

## THE RELATIONSHIP BETWEEN MARITIME ENGLISH CADETS' OCEAN LITERACY AND ECOLOGICAL WORLDVIEWS

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### ABSTRACT

Maritime English education plays an essential role in developing both professional competence and environmental awareness among future seafarers. Despite its significance, limited research has examined its relationship with environmental responsibility, particularly in relation to ocean literacy and ecological worldview. This study investigated the relationships among Maritime English competence, ocean literacy, and ecological worldview among cadets at Malahayati Maritime Polytechnic, Indonesia. A quantitative correlational design was employed involving 48 cadets. Data were collected using a Maritime English questionnaire, an Ocean Literacy instrument, and the Revised New Ecological Paradigm (NEP) Scale. Spearman correlation analysis revealed significant positive relationships between Maritime English competence and ocean literacy ( $\rho = 0.421$ ,  $p < 0.05$ ), Maritime English competence and ecological worldview ( $\rho = 0.397$ ,  $p < 0.05$ ), and ocean literacy and ecological worldview ( $\rho = 0.465$ ,  $p < 0.01$ ). The findings suggest that Maritime English competence is associated not only with professional communication skills but also with environmental knowledge and ecological attitudes. These results highlight the potential of integrating sustainability-related content into Maritime English instruction to promote environmentally responsible maritime professionals.

**Keywords:** Maritime English, Ocean Literacy, Ecological Worldview, Environmental Responsibility, Maritime Cadets

## INTRODUCTION

The maritime industry plays a crucial role in global trade by facilitating the movement of goods, services, and resources across international borders. Despite its economic importance, maritime activities are increasingly associated with environmental challenges, including marine pollution, biodiversity loss, ecosystem degradation, and climate-related risks. Addressing these challenges requires not only technological innovation and regulatory compliance but also the development of environmentally responsible human resources within the maritime sector. As future maritime professionals, cadets are expected to possess not only technical and communication competencies but also a strong commitment to environmental sustainability.

In response to these global challenges, maritime education has increasingly embraced sustainability-oriented approaches. One important concept within this framework is ocean literacy, which refers to an individual's understanding of the ocean's influence on people and the reciprocal influence of human activities on the ocean. Ocean literacy encompasses knowledge, understanding, awareness, and responsible decision-making related to marine environments and sustainability (Paredes-

(Paredes-Coral et al., 2021) ; (Wang & Gao, 2025). Developing ocean literacy is particularly important for maritime cadets because their future professional activities will directly interact with marine ecosystems. In addition to cognitive understanding, environmental responsibility is reflected through ecological worldview, which represents individuals' beliefs, values, and attitudes toward environmental issues. The Revised New Ecological Paradigm (NEP) has been widely used to assess ecological worldview and pro-environmental orientation across diverse educational contexts.

As one of the world's largest archipelagic nations, Indonesia depends heavily on marine resources and maritime transportation for its economic development and social welfare. Consequently, strengthening environmental awareness among future maritime professionals is particularly important in the Indonesian context, where marine sustainability and ocean governance have become national priorities. Maritime education institutions therefore play a strategic role in preparing cadets who are not only technically competent but also environmentally responsible.

Ocean literacy refers to how well a person understands how the ocean affects

their life and vice versa; it includes knowledge (cognitive), emotions/attitudes (affective), and actions/behaviours (behavioural) that contribute to the responsible use of marine environments (Paredes-Coral et al., 2021). Ecological worldview is defined by the New Ecological Paradigm (NEP) as a person's beliefs, values, and understanding of the relationship between humans and nature, specifically the extent to which an individual adopts an ecocentric rather than an anthropocentric orientation toward the environment (Dunlap et al., 2000). Although ocean literacy and ecological worldview are theoretically separate, they are complementary. Ocean literacy represents your cognitive and affective perception of the ocean and ecological worldview indicates the foundational value system you have that guides your connection to nature (the ecosystem as a whole).

Within maritime education, Maritime English occupies a strategic position that extends beyond communication competence. As English serves as the international language of maritime operations, it also functions as a medium for knowledge transfer, including concepts related to safety, regulation, and environmental protection principles.

Consequently, Maritime English learning can contribute not only to linguistic development but also to environmental awareness. Recent studies have emphasized the potential of integrating sustainability-related content into Maritime English instruction, enabling learners to engage with environmental issues while developing professional communication skills (Rasita Gloria Barus & Bernadtua Simanjuntak, 2023). Through exposure to authentic maritime materials, environmental case studies, and international maritime conventions, cadets can simultaneously develop language competence and environmental understanding.

Furthermore, previous studies in language education have demonstrated that integrating environmental themes into English language learning can enhance ecological awareness, critical thinking, and sustainability-oriented behaviour among learners. Environmental content provides meaningful contexts for language learning while fostering responsible attitudes toward environmental conservation (Nyoman Ardiana Listriyawati1, 2025). In maritime contexts, English proficiency has also been linked to improved compliance with safety procedures and environmental regulations, suggesting that language

competence may support environmentally responsible professional practices (Rasita et al., 2024). These findings indicate that Maritime English has the potential to function as an interdisciplinary platform connecting language learning, professional training, and environmental education

Despite these promising developments, empirical research examining the relationship between Maritime English learning and environmental responsibility remains limited. Existing studies have predominantly focused on Maritime English as a tool for communication, safety, and operational effectiveness, whereas environmental education has generally been investigated as a separate field. Moreover, previous studies tend to emphasize either cognitive dimensions, such as environmental knowledge, or affective dimensions, such as environmental attitudes, without examining both simultaneously. As a result, limited evidence is available regarding how Maritime English learning relates to both ocean literacy and ecological worldview within a unified analytical framework. This gap is particularly evident in maritime education in Indonesia, where quantitative evidence linking language learning and

environmental responsibility remains scarce.

To address this gap, the present study investigates the relationships among Maritime English competence, ocean literacy, and ecological worldview among cadets at Malahayati Maritime Polytechnic, Indonesia. Using a quantitative correlational design, this research seeks to provide empirical evidence regarding the extent to which Maritime English competence is associated with both cognitive and attitudinal dimensions of environmental responsibility. The novelty of this study lies in its integrative framework, which combines language education, ocean literacy, and ecological worldview within a single model of analysis.

