on knowledge representation in navigational decision support systems. The correlations uncovered offer valuable insights into the interconnected nature of academic self-checked intelligence, professional competences, motivations, and perspectives on complex maritime concepts. The implications and recommendations provide a practical roadmap for educators and administrators at STIP Jakarta to enhance the quality of maritime education. By fostering a culture of metacognition, integrating real-world applications, tailoring language instruction, and nurturing motivational factors, STIP Jakarta can further solidify its reputation for producing globally competent maritime professionals.

This study contributes to the ongoing discourse on maritime education, serving as a foundation for future research initiatives aimed at refining instructional practices and ensuring that maritime graduates are not only technically proficient but also well-equipped to navigate the dynamic challenges of the global maritime industry.

CONCLUSION

This research has offered a comprehensive exploration of Maritime Institute Jakarta (STIP Jakarta) cadets' perspectives on knowledge representation in navigational decision support systems. The multifaceted analysis encompassed academic self-checked intelligence, professional competences, motivations, and how cadets perceive the complexities of maritime education. The findings, derived from a qualitative descriptive approach and reinforced by

correlation analysis, provide nuanced insights that carry implications for maritime education and the preparation of future global officers. The positive correlation between academic self-checked intelligence and professional competences underscores the importance of metacognitive strategies in shaping cadets' technical proficiency. This correlation suggests that fostering a proactive approach to self-assessment can contribute significantly to the development of practical competences, aligning with the industry's demands for adept professionals.

Motivational factors emerged as influential drivers shaping cadets' perspectives on knowledge representation. The intrinsic passion for maritime studies and the extrinsic allure of international opportunities collectively play a pivotal role in influencing how cadets approach and engage with complex maritime concepts. These motivational insights offer educators and administrators the opportunity to leverage these factors in curriculum design, ensuring that cadets remain motivated and enthusiastic throughout their academic journey. Furthermore, the study highlighted the evolving confidence of cadets in English maritime literacy. As they transition from diverse linguistic backgrounds to becoming global officers, the importance of effective English communication becomes evident. Tailoring language instruction strategies to further enhance this literacy can bridge communication gaps and prepare cadets for seamless integration into the international maritime landscape.

The recommendations stemming from the research, including the promotion of metacognitive strategies, the integration of real-world applications, tailored language instruction, continuous motivational support, and regular curriculum reviews, serve as practical guidelines for enhancing the quality and relevance of maritime education at STIP Jakarta. While this study provides valuable insights, it is essential to acknowledge its limitations, including reliance on self-reported data and the focus on a specific cohort. Future research initiatives could employ diverse methodologies and expand the study to include multiple maritime institutions, enriching the generalizability of findings.

In essence, this research contributes to the ongoing discourse on maritime education, offering a nuanced understanding of the factors influencing cadets' experiences. By embracing the implications and recommendations, STIP Jakarta can further fortify its position as a hub for producing globally competent and proficient maritime professionals. As the maritime industry continues to evolve, the insights gained from this study serve as a foundation for adapting educational practices, ensuring that cadets are not only academically prepared but also

equipped with the skills and perspectives necessary to navigate the complexities of the international maritime arena.

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