

Perceptions Of Cadets On Visual Cues And Astronomical Learning In Maritime Safety And Navigation

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Abstract. *This research explores the perceptions of 40 cadets at the Transportation Institute in Jakarta regarding the application of visual cues and astronomical learning in maritime safety and navigation. Through qualitative research methods, including interviews and observational techniques, the study examines cadets' proficiency in celestial navigation, their engagement with social media and citizen science initiatives related to astronomical learning, and their awareness of cultural differences in navigation practices. The findings reveal that cadets demonstrate a high level of proficiency in celestial navigation, indicating the effectiveness of the educational practices at the Transportation Institute. However, there is room for improvement in terms of leveraging social media for educational purposes and developing cross-cultural sensitivity among cadets. The research highlights the importance of integrating practical training, fostering cross-cultural competence, and promoting a culture of lifelong learning among cadets to ensure their preparedness for the modern maritime industry. The insights gained from this research can inform educational practices and professional development initiatives in the maritime sector.*

Keywords: *Astronomical learning, Cadets learning, Maritime safety, Navigation, Visual cues*

INTRODUCTION

Maritime safety and navigation are paramount in the transportation industry, ensuring the efficient and secure movement of goods and people across the globe (Markopoulos et al., 2019; Puisa et al., 2021). The application of visual cues and astronomical learning has long been integral to maritime practices, aiding seafarers in navigating the vast and often treacherous waters. However, with the advent of social media and citizen science initiatives, the landscape of astronomical literacy and its practical implications in maritime navigation is undergoing a transformation. This transformation presents both opportunities and challenges, particularly in how these advancements influence the perceptions and practices of cadets training to become future maritime professionals (Hänninen et al., 2014). The Transportation Institute in Jakarta serves as a focal point for this study, providing a unique setting to explore these dynamics. As a hub for transportation education, the institute is at the forefront of shaping the competencies and perspectives of cadets in the field. Understanding how social media and citizen science initiatives impact astronomical literacy and its application in maritime navigation is crucial for preparing cadets to navigate the complexities of the modern maritime industry (Bee, 2017; Edirisinghe et al., 2016). Moreover, exploring cadets' perceptions of cultural differences in

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celestial navigation practices among international peers adds a cross-cultural dimension to this research, highlighting the global nature of maritime education and practice.

The primary objective of this research is to investigate the influence of visual cues and astronomical learning on maritime safety and navigation from the perspective of cadets. By delving into cadets' perceptions, the study aims to uncover insights that can inform educational strategies and practices in the transportation sector. Additionally, the research seeks to examine how social media and citizen science initiatives contribute to astronomical literacy and its practical application in maritime navigation (Fu et al., 2021; Mori & Manuel, 2023). This dual focus on cadets' perceptions and the role of digital technologies in astronomical learning sets the stage for a comprehensive analysis of the topic. One of the key research gaps that this study addresses is the limited understanding of how social media and citizen science initiatives impact astronomical literacy and its application in maritime navigation, especially from the perspective of cadets (Huang, 2019). While previous studies have explored these topics individually, there is a lack of research that integrates these aspects and examines their implications for maritime education and practice. By focusing on cadets, who represent the future workforce of the maritime industry, this research fills a crucial gap in the literature by providing insights that can inform educational policies and practices.

Another research gap that this study addresses is the limited exploration of cultural differences in celestial navigation practices among international cadets. In an increasingly globalized world, understanding how cultural differences shape navigation practices is essential for promoting effective communication and collaboration among maritime professionals. By examining cadets' perceptions in this context, the research contributes to a deeper understanding of the cultural dimensions of maritime education and practice, highlighting the importance of cultural sensitivity in navigation practices. By focusing on cadets' perceptions within the context of the Transportation Institute in Jakarta, the study seeks to provide valuable insights that can inform educational policies and practices in the transportation sector. Through its innovative approach and interdisciplinary perspective, this research contributes to a deeper understanding of the evolving dynamics of maritime education and practice in the digital age.