The findings are expected to contribute to the advancement of sustainability-oriented maritime education by highlighting the broader educational role of Maritime English. In addition, the study provides practical implications for curriculum development by demonstrating how environmental content can be systematically integrated into Maritime English instruction to support the preparation of environmentally responsible maritime professionals.

## REVIEW OF RELATED LITERATURES

### 2.1 Maritime English Learning

Maritime English is a specialized branch of English for Specific Purposes (ESP) designed to support communication in maritime contexts, including navigation, safety procedures, ship operations, and international maritime communication. As English functions as the working language of the global maritime industry, competence in Maritime English is essential for ensuring effective communication, operational efficiency, and safety at sea. Beyond its communicative function, recent studies have highlighted its broader pedagogical role in developing learners' professional, cognitive, and intercultural competencies.

In recent years, Maritime English has increasingly been recognized as a medium for integrating interdisciplinary knowledge, particularly sustainability and environmental education. Contemporary maritime education emphasizes the importance of preparing cadets not only with technical and communication skills but also with environmental responsibility and ecological awareness. As maritime operations are closely associated with

environmental issues such as marine pollution, waste management, and sustainable shipping practices, Maritime English provides a strategic platform for introducing environmental concepts through authentic learning materials and professional communication contexts.

Previous studies have demonstrated the potential of Maritime English to support environmental learning. (Rasita Gloria Barus & Bernadtua Simanjuntak, 2023) found that integrating environmental topics into Maritime English instruction can enhance both communication competence and environmental literacy among maritime learners. Their study suggests that sustainability-related content enables students to connect language learning with real-world environmental challenges encountered in maritime professions. Similarly, sustainability-oriented Maritime English instruction has been identified as an effective approach for fostering environmental awareness while simultaneously improving language proficiency.

Recent developments in maritime education further support this perspective.

(Kim et al., 2023) argued that maritime education should adopt interdisciplinary approaches that integrate sustainability into professional training. Likewise, (Yurzhenko et al., 2025) demonstrated that the incorporation of environmental protection modules and digital learning platforms into Maritime English courses improves students' engagement and understanding of sustainability-related issues. These findings indicate that Maritime English is not merely a communication tool but also a vehicle for developing environmental knowledge, critical thinking, and responsible professional behaviour.

Despite these promising developments, empirical evidence examining the relationship between Maritime English learning and specific environmental outcomes remains limited. Most previous studies have focused on curriculum design, instructional innovation, or language proficiency development, while relatively few have investigated how Maritime English learning is associated with environmental constructs such as ocean literacy and ecological worldview. This gap highlights the need for further research exploring the role of Maritime English in fostering both

environmental knowledge and pro-environmental attitudes among maritime cadets.

## 2.2 Ocean Literacy

Ocean literacy refers to an individual's understanding of the ocean's influence on people and people's influence on the ocean. According to Paredes-Coral et al. (2021), ocean literacy encompasses knowledge of how marine environments shape human life and how human activities affect ocean systems. Initially developed to promote public understanding of marine science, the concept has evolved into a broader framework that emphasizes environmental responsibility, informed decision-making, and sustainable ocean stewardship.

Ocean literacy is increasingly recognized as a multidimensional construct that includes cognitive, affective, and behavioural components. It involves not only knowledge and understanding of marine ecosystems but also awareness, attitudes, and responsible actions toward ocean sustainability. In educational contexts, ocean literacy is considered an essential foundation for developing environmentally responsible citizens who are capable of making informed decisions

regarding marine conservation and sustainable resource management.

Recent studies have expanded the concept of ocean literacy beyond scientific knowledge alone. (Mckinley et al., 2023) proposed that ocean literacy should be viewed as a multidimensional construct that integrates knowledge, attitudes, values, communication, and responsible actions related to marine sustainability. Similarly, (Shellock et al., 2024)(Kelly et al., 2022) argued that ocean literacy plays a crucial role in achieving sustainable ocean futures by promoting informed decision-making and encouraging environmentally responsible behaviour. This broader perspective positions ocean literacy as a key component of sustainable ocean governance and environmental citizenship.

Ocean literacy has multiple dimensions, which include the cognitive dimension of marine science, marine ecosystems and state or federal regulations regarding protecting the oceans; as well as the affective and behavioural dimensions of having a positive attitude toward protecting the oceans and being willing to take actions to conserve the oceans and their resources (Mallick et al., 2023). Ocean literacy can be viewed as a holistic competency; an understanding of the ocean

as it pertains to responsible stewardship of the oceans includes three components: awareness of the ocean, values associated with the ocean, and both willingness and ability to take actions in a manner that demonstrates responsible stewardship of our marine environments.

Previous studies have demonstrated that ocean literacy plays a significant role in encouraging environmentally aware behaviour. (Chang et al., 2023) found that students with stronger ocean literacy are likely to demonstrate better awareness of marine sustainability issues. Similarly, (Wang & Gao, 2025) reported that ocean literacy positively influences individuals' intentions to engage in marine conservation practices. These findings suggest that ocean literacy contributes not only to knowledge acquisition but also to the development of pro-environmental attitudes and behaviours.

In educational settings, ocean literacy is often developed through both formal and non-formal learning experiences. (Mokos & Realdon, 2020) emphasized that integrating marine science education into curricula can significantly enhance students' understanding of ocean-related issues and strengthen environmental awareness. This perspective

is particularly relevant in maritime education, where future maritime professionals are expected to possess not only technical competencies but also a strong sense of responsibility toward marine environmental protection.

Despite its importance, research on ocean literacy within maritime education remains relatively limited, particularly in relation to language learning. Existing studies have primarily focused on marine science education, environmental education, or public awareness programs, while comparatively little attention has been given to the role of Maritime English learning in fostering ocean literacy. Consequently, empirical evidence examining how Maritime English learning contributes to the development of ocean literacy among maritime cadets remains scarce. This gap highlights the need for interdisciplinary research that connects language education with environmental knowledge and sustainability awareness within maritime education contexts.

