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Conceptual & Case Study

Maritime-Based Ecotourism: A Simple Educational Model for Yacht Passengers to Enhance Marine Environment Sustainability

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Abstract: The rapid growth of maritime tourism in Banyuwangi, Indonesia, presents both significant economic opportunities and increasing pressure on fragile marine ecosystems. This article is framed as a conceptual and experiential case study that examines the role of passenger education in promoting marine environmental sustainability within yacht tourism operations. Drawing on participatory observation grounded in the author's professional experience as a yacht captain, the study identifies recurring patterns of environmentally detrimental passenger behaviour and develops a simple educational intervention embedded within routine operational practices. The proposed 5-Minute Pre-Sail Briefing model integrates concise sustainability messages into standard operating procedures, with emphasis on waste prevention, coral reef protection, and respectful interaction with marine life. The findings represent observational insights rather than empirical validation, suggesting that brief, context-specific educational communication has the potential to encourage pro-environmental behaviour among yacht passengers. Although the model is not intended to be generalisable, it demonstrates potential transferability to comparable small-scale maritime tourism contexts. Overall, this study underscores the importance of behavioural and educational strategies as complementary elements of sustainable maritime transport.

Keywords: maritime ecotourism; passenger education; marine sustainability; pro-environmental behaviour; yacht operations

1. Introduction

Maritime tourism constitutes a vital component of the blue economy while simultaneously posing substantial risks to fragile marine ecosystems. As coastal and marine destinations continue to attract domestic and international visitors, tourism activities increasingly interact with sensitive ecological zones, including coral reefs, seagrass beds, mangrove areas, and habitats of protected marine organisms. Yacht-based tourism can contribute to environmental degradation through waste generation, physical damage to coral reefs, and inadvertent disturbance of marine organisms arising from passenger behaviour [1], [2]. These impacts are often not caused by major operational failures, but by simple actions such as littering, touching coral, feeding marine animals, careless anchoring, or ignoring environmental instructions during recreational activities. Consequently, achieving sustainability in maritime tourism requires not only technological and managerial interventions, but also behavioural change supported by effective environmental education [3].

Banyuwangi, located at the eastern tip of Java, Indonesia, has emerged as a rapidly developing maritime tourism destination. Its strategic position near the Bali Strait, surrounding islands, and marine recreational routes has strengthened its role as a gateway for coastal and yacht-based

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tourism. Its surrounding waters, which are ecologically connected to Alas Purwo National Park and nearby islands, are characterised by high biodiversity and environmental sensitivity [4]. These marine areas support various ecological functions, including habitat provision, coastal protection, fisheries productivity, and nature-based tourism value. However, the increasing frequency of yacht visits to these areas has raised concerns regarding the long-term resilience of marine ecosystems if tourist behaviour remains insufficiently regulated and guided. Without proper awareness and onboard guidance, passengers may unintentionally contribute to cumulative environmental pressures that threaten the sustainability of the destination.

Existing literature on sustainable maritime transport predominantly emphasises engineering solutions, fuel efficiency, emission reduction strategies, vessel design improvement, and operational management [5], [6]. These studies have provided important contributions to reducing the environmental footprint of maritime operations, especially in relation to energy consumption and greenhouse gas emissions. However, in the context of small-scale maritime tourism, sustainability is also strongly influenced by passenger behaviour during the voyage and at tourism sites. In contrast, relatively limited scholarly attention has been devoted to passenger education and behavioural dimensions, particularly within yacht operations where direct interaction between crew and passengers is frequent and influential. This indicates a need for a more practical educational approach that can translate sustainability principles into simple onboard messages and daily operational practices.

This article addresses this gap by proposing a simple, practice-oriented educational model grounded in practitioner experience [7]. The model emphasises three interconnected components: pre-sail briefing, onboard informal education, and leadership by example from yacht captains and crew. Through short environmental messages before departure, repeated reminders during activities, and visible responsible behaviour by crew members, passengers can be encouraged to act more carefully in marine environments. The primary objective of this study is to conceptually develop an educational approach that can be implemented by yacht captains and crews to enhance passenger awareness and encourage environmentally responsible behaviour during marine tourism activities. In doing so, this article contributes to the broader discussion of sustainable maritime tourism by highlighting the importance of human behaviour, environmental communication, and crew-led education as complementary elements to technological and managerial sustainability strategies.