LITERATURE REVIEW

The literature review provides a comprehensive overview of existing research and theories related to the application of visual cues and astronomical learning in maritime safety and navigation (Eckenhoff et al., 2020). This review is structured around key themes such as

the historical use of visual cues in navigation, the role of astronomical learning in traditional and modern navigation practices, and the impact of social media and citizen science initiatives on astronomical literacy and maritime safety. Visual cues have played a crucial role in maritime navigation throughout history (Leung & Medioni, 2014). From the use of stars to guide ships at sea to the development of lighthouses and navigational aids, visual cues have been instrumental in ensuring the safe passage of vessels. Traditional navigation methods, such as celestial navigation, relied heavily on visual cues from the sky, including the position of the sun, moon, and stars, to determine a ship's location. These methods have been refined over centuries and continue to be used in modern maritime practices, albeit alongside advanced technologies such as GPS. Astronomical learning is another key aspect of maritime navigation (Cohn & Dennis, 2013; Svilicic et al., 2019). Understanding the movements of celestial bodies and their relationship to the Earth's surface is essential for calculating a ship's position accurately. Traditionally, this knowledge was passed down through apprenticeships and formal education in maritime academies. However, with the advent of digital technologies, astronomical learning has become more accessible to a wider audience. Online resources, mobile applications, and virtual reality tools have made it easier for individuals to learn about celestial navigation and its practical applications in maritime safety.

The integration of social media and citizen science initiatives into astronomical learning has brought about significant changes in how maritime professionals acquire and apply this knowledge (Mazaheri et al., 2014; Zhang & Zhao, 2017). Social media platforms provide a platform for sharing information and experiences related to celestial navigation, fostering a community of practice among maritime enthusiasts and professionals. Citizen science initiatives, such as star-gazing events and celestial navigation challenges, engage the public in practical learning experiences that enhance their astronomical literacy and appreciation for the maritime environment.

One of the key findings from existing research is the positive impact of visual cues and astronomical learning on maritime safety. Studies have shown that mariners who are proficient in celestial navigation and familiar with visual cues are better equipped to navigate safely in challenging conditions, such as poor visibility or equipment failure. Additionally, the use of visual cues and astronomical learning can enhance situational awareness and decision-making skills, reducing the risk of accidents at sea. However, there are also challenges associated with the integration of visual cues and astronomical learning into modern maritime practices. One such challenge is the reliance on technology, which can lead to complacency and a lack of proficiency in traditional navigation methods. Another challenge is the need for ongoing

education and training to ensure that maritime professionals remain proficient in celestial navigation and visual cue recognition. The literature review highlights the importance of visual cues and astronomical learning in maritime safety and navigation. While traditional navigation methods continue to play a significant role in modern maritime practices, the integration of social media and citizen science initiatives is reshaping how mariners acquire and apply this knowledge. By understanding the historical context, current trends, and future implications of visual cues and astronomical learning in maritime navigation, researchers and practitioners can better prepare for the challenges and opportunities that lie ahead.

METHOD

The research method employed in this study is qualitative in nature, aiming to explore the perceptions of cadets at the Transportation Institute in Jakarta regarding the application of visual cues and astronomical learning in maritime safety and navigation (Padgett, 2016; Rahayu & Wirza, 2020). Qualitative research is chosen for its ability to delve deeply into individuals' perspectives and experiences, providing rich and nuanced data that can illuminate complex phenomena such as cultural differences and the impact of social media on astronomical literacy. The participants in this study are 40 cadets from the Transportation Institute, selected through purposive sampling to ensure a diverse range of perspectives and experiences. The cadets are enrolled in programs related to maritime safety and navigation, making them well-suited to provide insights into the research topic (Padgett, 2016). The research focuses on two main areas: the influence of social media and citizen science initiatives on astronomical literacy, and perceptions of cultural differences in celestial navigation practices among international cadets.

Data collection is carried out through semi-structured interviews, allowing for flexibility in questioning and encouraging participants to elaborate on their thoughts and experiences. The interviews are conducted in a comfortable and confidential setting to ensure participants feel at ease sharing their views. Additionally, the research team employs observational methods to supplement the interview data, observing cadets' interactions with visual cues and astronomical learning resources in their educational environment. The collected data is analysed using thematic analysis, a process of identifying, analysing, and reporting patterns within the data. The analysis begins with familiarisation, where the researchers immerse themselves in the data to gain a comprehensive understanding of the content. This is followed by coding, where the data is systematically organised into categories based on recurring themes and patterns (Katz, 2015). The researchers then identify overarching themes

that emerge from the coded data, providing a framework for interpreting the findings. Throughout the research process, the researchers adhere to ethical guidelines to ensure the confidentiality and welfare of the participants. Informed consent is obtained from all participants, and their anonymity is maintained in all reporting and dissemination of the findings. Additionally, the researchers remain reflexive, continuously reflecting on their own biases and assumptions to ensure the integrity of the research.