### **2.3 Ecological Worldview**

Ecological worldview refers to an individual's beliefs, values, attitudes, and assumptions regarding the relationship between humans and the natural

environment. It reflects how people perceive environmental limits, ecological balance, and human responsibility toward nature. Ecological worldview is considered an important affective dimension of environmental responsibility because it influences how individuals interpret environmental issues and respond to sustainability challenges.

One of the most widely used instruments for assessing ecological worldview is the Revised New Ecological Paradigm (NEP) Scale developed by Dunlap et al. The NEP Scale measures pro-environmental beliefs through several dimensions, including limits to growth, anti-anthropocentrism, fragility of nature's balance, rejection of human exemptionalism, and the possibility of ecological crisis. These dimensions collectively capture individuals' perceptions of environmental sustainability and their beliefs regarding the interdependence between humans and nature.

A growing body of research suggests that ecological worldview is a significant predictor of environmentally responsible behaviour. Individuals who hold stronger pro-environmental beliefs are generally more supportive of

environmental protection policies and more likely to engage in sustainable practices (Kazazoglu, 2025). Ecological worldview therefore extends beyond environmental awareness, as it reflects deeper value systems that shape decision-making and behavioural intentions related to environmental conservation.

In educational contexts, ecological worldview is often influenced by both knowledge acquisition and learning experiences. Environmental education has been widely recognized as an effective approach for fostering environmental values and strengthening ecological awareness among learners. Recent studies indicate that sustainability-oriented educational programs can positively influence students' environmental attitudes and encourage greater responsibility toward natural resources. For example, (Nyoman Ardiana Listriyawati1, 2025) found that integrating sustainability themes into language learning activities significantly improved students' environmental awareness and pro-environmental attitudes.

These findings suggest that language education can contribute not only to cognitive learning outcomes but also to the development of environmental values. This

perspective is particularly relevant to Maritime English education, where environmental issues such as marine pollution, waste management, environmental regulations, and sustainable maritime practices are frequently incorporated into instructional materials. Through exposure to such content, learners may gradually develop stronger ecological beliefs and greater awareness of environmental responsibility.

However, most previous studies have examined ecological worldview in relation to environmental education, science education, or sustainability programs. Comparatively little attention has been given to the relationship between language learning and ecological worldview, particularly within specialized educational contexts such as Maritime English. Furthermore, existing studies often focus on either environmental knowledge or environmental attitudes separately, without investigating how language learning may contribute to both dimensions simultaneously. Consequently, empirical evidence regarding the relationship between Maritime English learning and ecological worldview among maritime cadets remains limited. This gap highlights the need for further research

exploring how language instruction may contribute to the development of environmental values and ecological perspectives within maritime education.

#### **2.4 Relationship Between Maritime English Learning, Ocean Literacy, and Ecological Worldviews**

The relationship between Maritime English learning, ocean literacy, and ecological worldview can be understood through the integration of cognitive and affective domains within environmental education. Maritime English is not merely a communication tool for maritime operations; it also serves as a medium through which learners access knowledge related to maritime safety, environmental regulations, pollution prevention, and sustainable maritime practices. Through exposure to such content, cadets may develop a deeper understanding of marine ecosystems and environmental challenges, thereby enhancing their ocean literacy.

From a cognitive perspective, language functions as a gateway to knowledge acquisition. In maritime contexts, international conventions, operational manuals, environmental guidelines, and safety procedures are predominantly communicated in English.

Consequently, greater proficiency in Maritime English may facilitate access to information concerning marine conservation, sustainable resource management, and environmental protection. Previous studies have suggested that language learning can facilitate critical thinking and environmental awareness, which are essential for developing pro-environmental behavior (Rasita Gloria Barus & Bernadtua Simanjuntak, 2023). Furthermore, improved Maritime English proficiency has been associated with better compliance with environmental regulations and sustainable maritime practices (Bernadtua Simanjuntak et al., 2023).

Ocean literacy, in turn, is considered a fundamental component of environmental responsibility. Individuals who possess a stronger understanding of ocean systems and human–ocean interactions are generally more capable of recognizing environmental problems and supporting sustainable practices (Chang et al., 2023); (Wang & Gao, 2025). Ocean literacy extends beyond scientific knowledge to include awareness, values, communication skills, and informed decision-making related to marine sustainability. As environmental knowledge increases, individuals are more

likely to develop positive attitudes toward ecological protection and responsible environmental behaviour.

This relationship is closely linked to the concept of ecological worldview, which reflects an individual's beliefs, values, and attitudes regarding the relationship between humans and nature. According to ecological literacy theory, environmental knowledge and awareness contribute to the development of pro-environmental values and ecological beliefs. Individuals who better understand environmental systems are generally more likely to recognize ecological limits, support environmental protection, and adopt sustainability-oriented perspectives. Therefore, higher levels of ocean literacy are expected to be associated with stronger ecological worldviews.

Although previous studies have separately examined Maritime English learning, ocean literacy, and ecological worldview, empirical investigations integrating these three constructs within a single analytical framework remain limited. Existing research has primarily focused on communication competence, environmental knowledge, or ecological attitudes as independent outcomes rather than examining their interconnected

relationships. Moreover, most studies discussing the integration of sustainability into Maritime English education have adopted conceptual or qualitative approaches, resulting in limited quantitative evidence regarding how language learning is associated with both cognitive and attitudinal dimensions of environmental responsibility. This limitation is particularly evident in maritime education settings and remains underexplored within the Indonesian context.

Based on the theoretical arguments and empirical evidence discussed above, this study proposes that Maritime English learning is positively associated with both ocean literacy and ecological worldview. Furthermore, ocean literacy is expected to be positively associated with ecological worldview. Examining these relationships may provide a more comprehensive understanding of how language education contributes to the development of environmentally responsible maritime professionals.