2. Materials and Methods

This study adopts a qualitative experiential case study design, employing participatory observation as its principal methodological approach [8]. This design was considered appropriate because the study seeks to understand environmental education practices within their real operational context rather than to measure passenger behaviour through controlled experimentation. The case context comprises yacht tourism operations in Banyuwangi, Indonesia, where tourism activities take place in marine areas with ecological sensitivity and growing visitor pressure. The author acted as a participant observer through his professional role as a yacht captain over an approximate two-year period. This position enabled direct engagement with daily yacht operations, passenger interactions, crew practices, and environmental issues occurring before, during, and after marine tourism activities.

Participatory observation was selected due to its suitability for capturing real-time passenger behaviour and operational constraints that are often difficult to access through survey-based or experimental methods [9]. In yacht tourism operations, many environmentally relevant behaviours occur spontaneously and may not be fully reported by passengers in questionnaires or interviews. Therefore, direct observation allowed the researcher to identify practical issues such as passenger responses to environmental instructions, tendencies to litter, curiosity toward coral and marine organisms, and the effectiveness of reminders delivered by crew members. Data were derived from continuous onboard observation, informal interactions with passengers and crew members, and reflective field notes concerning recurrent environmental issues encountered during yacht tours. These

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observations were not limited to passenger behaviour, but also included crew communication practices, timing of safety and environmental messages, and operational conditions that influenced the delivery of environmental education.

The analytical process involved the systematic identification of behavioural patterns [10] that posed potential risks to the marine environment. Observed behaviours were reviewed repeatedly to identify recurring themes, particularly those related to waste handling, interaction with coral reefs, disturbance of marine organisms, and passenger compliance with onboard instructions. These patterns were then interpreted in relation to the practical responsibilities of yacht captains and crew members in guiding passenger conduct during maritime tourism activities. Based on this analysis, the study developed a feasible educational intervention that could be integrated into standard yacht operating procedures without requiring complex equipment, additional infrastructure, or lengthy formal training sessions.

The conceptual development process focused on producing a simple and operationally applicable model for environmental education in yacht tourism. The resulting approach emphasises short pre-sail briefings, informal onboard education, activity-based reminders, and leadership by example from yacht crews. This method reflects the realities of small-scale maritime tourism, where time, passenger attention, and operational flexibility are limited. Ethical approval was not required for this study, as no formal research instruments involving human subjects were employed. The study did not collect personal data, conduct structured interviews, or apply experimental interventions to participants. Instead, it relied on professional experience, routine operational observation, and reflective interpretation of recurring environmental challenges encountered in yacht tourism practice.

3. Results

The results presented in this section constitute observational insights and conceptual outcomes derived from participatory observation, rather than empirical measurement or statistical hypothesis testing. The findings emerged from repeated observations conducted during yacht tourism operations in Banyuwangi over an approximate two-year period. Throughout these operations, passenger behaviour, crew-passenger interactions, and environmental communication practices were systematically reflected upon to identify recurring environmental challenges and opportunities for behavioural intervention.

Across multiple yacht tours, passengers frequently displayed limited awareness of the fragility of marine ecosystems. Such limitations were manifested through behaviours including the disposal of small waste items overboard, physical contact with coral reefs during snorkeling activities, and attempts to interact directly with marine fauna. Although these actions were generally unintentional and motivated by curiosity rather than negligence, they nevertheless represented potential threats to ecosystem integrity. These observations are consistent with previous studies indicating that tourist activities can generate cumulative pressures on marine and coastal ecosystems when environmental awareness and behavioural control are insufficient [1], [9]. The findings suggest that many passengers possessed limited prior knowledge regarding marine conservation principles and the ecological consequences of seemingly minor actions.