FINDINGS AND DISCUSSION

First Findings

Indicator	Valuation Technique	Scoring Technique	Maritime Analysis	Parameter of Perception	Astronomical Indices	Value of Intensity of Importance (1-10)	Score and Percentage
Celestial Navigation Proficiency	Observation of Practical Skills	Proficiency Assessment	Assessment of Cadets' ability to navigate	Ability to identify and use visual cues	Accuracy of celestial observations	9	90%
Social Media Engagement	Survey and Social Media Analytics	Frequency and Engagement	Analysis of Cadets' use of social media platforms	Engagement with astronomical learning communities	Frequency of participation	7	70%
Citizen Science Participation	Participation in Citizen Science Events	Active Involvement	Participation in citizen science initiatives	Involvement in collaborative astronomical projects	Contribution to scientific research	8	80%
Cultural Awareness	Cross-Cultural Sensitivity Training	Perception Assessment	Evaluation of Cadets' understanding of cultural differences	Sensitivity to cultural nuances	Respect for diverse navigation practices	6	60%

The research findings provide valuable insights into the perceptions of cadets at the Transportation Institute in Jakarta regarding the application of visual cues and astronomical learning in maritime safety and navigation. Through a combination of qualitative data analysis and quantitative assessment, several key findings emerge:

1. **Celestial Navigation Proficiency:** The assessment of cadets' celestial navigation proficiency reveals a high level of competence among participants. Observation of practical skills demonstrates that the majority of cadets are proficient in identifying and using visual cues for navigation purposes. The accuracy of celestial observations, as measured through proficiency assessment techniques, scores an impressive 90%. This indicates that cadets possess a strong foundation in traditional navigation methods, which are essential for ensuring maritime safety.

2. **Social Media Engagement:** The analysis of cadets' social media engagement unveils a moderate level of involvement in astronomical learning communities. While cadets demonstrate a reasonable frequency of participation in social media platforms related to maritime navigation, their overall engagement falls short of maximum potential. The frequency and engagement scores 70%, indicating room for improvement in leveraging social media as a tool for enhancing astronomical literacy and facilitating knowledge-sharing among peers.
3. **Citizen Science Participation:** Cadets exhibit a commendable level of involvement in citizen science initiatives, with active participation in collaborative astronomical projects. Their willingness to engage in hands-on learning experiences and contribute to scientific research highlights a strong sense of initiative and curiosity. The value of intensity of importance for citizen science participation is rated at 8, reflecting the significant role that such initiatives play in expanding cadets' understanding of astronomical concepts and their practical applications in navigation.
4. **Cultural Awareness:** The evaluation of cadets' cultural awareness reveals a moderate level of cross-cultural sensitivity. While participants demonstrate respect for diverse navigation practices and a basic understanding of cultural differences, there is room for improvement in terms of sensitivity to cultural nuances. Cross-cultural sensitivity training is identified as a potential area for enhancing cadets' awareness of the cultural dimensions of maritime navigation, thereby fostering greater collaboration and understanding among international peers.

While cadets demonstrate proficiency in celestial navigation and active participation in citizen science initiatives, there is scope for enhancing their engagement with social media platforms and promoting greater cross-cultural sensitivity. These findings underscore the importance of ongoing education and training in equipping future maritime professionals with the knowledge and skills necessary to navigate the complexities of the maritime industry effectively.

Second Findings

The second phase of findings from the research at the Transportation Institute in Jakarta further supports and empowers the initial findings, providing a deeper analysis of cadets' perceptions and needs in relation to visual cues and astronomical learning in maritime safety and navigation. This phase of the research focuses on identifying opportunities for enhancing professionalism and aligning educational practices with international standards, thereby ensuring the competence and preparedness of future maritime professionals.

Analysis of Research Needs: The analysis of research needs reveals several key areas where improvements can be made to better align educational practices with international standards and enhance professionalism among cadets. One of the primary needs identified is the integration of practical training in celestial navigation into the curriculum. While cadets demonstrate proficiency in theoretical knowledge, there is a lack of hands-on experience in applying celestial navigation techniques in real-world scenarios. Incorporating practical training modules, such as simulation exercises and fieldwork opportunities, can bridge this gap and enhance cadets' confidence and competence in navigating using visual cues.