## **2.5 Previous Studies**

### **2.5.1 Environmental and Ocean Literacy in Education**

A substantial body of research has highlighted the importance of environmental literacy and ocean literacy in promoting environmentally responsible behaviour. Environmental literacy is generally understood as a combination of knowledge, attitudes, awareness, and behavioural intentions that enable individuals to make informed decisions regarding environmental issues. Previous studies have consistently shown that individuals with higher levels of environmental literacy tend to demonstrate stronger pro-environmental attitudes and greater willingness to engage in sustainable practices.

For example, (Mahinay et al., 2023) reported that students with higher environmental literacy exhibited greater awareness of environmental problems and stronger intentions to participate in conservation activities. Similarly, (Ardoin & Bowers, 2020) emphasized that environmental education contributes not only to cognitive development but also to affective and socio-emotional learning, which are essential for fostering long-term environmental responsibility.

Within marine contexts, ocean literacy has emerged as a key concept for understanding human–ocean relationships.

Studies have demonstrated that ocean literacy promotes awareness of marine environmental issues and encourages sustainable behaviours related to marine conservation (Chang et al., 2023) ; (Wang & Gao, 2025). Individuals with higher levels of ocean literacy are generally more capable of recognizing the ecological consequences of human activities and supporting environmental protection initiatives.

Despite these findings, most ocean literacy studies have been conducted in general educational settings. Comparatively little attention has been given to maritime institutions, where environmental knowledge is directly linked to future professional responsibilities. Moreover, findings from general educational contexts cannot be automatically generalized to maritime education because cadets operate in highly specialized environments where environmental knowledge is closely connected to professional decision-making and operational responsibilities at sea. As a result, the development of ocean literacy among maritime cadets remains an underexplored area requiring further investigation.

### 2.5.2 Sustainability Integration in Maritime Education

The integration of sustainability into maritime education has received increasing attention in response to global concerns regarding marine environmental degradation and sustainable maritime operations. Educational institutions are increasingly encouraged to prepare future maritime professionals who possess not only technical competencies but also environmental awareness and ethical responsibility.

Recent studies suggest that sustainability-oriented learning can positively influence students' environmental understanding and professional preparedness. (Cahyadi et al., 2025) highlighted the growing role of sustainability-oriented innovation within maritime sectors, emphasizing the importance of integrating environmental considerations into professional training. Likewise, Barus and Simanjuntak (2023) demonstrated that environmental topics such as marine pollution prevention, waste management, and MARPOL compliance can be effectively incorporated into Maritime English instruction.

These studies indicate that Maritime English has the potential to

function beyond its traditional communicative role by serving as a platform for sustainability education. However, existing research has largely focused on curriculum development, instructional strategies, and pedagogical implementation. Limited empirical evidence is available regarding whether such learning experiences are associated with broader environmental outcomes, including ocean literacy and ecological worldview. As a result, it remains unclear whether sustainability-integrated Maritime English instruction contributes only to communication competence or also supports the development of environmental knowledge and pro-environmental attitudes among cadets.

### 2.5.3 Application of Ocean Literacy and Ecological Worldview Frameworks

The Ocean Literacy Framework (OLF) and the Revised New Ecological Paradigm (NEP) Scale are among the most widely used frameworks for assessing environmental knowledge and environmental attitudes, respectively. Together, these frameworks provide a comprehensive perspective on environmental responsibility by capturing both cognitive and affective dimensions.

The Ocean Literacy Framework evaluates individuals' understanding of ocean systems, human–ocean interactions, and sustainability issues. Meanwhile, the NEP Scale measures ecological beliefs concerning environmental limits, human–nature relationships, and environmental sustainability. Previous research has demonstrated that both frameworks are effective tools for assessing environmental awareness and attitudes across diverse educational contexts (Mallick et al., 2023).

Furthermore, studies utilizing the NEP Scale consistently report positive associations between environmental knowledge and pro-environmental beliefs, suggesting that cognitive understanding often contributes to the formation of ecological values and attitudes. Nevertheless, the combined application of ocean literacy and ecological worldview frameworks remains relatively uncommon within maritime education research. In particular, few studies have employed both frameworks simultaneously to examine environmental responsibility among maritime cadets.

This limitation is especially evident in Indonesia, where empirical investigations integrating ocean literacy and ecological worldview within maritime

education remain scarce. Consequently, there is a need for studies that adopt a more comprehensive approach to understanding environmental responsibility among future maritime professionals. Examining these constructs simultaneously may provide a more holistic understanding of how cognitive understanding of marine issues is translated into environmental beliefs, values, and attitudes.

#### **2.5.4 Research Gap Identification**

Based on the literature reviewed above, several important research gaps can be identified. First, although previous studies have demonstrated the importance of sustainability integration within Maritime English instruction, empirical evidence examining its relationship with environmental responsibility remains limited. Existing studies primarily focus on pedagogical innovation rather than measurable environmental outcomes.

Second, research investigating ocean literacy and ecological worldview has generally been conducted independently, with limited efforts to examine both constructs within a unified analytical framework. Consequently, the interaction between environmental knowledge and environmental attitudes remains

insufficiently explored, particularly in maritime education settings.

Third, while Maritime English, ocean literacy, and ecological worldview have individually attracted scholarly attention, studies examining the relationships among these three variables simultaneously remain scarce. This gap is particularly noticeable within Indonesian maritime education, where quantitative evidence linking language learning with environmental responsibility is still limited.

Therefore, the present study seeks to address these gaps by examining the relationships among Maritime English learning, ocean literacy, and ecological worldview among maritime cadets. By integrating these constructs into a single analytical framework, this study aims to contribute to a more comprehensive understanding of how language education may support environmental responsibility in maritime contexts.

## 2.6 Conceptual Framework and Hypotheses

This study conceptualizes Maritime English learning as a strategic platform for embedding environmental values among maritime cadets. In this framework, ocean literacy represents the cognitive dimension of environmental understanding, while ecological worldview reflects the attitudinal dimension. Maritime English learning is hypothesized to be associated with both constructs, as it provides exposure to environmental concepts through language instruction. Through access to environmental regulations, sustainability-related materials, and maritime communication practices, Maritime English may contribute to the development of environmental knowledge and awareness. In turn, greater ocean literacy is expected to strengthen ecological worldview by fostering positive environmental beliefs and values.