In addition, environmental messages delivered during tourism activities were often informal, inconsistent, and highly dependent on individual crew members. While safety briefings were routinely conducted before departure, environmental guidance frequently received less emphasis despite its relevance to sustainable tourism management. This observation highlights a practical gap between sustainability objectives and day-to-day tourism operations. Existing studies on sustainable maritime tourism have emphasized environmental responsibility and sustainability-oriented practices as essential elements for minimizing tourism impacts on sensitive marine environments [1], [2]. Consequently, there is a need for a simple educational mechanism that can be integrated into routine yacht activities without imposing additional operational burdens on captains or crew members.

In response to these recurring observations, a simple educational intervention designated as the 5-Minute Pre-Sail Briefing Model was

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developed. The model is designed as a practical and low-cost approach to environmental education that can be incorporated into existing operational procedures. Rather than relying on formal training sessions or specialized educational materials, the model utilizes direct communication, repeated reminders, and behavioural demonstration by crew members to promote environmental awareness among passengers. This approach is aligned with practically oriented educational methods that emphasize direct application, contextual learning, and behavioural reinforcement in real operational environments [7].

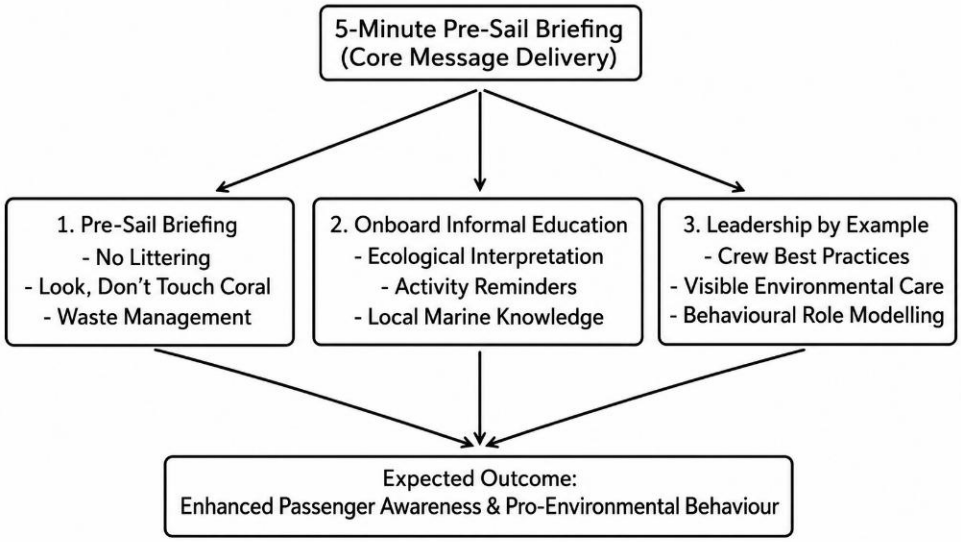

Figure 1. Conceptual framework of the 5-Minute Pre-Sail Briefing educational model for yacht passengers.

Figure 1 illustrates the three integrated components of the 5-Minute Pre-Sail Briefing model: pre-departure briefing, onboard informal education, and leadership by example. These components operate sequentially and reinforce one another throughout the tourism experience. The model positions yacht captains and crews as sustainability communicators who play a central role in influencing passenger attitudes and behaviours. Through the integration of communication, experiential learning, and behavioural reinforcement, the framework seeks to enhance passenger awareness and encourage environmentally responsible conduct during marine tourism activities [3], [7].

3.1. Pre-Sail Briefing

The first component of the model consists of a structured and concise environmental briefing delivered prior to departure. This briefing is designed to complement existing safety briefings and requires approximately five minutes to complete. The objective is not to provide detailed environmental training but rather to communicate a limited number of essential messages that are easy to remember and apply during the voyage.

Key topics include waste prevention, coral reef protection, and onboard waste management procedures. Passengers are reminded not to throw any waste into the sea, regardless of its size or biodegradability. Particular emphasis is placed on the ecological vulnerability of coral reefs, including simple instructions such as “look but do not touch” and “maintain buoyancy awareness during snorkeling activities.” In addition, passengers are informed about designated waste disposal facilities available on board and encouraged to actively participate in maintaining vessel cleanliness.