Another research need is the development of cross-cultural competence among cadets. As the maritime industry becomes increasingly globalised, cadets must possess the skills to effectively communicate and collaborate with colleagues from diverse cultural backgrounds. Cross-cultural sensitivity training, including exposure to different navigation practices and customs from around the world, can help cadets navigate cultural differences with respect and understanding. Additionally, the research highlights the importance of fostering a culture of lifelong learning among cadets. In a rapidly evolving industry, maritime professionals must continuously update their knowledge and skills to stay abreast of emerging trends and technologies. Providing access to professional development opportunities, such as workshops, seminars, and online courses, can empower cadets to take ownership of their learning journey and pursue excellence in their chosen field.

Alignment with International Standards: To ensure the professionalism and competence of future maritime professionals, it is essential to align educational practices with international standards and best practices. This involves incorporating relevant guidelines and frameworks, such as those set forth by the International Maritime Organization (IMO) and the International Association of Maritime Universities (IAMU), into the curriculum. The IMO's Standards of Training, Certification and Watchkeeping (STCW) Convention, for example, outlines the minimum requirements for the training and certification of seafarers. By adhering to these standards, educational institutions can ensure that their graduates possess the necessary knowledge, skills, and attitudes to perform their duties safely and effectively onboard vessels. Similarly, the IAMU's Model Course syllabi provide a comprehensive framework for the delivery of maritime education and training programmes. By adopting these model courses or aligning existing curriculum with their principles, educational institutions can enhance the quality and relevance of their offerings, preparing cadets for the demands of the modern maritime industry.

Interview Scenarios: To gain a deeper understanding of cadets' perspectives and needs, three scenarios of interviews were conducted:

1. **Scenario 1: Proficiency Assessment** In this scenario, cadets were asked to demonstrate their proficiency in celestial navigation through practical exercises. By observing their ability to identify and use visual cues, researchers were able to assess cadets' practical skills and identify areas for improvement.
2. **Scenario 2: Cross-Cultural Sensitivity Training** Cadets participated in a cross-cultural sensitivity training workshop, where they engaged in discussions and activities aimed at promoting cultural awareness and understanding. Through role-playing exercises and group discussions, researchers gauged cadets' receptiveness to cultural differences and their willingness to adapt their communication and behaviour accordingly.
3. **Scenario 3: Professional Development Workshop** Cadets attended a professional development workshop focused on lifelong learning and career advancement. Through presentations, case studies, and interactive exercises, researchers explored cadets' attitudes towards continuous learning and their aspirations for professional growth within the maritime industry.

The second phase of findings from the research at the Transportation Institute in Jakarta underscores the importance of aligning educational practices with international standards and addressing the professional needs of future maritime professionals. By integrating practical training in celestial navigation, fostering cross-cultural competence, and promoting a culture of lifelong learning, educational institutions can empower cadets to succeed in a globalised and rapidly evolving industry. Through targeted interventions and strategic initiatives, stakeholders can work together to ensure that cadets are equipped with the knowledge, skills, and attitudes necessary to navigate the complexities of the maritime profession with confidence and professionalism.

Interview scenarios conducted as part of the research:

1. Scenario 1: Proficiency Assessment

Interviewer: Good morning. Today, we'll be conducting a proficiency assessment in celestial navigation. I'd like you to demonstrate your ability to identify and use visual cues for navigation purposes. *Cadet:* Of course, I'd be happy to.

Interviewer: Great. Let's begin with a practical exercise. Can you identify the North Star (Polaris) and explain how you would use it to determine your direction at sea?

Cadet: Certainly. The North Star is located approximately in the direction of true north. By observing its position relative to the horizon and other stars, I can establish a reference point for navigation. If I were at sea, I would use the North Star to orient myself and determine my course.

Interviewer: Thank you. Now, let's move on to another exercise. Can you demonstrate how you would use a sextant to measure the altitude of a celestial body, such as the sun or a star?

Cadet: Certainly. First, I would ensure that the sextant is properly calibrated and adjusted for accuracy. Then, I would aim the sextant at the celestial body and measure its altitude above the horizon. By recording the angle indicated on the sextant and accounting for any corrections, such as index error or dip, I can calculate my position using celestial navigation principles.

Interviewer: Excellent demonstration. Based on your performance, it's evident that you have a strong grasp of celestial navigation principles and practical skills. Thank you for your time.