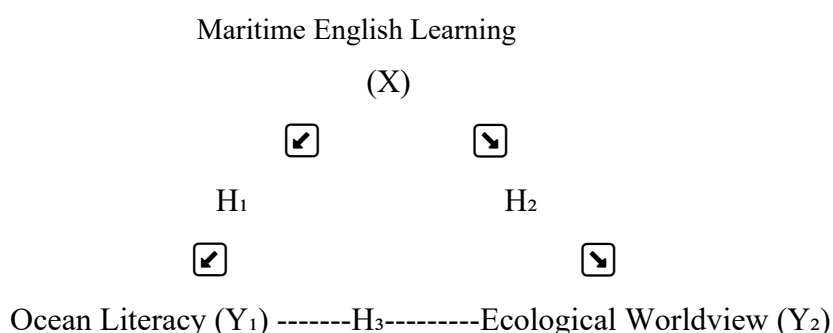


Figure 1. Conceptual Framework of the Study

Figure 1 illustrates the conceptual framework of the study. Maritime English Learning is proposed as the primary educational factor influencing both Ocean Literacy and Ecological Worldview among maritime cadets. Ocean Literacy represents the cognitive dimension of environmental responsibility, while Ecological Worldview reflects the attitudinal dimension. The framework assumes that Maritime English learning facilitates access to environmental knowledge and sustainability-related concepts, thereby enhancing cadets' ocean literacy. Furthermore, increased ocean literacy is

expected to contribute to a stronger ecological worldview through the development of pro-environmental beliefs and values.

### **Hypotheses**

H<sub>1</sub>: Maritime English learning is significantly associated with cadets' ocean literacy.

H<sub>2</sub>: Maritime English learning is significantly associated with cadets' ecological worldview.

H<sub>3</sub>: Ocean literacy is significantly associated with cadets' ecological worldview

## **METHODS**

### **3.1 Research Design**

This study employed a quantitative correlational research design to investigate the relationship among Maritime English competence, ocean literacy and ecological worldview among maritime cadets. A correlational approach was considered appropriate because the study aimed to examine the degree of association among variables without manipulating any conditions or treatments. The use of correlational design is consistent with previous studies in maritime education, which commonly investigate the

relationship between English proficiency, safety awareness, and environmental responsibility (Simanjuntak et al., 2024).

### **3.2 Research Setting and Participants**

This study was conducted at Malahayati Maritime Polytechnic, Indonesia, from December 2025 to March 2026. The participants consisted of 48 maritime cadets enrolled in maritime-related study programs during the 2025/2026 academic year. A total sampling technique was employed because the number of accessible cadets who met the research criteria was relatively limited. By including all eligible members of the target

population, total sampling helped minimize sampling bias and provided a more comprehensive representation of the population under investigation.

The participants were selected based on two inclusion criteria: (1) they had completed at least one semester of Maritime English courses, and (2) they were willing to participate in the study by completing the research questionnaire. In addition, all participants had been exposed to maritime safety and environmental topics as part of their academic curriculum. Therefore, they were considered appropriate respondents for examining the relationships among Maritime English competence, ocean literacy, and ecological worldview.

A total of 48 cadets met these criteria and participated in the study. To ensure ethical research practices, participation was voluntary and all respondents' identities were kept confidential throughout the research process.

### **3.3 Research Instruments**

Data were collected using a questionnaire consisting of three sections. The first section measured Maritime English competence through three dimensions: General English, Marine

Communication, and English for Environment. The second section measured ocean literacy based on four dimensions: knowledge, understanding, awareness, and attitude. The third section measured ecological worldview using the Revised New Ecological Paradigm (NEP) Scale, which includes five dimensions: Limits to Growth, Anti-Anthropocentrism, Fragility of Nature's Balance, Rejection of Exemptionalism, and Possibility of Eco-Crisis.

All questionnaire items were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The use of Likert-scale questionnaires and internal consistency testing is consistent with established practices in environmental attitude measurement, including studies using the NEP scale (Dunlap, 1859).

### **3.5 Validity and Reliability**

To ensure the quality of the instruments, validity and reliability tests were conducted prior to data analysis. Reliability was assessed using Cronbach's Alpha, with a minimum acceptable threshold of 0.70 (Soegiyono, 2011).

The Instrument validity was examined using Corrected Item–Total Correlation. All items exceeded the

minimum acceptable threshold of 0.30, indicating satisfactory construct validity. Reliability analysis yielded a Cronbach's Alpha coefficient of 0.931 for the 27-item instrument, demonstrating excellent internal consistency.

### 3.6 Data Collection and Analysis

The questionnaires were administered directly to the participants from December 2025 to March 2026. Descriptive statistics were used to

summarize participants' Maritime English competence, ocean literacy, and ecological worldview. Prior to inferential analysis, data normality was assessed using the Shapiro–Wilk test. Since the data were not normally distributed ( $p < 0.05$ ), Spearman's rank correlation was employed to examine relationships among variables. Chi-square analyses were additionally conducted to explore associations among categorized variables.

## RESULTS AND DISCUSSION

### 4.1 Interpreting Maritime English Competence in a Sustainability Context

Table 1. Descriptive Statistics of Maritime English Competence

Dimension	N	Minimum	Maximum	Mean	Std. Deviation
General English	48	5	20	13.54	3.549
Marine Communication	48	3	15	10.00	2.650
English for Environment	48	3	15	10.29	2.975

The findings indicate that cadets demonstrate relatively strong competence in Maritime English across all measured dimensions. The highest mean score was found in General English ( $M = 13.54$ ), suggesting that cadets possess a solid linguistic foundation for accessing and interpreting both technical maritime information and environmental knowledge. Meanwhile, the relatively balanced scores in Marine

Communication ( $M = 10.00$ ) and English for Environment ( $M = 10.29$ ) indicate that cadets have developed domain-specific communication skills relevant to maritime operations and environmental contexts.