Environmental education studies indicate that brief but targeted educational interventions can positively influence environmental knowledge, attitudes, and behaviour when delivered at appropriate moments [3]. Observational experience suggests that passengers generally respond positively to practical instructions delivered before activities begin. A concise briefing provides a common behavioural framework for all passengers and establishes environmental responsibility as an expected component of the tourism experience.

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Furthermore, delivering these messages before departure ensures that environmental considerations are introduced proactively rather than reactively after undesirable behaviours have already occurred.

3.2. Onboard Informal Education

The second component consists of informal educational interactions conducted throughout the voyage. Unlike the pre-sail briefing, which is delivered at a specific point in time, onboard informal education occurs continuously and adapts to the operational context. This approach recognizes that passengers often learn more effectively when information is connected directly to their immediate experiences and surroundings.

Examples of onboard informal education include ecological interpretation of nearby coastal features, explanations regarding coral reef functions, discussions about local marine biodiversity, and reminders concerning environmentally responsible conduct before snorkeling or swimming activities. These educational interactions are intentionally brief and conversational, allowing them to be incorporated naturally into routine crew-passenger communication.

The ecological context of Banyuwangi and its connection to environmentally sensitive areas such as Alas Purwo National Park provide valuable opportunities for experiential environmental learning [4]. Observations indicate that passengers often show strong curiosity regarding marine environments when information is presented in an accessible and engaging manner. Simple explanations about the ecological importance of coral reefs, fish habitats, or marine protected areas can increase appreciation of environmental values and strengthen motivation for responsible behaviour. Repeated reminders delivered immediately before activities also help reinforce key conservation messages and reduce the likelihood of environmentally harmful actions.

This component therefore serves as a mechanism for transforming environmental education from a single event into an ongoing learning process. By continuously connecting tourism experiences with ecological understanding, onboard informal education contributes to the development of environmental awareness throughout the duration of the voyage.

3.3. Leadership by Example

The third component of the model is leadership by example, which emphasizes the role of yacht captains and crew members as behavioural role models. Environmental messages may be less effective if they are not supported by visible actions from those responsible for vessel operations. Consequently, the credibility of environmental education depends not only on what crew members communicate but also on how they behave.

Examples of leadership by example include proper waste segregation practices, active participation in maintaining vessel cleanliness, avoidance of environmentally harmful actions, and respectful interactions with marine ecosystems. Crew members who consistently demonstrate responsible environmental behaviour reinforce educational messages through direct observation. Passengers are therefore exposed to practical examples of how environmental responsibility can be translated into everyday actions.

Practically oriented educational approaches emphasize that behavioural learning is strengthened when learners observe and imitate actions demonstrated within real operational settings [7]. This perspective is particularly relevant in yacht tourism, where captains and crew members occupy positions of trust and authority. Their actions therefore possess substantial educational value beyond formal instruction alone.

Observational evidence from yacht operations suggests that passengers tend to imitate behaviours that are consistently demonstrated by crew members. When environmental responsibility becomes visibly embedded within daily operational practices, passengers are more likely to perceive sustainable behaviour as a normal and expected part of the tourism experience. As a result, leadership by example functions as a critical reinforcing mechanism that strengthens both the pre-sail briefing and onboard educational components.

Overall, the proposed 5-Minute Pre-Sail Briefing Model demonstrates how simple educational interventions can be integrated into yacht tourism operations to support sustainable maritime tourism. While the framework remains

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conceptual and requires future empirical validation, it offers a practical foundation for enhancing passenger awareness and promoting pro-environmental behaviour in marine tourism settings. The model complements existing sustainability initiatives in maritime tourism by addressing the often-overlooked behavioural dimensions of environmental management [1], [2], [9].

4. Discussion

The proposed educational model is consistent with established perspectives in ecotourism education and pro-environmental behaviour theory, both of which emphasise the effectiveness of concise, context-specific communication delivered by trusted and authoritative actors [11]. In maritime tourism, environmental messages are more likely to be accepted when they are communicated directly within the activity setting, particularly before passengers interact with sensitive marine ecosystems. Within yacht operations, the captain and crew occupy positions of institutional authority, thereby enhancing message credibility and increasing the likelihood of passenger compliance.