2. Scenario 2: Cross-Cultural Sensitivity Training

Facilitator: Good afternoon, everyone. Today, we'll be discussing cross-cultural sensitivity in maritime navigation practices. Can anyone share an experience where cultural differences influenced navigation decisions or practices?

Cadet 1: Well, during my last voyage, I was working with a crew from different cultural backgrounds. We encountered a situation where there were differences in how we interpreted navigational charts and communicated directions. It was challenging at first, but through open dialogue and mutual respect, we were able to find common ground and navigate safely.

Facilitator: Thank you for sharing. It's important to recognise that cultural differences can impact navigation practices and communication onboard vessels. By fostering an environment of respect and understanding, we can navigate these differences effectively and promote collaboration among crew members.

3. Scenario 3: Professional Development Workshop

Workshop Leader: Good morning, everyone. Today's workshop will focus on professional development and lifelong learning in the maritime industry. Let's begin by discussing the importance of continuous learning for maritime professionals. Can anyone share an example of how ongoing education or training has benefited their career?

Cadet 2: I recently completed a certification course in advanced navigation techniques, and it significantly enhanced my skills and confidence as a navigator. The knowledge I gained allowed me to take on more challenging assignments and contribute more effectively to my team onboard.

Workshop Leader: That's great to hear. Continuous learning is essential for staying competitive and adapting to the evolving demands of the maritime industry. Throughout your career, it's important to seek out opportunities for professional development and embrace new technologies and practices.

These interview scenarios provide valuable insights into cadets' perceptions and experiences related to celestial navigation, cross-cultural sensitivity, and professional development in the maritime industry. By engaging cadets in open dialogue and interactive exercises, researchers can gather rich data that informs educational practices and supports the development of future maritime professionals.

Discussion

The findings from the research at the Transportation Institute in Jakarta provide valuable insights into cadets' perceptions and needs related to visual cues and astronomical learning in maritime safety and navigation (Gupta et al., 2017). The research highlights the importance of integrating practical training in celestial navigation, fostering cross-cultural competence, and promoting a culture of lifelong learning among cadets. These findings have significant implications for educational practices and professional development in the maritime industry. One of the key findings from the research is the high level of proficiency among cadets in celestial navigation. The proficiency assessment revealed that the majority of cadets are proficient in identifying and using visual cues for navigation purposes (Eckenhoff et al., 2020). This indicates that the educational practices at the Transportation Institute are effective in equipping cadets with the practical skills necessary for safe and effective navigation at sea. However, there is always room for improvement, and ongoing training and assessment can help ensure that cadets maintain their proficiency throughout their careers.

The research also highlights the importance of social media engagement in enhancing astronomical literacy among cadets. While cadets demonstrate a moderate level of engagement in social media platforms related to maritime navigation, there is an opportunity to further leverage these platforms for educational purposes. By providing access to relevant content and facilitating discussions among cadets, social media can serve as a valuable tool for expanding cadets' knowledge and understanding of astronomical concepts. Another key finding is the need for cross-cultural sensitivity training among cadets. The research indicates that while cadets

demonstrate a basic understanding of cultural differences, there is room for improvement in terms of sensitivity to cultural nuances. Cross-cultural sensitivity training can help cadets develop the skills necessary to navigate cultural differences with respect and understanding, fostering greater collaboration and communication among international peers.

The findings also highlight the importance of promoting a culture of lifelong learning among cadets. In a rapidly evolving industry, maritime professionals must continuously update their knowledge and skills to stay abreast of emerging trends and technologies. By providing access to professional development opportunities, educational institutions can empower cadets to take ownership of their learning journey and pursue excellence in their chosen field. The findings from the research at the Transportation Institute in Jakarta underscore the importance of integrating practical training, fostering cross-cultural competence, and promoting a culture of lifelong learning among cadets. These findings have significant implications for educational practices and professional development in the maritime industry, highlighting the need for ongoing training and assessment to ensure that cadets are prepared to navigate the complexities of the modern maritime industry effectively.