However, the higher standard deviation observed in General English ( $SD = 3.549$ ) suggests variation in language proficiency among participants. This finding indicates that while some cadets demonstrate strong language

competence, others may experience difficulties in understanding specialized maritime and environmental terminology. Such disparities may affect their ability to access international maritime regulations, environmental guidelines, and sustainability-related information that are predominantly presented in English.

These findings support the view that Maritime English serves not only as a communication tool but also as a medium for transmitting professional and environmental knowledge. In line with the concept of English for Specific Purposes (ESP), Maritime English provides opportunities for integrating language learning with sustainability-related topics, including marine pollution prevention, environmental regulations, and responsible maritime practices. This

interpretation is consistent with previous studies highlighting the role of Maritime English in promoting both professional competence and environmental awareness (Rasita Gloria Barus & Bernadtua Simanjuntak, 2023).

The findings also suggest that strengthening Maritime English competence may contribute to the development of ocean literacy and ecological awareness among cadets. Therefore, language instruction should continue to incorporate sustainability-oriented content while providing additional support for learners with lower proficiency levels through contextualized vocabulary instruction, authentic materials, and task-based learning activities related to environmental issues in maritime settings.

## 4.2 Interpreting Ocean Literacy of Cadets

Table 2. Descriptive Statistics of Ocean Literacy

Dimension	N	Minimum	Maximum	Mean	Std. Deviation
Knowledge	48	2	10	8.02	2.078
Understanding	48	2	10	7.33	2.127
Awareness	48	1	5	4.04	1.110
Attitude	48	2	10	7.83	2.319

The results indicate that cadets demonstrate a generally good level of ocean literacy. The highest mean score

was recorded in the Knowledge dimension ( $M = 8.02$ ), followed by Attitude ( $M = 7.83$ ) and Understanding

( $M = 7.33$ ). These findings suggest that cadets possess adequate knowledge of marine issues and generally positive attitudes toward ocean sustainability. Such results are encouraging given the important role of future maritime professionals in supporting marine environmental protection.

However, the Awareness dimension obtained the lowest mean score ( $M = 4.04$ ), indicating that practical awareness and active engagement in environmental actions remain relatively limited. This pattern suggests a gap between environmental knowledge and its application in real-life situations. Although cadets understand marine environmental issues and express positive attitudes toward sustainability, they may not yet consistently translate this understanding into environmentally responsible behaviour.

This finding is consistent with previous studies reporting that environmental knowledge does not automatically lead to behavioural change. Ocean literacy is a multidimensional

construct encompassing cognitive, affective, and behavioural components. Therefore, strong knowledge and attitudes alone are insufficient if they are not accompanied by active participation in environmental protection activities. In maritime education, this issue is particularly important because future seafarers are expected not only to understand marine ecosystems but also to contribute directly to their preservation.

The findings highlight the need for more experiential and practice-based learning approaches within maritime education. Activities such as environmental simulations, case studies on marine pollution, onboard waste management projects, and sustainability-focused Maritime English tasks may help strengthen the awareness dimension of ocean literacy. Enhancing this dimension is essential to ensure that cadets develop into environmentally responsible maritime professionals who can effectively apply their environmental knowledge in professional practice.

### 4.3 Interpreting Ecological Worldview (NEP)

Table 3. Descriptive Statistics of Ecological Worldview (NEP Scale)

Dimension	N	Minimum	Maximum	Mean	Std. Deviation
Limits to Growth	48	3	15	11.29	3.358
Anti-Anthropocentrism	48	2	10	7.54	2.306
Fragility of Nature's Balance	48	2	10	7.60	2.121
Rejection of Exemptionalism	48	1	5	3.38	1.248
Possibility of Eco-Crisis	48	2	10	7.19	2.367

The findings indicate that cadets generally demonstrate a positive ecological worldview across most dimensions of the Revised New Ecological Paradigm (NEP). The highest mean score was observed in the Limits to Growth dimension ( $M = 11.29$ ), suggesting strong recognition of environmental limits and the importance of sustainable resource management. Similarly, the relatively high scores for Fragility of Nature's Balance ( $M = 7.60$ ), Anti-Anthropocentrism ( $M = 7.54$ ), and Possibility of Eco-Crisis ( $M = 7.19$ ) indicate that cadets acknowledge the vulnerability of ecosystems and recognize the environmental consequences of human activities.

However, the lowest mean score was found in the Rejection of Exemptionalism dimension ( $M = 3.38$ ), a reverse-coded construct. This result suggests that some cadets may still hold beliefs that humans are less constrained by natural limits or that environmental

problems can be overcome primarily through human intervention. Such views indicate that ecological values have not been equally internalized across all dimensions of environmental belief.

These findings support the notion that ecological worldview develops gradually through the interaction of knowledge, values, and educational experiences. Although cadets generally exhibit positive environmental beliefs, variations across dimensions suggest that some aspects of ecological thinking remain less developed than others. Similar patterns have been reported in previous environmental education studies, where awareness of environmental problems does not always translate into a fully developed ecological worldview.

From an educational perspective, the findings highlight the importance of strengthening environmental ethics, critical reflection, and sustainability-oriented learning experiences within maritime education. Integrating

environmental discussions and authentic sustainability issues into Maritime English instruction may help reinforce pro-environmental beliefs and encourage a deeper understanding of human–nature relationships. Overall, the results suggest

that cadets are progressing toward a positive ecological worldview, although continued educational efforts are needed to strengthen environmental values and address remaining misconception

#### 4.4 Correlation Analysis and Discussion

Table 4. Spearman Correlation among Variables

Variables	Spearman's $\rho$	Sig. (2-tailed)	Interpretation
Maritime English ↔ Ocean Literacy	0.421	0.015	Moderate, significant
Maritime English ↔ Ecological Worldview	0.397	0.021	Moderate, significant
Ocean Literacy ↔ Ecological Worldview	0.465	0.008	Moderate, significant

##### 1. Relationship between Maritime English and Ocean Literacy ( $H_{a1}$ )

The findings reveal a significant positive correlation between Maritime English competence and ocean literacy ( $\rho = 0.421$ ,  $p < 0.05$ ), indicating that cadets with higher levels of Maritime English proficiency tend to demonstrate better understanding of ocean-related knowledge, systems, and sustainability issues.