The model also expands the functional role of yacht crews from operational service providers to environmental communicators. In conventional yacht tourism, captains and crew members are primarily responsible for navigation, safety, passenger comfort, and operational coordination. However, this study suggests that they can also serve as frontline educators who translate sustainability principles into simple behavioural instructions. This is important because many environmentally harmful actions during marine tourism are not necessarily intentional, but occur due to limited awareness, inadequate guidance, or the absence of clear behavioural expectations.

Rather than asserting universal applicability, this study advances the notion of potential transferability of the model to comparable small-scale maritime tourism settings that share similar operational characteristics, including limited passenger numbers, close crew–passenger interaction, and ecologically sensitive destinations [12]. These characteristics create favourable conditions for direct communication, repeated reminders, and behavioural role modelling. Therefore, the model may be relevant not only for yacht operations, but also for small tourist boats, island-hopping vessels, snorkeling boats, diving vessels, and other forms of nature-based maritime tourism.

A key strength of the model lies in its operational simplicity and minimal resource requirements, enabling implementation without significant financial or infrastructural investment. The 5-Minute Pre-Sail Briefing does not require advanced technology, printed educational materials, or additional personnel. Instead, it relies on structured communication, crew commitment, and consistent behavioural reinforcement. This makes the model particularly suitable for small-scale operators that may have limited financial capacity but still face increasing expectations to support sustainable tourism practices.

The model further complements existing sustainability strategies in maritime tourism. Previous studies on sustainable maritime transport and tourism often emphasise engineering solutions, green logistics, fuel efficiency, emission reduction technologies, and environmental management systems [5], [6]. While these approaches are essential, they do not fully address passenger behaviour during direct interaction with marine environments. The proposed model contributes to this gap by highlighting the behavioural and educational dimensions of sustainability. In this sense, environmental education should not be viewed as separate from operational management, but as an integral part of responsible yacht tourism practice.

Several limitations should be acknowledged. First, the study relies on practitioner-based observation, which may introduce interpretive subjectivity. The author's role as a yacht captain provided direct access to operational realities, but it may also influence how passenger behaviour and environmental challenges were interpreted. Second, the absence of formal surveys or quantitative behavioural indicators precludes empirical evaluation of effectiveness. As a result, the study cannot statistically determine whether the proposed model significantly changes passenger behaviour. Third, the focus on a single geographic and operational context limits generalisability. The environmental, cultural, and operational conditions in Banyuwangi may differ from other

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maritime tourism destinations.

Future research should seek to empirically test the model through mixed-method designs, incorporating behavioural surveys, passenger interviews, crew evaluations, and longitudinal ecological monitoring. Experimental or quasi-experimental designs may also be used to compare passenger behaviour before and after the implementation of the 5-Minute Pre-Sail Briefing. In addition, future studies could examine how different message formats, languages, visual aids, and crew communication styles influence passenger compliance. Such research would provide stronger evidence regarding the effectiveness, adaptability, and scalability of the proposed model in broader maritime tourism contexts.

Overall, the discussion indicates that the 5-Minute Pre-Sail Briefing Model offers a practical contribution to sustainable maritime tourism by positioning yacht captains and crews as active agents of environmental education. Although the model remains conceptual and experience-based, it provides a feasible starting point for integrating behavioural change strategies into small-scale yacht tourism operations.

5. Conclusions

This article presents a conceptual and experiential educational model designed to enhance marine environmental sustainability in yacht tourism operations. The proposed 5-Minute Pre-Sail Briefing model demonstrates how yacht captains and crews can serve as frontline sustainability communicators by integrating brief, targeted, and practical environmental messages into routine tourism activities.

The model consists of three main components: pre-sail briefing, onboard informal education, and leadership by example. Together, these components provide a simple mechanism for improving passenger awareness, reducing environmentally harmful behaviour, and promoting responsible interaction with sensitive marine ecosystems.

Although exploratory in nature, this study highlights the importance of behavioural and educational strategies as complements to technological and managerial approaches in sustainable maritime tourism. Wider adoption of such practices, supported by future empirical research, may contribute to more responsible, environmentally conscious, and sustainable maritime tourism development.

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