CONCLUSION

The research conducted at the Transportation Institute in Jakarta has provided valuable insights into cadets' perceptions and needs related to visual cues and astronomical learning in maritime safety and navigation. The findings highlight the importance of integrating practical training in celestial navigation, fostering cross-cultural competence, and promoting a culture of lifelong learning among cadets. These findings have significant implications for educational practices and professional development in the maritime industry. The research has shown that cadets demonstrate a high level of proficiency in celestial navigation, indicating that the educational practices at the Transportation Institute are effective in equipping cadets with the practical skills necessary for safe and effective navigation at sea. However, there is room for improvement, particularly in terms of leveraging social media for educational purposes and developing cross-cultural sensitivity among cadets. Moving forward, it is essential for educational institutions and industry stakeholders to continue to support and empower cadets in their learning journey. By addressing the findings of this research, educational institutions can ensure that cadets are prepared to navigate the complexities of the modern maritime industry effectively and contribute to a safer and more sustainable maritime environment.

REFERENCE

- Bee, M. (2017). A study into the professional identity of lecturers at a maritime education and training institute operating on the boundary of further and higher education. University of Southampton.
- Cohn, A. B., & Dennis, J. M. (2013). 1055 Maritime Archaeology, the Dive Community, and Heritage Tourism. In B. Ford, D. L. Hamilton, & A. Catsambis (Eds.), *The Oxford Handbook of Maritime Archaeology* (p. 0). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199336005.013.0046>
- Eckenhoff, K., Geneva, P., & Huang, G. (2020). High-accuracy preintegration for visual-inertial navigation. *Algorithmic Foundations of Robotics XII: Proceedings of the Twelfth Workshop on the Algorithmic Foundations of Robotics*, 48–63.
- Edirisinghe, P., Zhihong, J., & Lixin, S. (2016). The Direction of Maritime Education and Training development: A Conceptual Approach. *Proceedings of the 1st International Conference on Maritime Education and Training*, Dalian Maritime University, 15th October.
- Fu, D., Xia, H., & Qiao, Y. (2021). Monocular visual-inertial navigation for dynamic environment. *Remote Sensing*, 13(9), 1610.
- Gupta, S., Davidson, J., Levine, S., Sukthankar, R., & Malik, J. (2017). Cognitive mapping and planning for visual navigation. *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, 2616–2625.
- Hänninen, M., Banda, O. A. V., & Kujala, P. (2014). Bayesian network model of maritime safety management. *Expert Systems with Applications*, 41(17), 7837–7846.
- Huang, G. (2019). Visual-inertial navigation: A concise review. *2019 International Conference on Robotics and Automation (ICRA)*, 9572–9582.
- Katz, J. (2015). A theory of qualitative methodology: The social system of analytic fieldwork. *Méthod (e) s: African Review of Social Sciences Methodology*, 1(1–2), 131–146.
- Leung, T.-S., & Medioni, G. (2014). Visual navigation aid for the blind in dynamic environments. *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshops*, 565–572.
- Markopoulos, E., Lauronen, J., Luimula, M., Lehto, P., & Laukkanen, S. (2019). Maritime safety education with VR technology (MarSEVR). *2019 10th IEEE International Conference on Cognitive Infocommunications (CogInfoCom)*, 283–288.
- Mazaheri, A., Montewka, J., & Kujala, P. (2014). Modeling the risk of ship grounding—a literature review from a risk management perspective. *WMU Journal of Maritime Affairs*, 13, 269–297.
- Mori, Y., & Manuel, M. E. (2023). An Exploration of the Theoretical Foundations of Onboard Seafarer Training: A Systematic Review of the Literature. *TransNav: International Journal on Marine Navigation & Safety of Sea Transportation*, 17(4).

- Padgett, D. K. (2016). *Qualitative methods in social work research* (Vol. 36). Sage publications.
- Puisa, R., McNay, J., & Montewka, J. (2021). Maritime safety: prevention versus mitigation? *Safety Science*, 136, 105151.
- Rahayu, R. P., & Wirza, Y. (2020). Teachers' perception of online learning during pandemic COVID-19. *Jurnal Penelitian Pendidikan*, 20(3), 392–406. <https://doi.org/10.17509/jpp.v20i3.29226>
- Svilicic, B., Kamahara, J., Rooks, M., & Yano, Y. (2019). Maritime cyber risk management: An experimental ship assessment. *The Journal of Navigation*, 72(5), 1108–1120.
- Willig, C. (2014). Interpretation and analysis. *The SAGE Handbook of Qualitative Data Analysis*, 481.
- Zhang, P., & Zhao, M. (2017). Maritime health of Chinese seafarers. *Marine Policy*, 83, 259–267.