This relationship suggests that Maritime English functions as a gateway to environmental knowledge in maritime education. Since international maritime regulations, scientific publications, safety manuals, and environmental guidelines are predominantly available in English, language competence facilitates access to

information concerning marine ecosystems, pollution prevention, and sustainable maritime practices. Consequently, cadets with stronger Maritime English skills may have greater opportunities to engage with environmental content and develop a broader understanding of ocean-related issues.

The finding supports previous studies that emphasize the interdisciplinary role of language learning in promoting environmental literacy and sustainability awareness (Rasita Gloria Barus & Bernadtua Simanjuntak, 2023) ; (Nyoman Ardiana Listriyawati1, 2025). However,

the moderate strength of the correlation indicates that Maritime English competence alone does not fully explain variations in ocean literacy. While language proficiency may improve access to environmental information, the development of ocean literacy is also influenced by other factors, such as environmental education, personal experiences, institutional culture, and exposure to marine-related activities. This finding extends previous research by providing empirical evidence that Maritime English is associated not only

## **2. Relationship between Maritime English and Ecological Worldview (H<sub>a2</sub>)**

The analysis revealed a significant positive correlation between Maritime English competence and ecological worldview ( $\rho = 0.397$ ,  $p < 0.05$ ), indicating that cadets with higher levels of Maritime English proficiency tend to demonstrate more positive ecological beliefs and attitudes. Although the relationship is statistically significant, the correlation coefficient suggests a moderate association, implying that ecological worldview is influenced by factors beyond language competence alone.

with communication competence but also with environmental understanding. Nevertheless, the moderate correlation suggests that language learning should be complemented by experiential and sustainability-oriented learning activities. Integrating environmental case studies, problem-based learning, and authentic maritime scenarios into Maritime English instruction may further strengthen the contribution of language education to ocean literacy development among maritime cadets.

This finding suggests that Maritime English learning contributes not only to cognitive development but also to the affective dimension of environmental responsibility. Through exposure to environmental topics, international maritime conventions, and sustainability-related communication practices, cadets may develop greater awareness of environmental issues and a deeper appreciation of the relationship between human activities and marine ecosystems. In this sense, language learning functions as a medium through which environmental values are introduced and discussed.

The result supports previous studies indicating that sustainability-oriented language instruction can promote environmental awareness and pro-environmental attitudes (Rasita Gloria Barus & Bernadtua Simanjuntak, 2023) ; (Nyoman Ardiana Listriyawati1, 2025). However, the moderate strength of the correlation suggests that acquiring environmental information through language learning does not automatically lead to the development of a strong ecological worldview. Ecological beliefs are generally shaped through long-term interactions among knowledge, personal experiences, social influences, cultural values, and educational experiences.

This finding extends previous research by demonstrating that Maritime

### **3. Relationship between Ocean Literacy and Ecological Worldview (H<sub>a3</sub>)**

The strongest relationship identified in this study was between ocean literacy and ecological worldview ( $\rho = 0.465$ ,  $p < 0.01$ ). This finding indicates that cadets who possess greater understanding of ocean systems and human–ocean interactions tend to hold

English competence is associated with ecological worldview among maritime cadets. Nevertheless, the relatively moderate correlation indicates that language instruction alone may not be sufficient to foster deep ecological values. Therefore, Maritime English learning should be complemented by experiential activities such as environmental projects, sustainability-focused discussions, and reflective learning experiences that encourage cadets to critically evaluate environmental issues and their professional responsibilities. Such approaches may strengthen the internalization of ecological values and promote a more comprehensive environmental worldview.

stronger pro-environmental beliefs and attitudes.

This relationship supports the theoretical assumption that environmental knowledge contributes to the development of environmental values. Ocean literacy enables individuals to recognize the interconnectedness between human activities and marine ecosystems, thereby increasing awareness of

environmental consequences and the need for sustainable practices. As environmental understanding develops, individuals are more likely to adopt ecological perspectives that acknowledge environmental limits and the importance of conservation.

The finding is consistent with previous studies reporting positive associations between environmental knowledge and pro-environmental attitudes (Chang et al., 2023). However, the present study extends earlier research by demonstrating this relationship within a maritime education context. Unlike students in general educational settings, maritime cadets are preparing for professions that directly interact with marine environments. Consequently, ocean-related knowledge may be perceived as professionally relevant rather than merely academic, which could strengthen its influence on ecological beliefs.

Nevertheless, the correlation coefficient indicates a moderate rather than

## CONCLUSIONS

The study contributes to the growing body of literature on sustainability-oriented maritime education by extending the role of Maritime English beyond communication competence. The

strong relationship. This suggests that ecological worldview is influenced not only by knowledge but also by other factors such as personal experiences, social values, institutional culture, and direct engagement with environmental issues. In other words, understanding marine environmental problems does not automatically translate into deeply rooted ecological beliefs.

This interpretation is further supported by the descriptive findings, which revealed that the awareness dimension of ocean literacy obtained the lowest mean score among all dimensions. Although cadets demonstrated adequate knowledge and positive attitudes toward ocean sustainability, opportunities to transform this understanding into consistent environmental engagement may still be limited. This finding highlights a common challenge in environmental education: bridging the gap between knowing and acting.

findings suggest that Maritime English can serve as a strategic platform for promoting environmental awareness through the integration of sustainability-related content. Therefore, maritime education

institutions are encouraged to incorporate topics such as marine pollution prevention, MARPOL regulations, waste management, and sustainable shipping practices into Maritime English instruction. Contextual, problem-based, and experiential learning activities may further strengthen both communication skills and environmental responsibility among cadets.

There are a few limitations that should be noted for the current research. To start, the sample size of this study only represents a single institution in Indonesia. Hence, the findings from this study limit the generalizability of the results to the wider population of Maritime Education across many different institutions and countries. A larger sample size with a greater geographical dispersion would provide a better representation and statistical power. Secondly, the study relied upon the data collected via self-reported questionnaires, which may be subject to social desirability bias, especially for the measurement of ecologically oriented attitudes; hence,

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respondents may misrepresent their ecologically oriented attitudes.

Due to the above limitations, this research suggests directions for future research efforts. First, future research may benefit from larger sample sizes through multi-institutional analysis among selected maritime academies in Indonesia and other leading maritime countries, thus increasing the cross-cultural application and generalizability of results. Comparative studies between countries and educational systems would offer greater insights regarding how different cultural and institutional settings affect Maritime English learning and the environmental constructs used during class. Second, longitudinal designs may provide valuable data on the development of ocean literacy and eco-centric worldviews within cadets at various stages of their education, and allow for inferences to be made about the evolution of environmental responsibility across time frames.

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## REFERENCES

- Ardoin, N. M., & Bowers, A. W. (2020). *Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information. January.*
- Bernadtua Simanjuntak, M., Sutrisno, S., Kurnia Putrawan, B., Steven Lumingkewas, M., & Hutabarat, C. (2023). Enhancing Environmental Literacy through English Language Education in Maritime Institutions. *BIO Web of Conferences*, 79. <https://doi.org/10.1051/bioconf/20237911001>
- Cahyadi, T., Malau, A. G., Tinggi, S., Pelayaran, I., & Jakarta, N. (2025). *A Qualitative and Systematic Literature Review in Enhancing Maritime Sustainability through Electronic Agreements.*
- Chang, C., Tsai, L., & Meliana, D. (2023). *The Concept of Ocean Sustainability in High School : Measuring the Ocean Literacy of Vocational High School Students in Indonesia.*
- Dunlap, R. E., Liere, K. D. Van, Mertig, A. G., & Jones, R. E. (2000). *Measuring Endorsement of the New Ecological Paradigm : A Revised NEP Scale.* 56(3), 425–442.
- Kazazoglu, S. (2025). *Environmental Education Through Eco-Literacy : Integrating Sustainability into English Language Teaching.*
- Kelly, R., Evans, K., Alexander, K., Bettiol, S., Corney, S., Cullen-Knox, C., Cvitanovic, C., de Salas, K., Emad, G. R., Fullbrook, L., Garcia, C., Ison, S., Ling, S., Macleod, C., Meyer, A., Murray, L., Murunga, M., Nash, K. L., Norris, K., ... Pecl, G. T. (2022). Connecting to the oceans: supporting ocean literacy and public engagement. *Reviews in Fish Biology and Fisheries*, 32(1), 123–143. <https://doi.org/10.1007/s11160-020-09625-9>
- Kim, J., Lee, C., Jeong, M., & Cho, E. (2023). *Identifying Optimal Approaches for Sustainable Maritime Education and Training : Addressing Technological , Environmental , and Epidemiological Challenges.*
- Mahinay, H. A. C., Marapao, M. S. A., Jempero, J. hua B., & Allawan, J. G. L. (2023).

- Environmental Literacy Levels and Environmental Pollution among Senior High School Students. *Journal of Environmental Impact and Management Policy*, 36, 17–25. <https://doi.org/10.55529/jeimp.36.17.25>
- Mallick, D., Tsang, E. P. K., Lee, J. C. K., & Cheang, C. C. (2023). Marine Environmental Knowledge and Attitudes among University Students in Hong Kong: An Application of the Ocean Literacy Framework. *International Journal of Environmental Research and Public Health*, 20(6). <https://doi.org/10.3390/ijerph20064785>
- Mckinley, E., Burdon, D., & Shellock, R. J. (2023). The evolution of ocean literacy : A new framework for the United Nations Ocean Decade and beyond. *Marine Pollution Bulletin*, 186(November 2022), 114467. <https://doi.org/10.1016/j.marpolbul.2022.114467>
- Mokos, M., & Realdon, G. (2020). *How to Increase Ocean Literacy for Future Ocean Sustainability ? The Influence of Non-Formal Marine Science Education*.
- Nyoman Ardiana Listriyawati1, D. K. (2025). *Saintara : Jurnal Ilmiah Ilmu-Ilmu Maritim Integrating VoiceThread and TTSReader into Maritime English Education to Enhance Marine Management and Foster Sustainability*. September, 161–171.
- Paredes-Coral, E., Mokos, M., Vanreusel, A., & Deprez, T. (2021). Mapping Global Research on Ocean Literacy: Implications for Science, Policy, and the Blue Economy. *Frontiers in Marine Science*, 8(July), 1–12. <https://doi.org/10.3389/fmars.2021.648492>
- Rasita Gloria Barus, I., & Bernadtua Simanjuntak, M. (2023). Integrating Environmental Education into Maritime English Curriculum for Vocational Learners: Challenges and Opportunities. *BIO Web of Conferences*, 79. <https://doi.org/10.1051/bioconf/20237908001>
- Rasita, I., Barus, G., Simanjuntak, R., & Siahaan, R. Y. (2024). *Meteor stip marunda*. 17(1), 120–129.
- Shellock, R. J., Fullbrook, L., Mckinley, E., Cvitanovic, C., & Kelly, R. (2024). The nature and use of Ocean Literacy in achieving sustainable ocean futures : A Systematic Map. *Ocean and Coastal Management*, 257(August), 107325. <https://doi.org/10.1016/j.ocecoaman.2024.107325>
- Simanjuntak, M. B., Rafli, Z., & Utami, S. R. (2024). *Impact of english language proficiency on maritime safety and environmental protection*. 01002.

- Soegiyono. (2011). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*.
- Wang, L., & Gao, B. (2025). *The Promotive Effect of Ocean Literacy on Marine Conservation Behavior : A Qualitative Study Based on Chinese University Students*.
- Yurzhenko, A., Diahyleva, O., & Kononova, O. (2025). *An overview of Maritime English teaching and its principles , with a focus on practical applications and best practices online*.