

CHAPTER I

PREFACE

1.1. Research Background

Mangrove is an important plant species within the coastal ecosystem that plays a vital role in maintaining the environmental balance, starting from preventing sea water intrusion, reducing the impact of winds and waves, to even serving as natural barriers against coastal erosion, tsunamis, and storms (Romimohtarto et al., 2011). However, over the past few decades, mangrove areas in Indonesia have experienced a significant decline in size. To reduce the degradation rate of mangroves, the Indonesian government, through the Ministry of Environment and Forestry (KLHK) and the Ministry of Marine Affairs and Fisheries (KKP), has implemented various conservation and restoration initiatives. One of the notable approaches integrates conservation efforts with edutourism, by utilizing mangrove areas as both tourist destinations and environmental learning media.

As one of the most popular forms of edutourism in Indonesia, mangrove tourism has become increasingly widespread. Globally, mangrove ecosystems cover approximately 14.8 million hectares, highlighting the significance of mangrove-based tourism as a key component of the ecotourism sector (FAO, 2020). Despite this potential, many mangroves tourism in Indonesia remain focused solely on recreational purposes rather than educational engagements. For instance, a study done by Verawati and Idrus (2023) in Gili Sulat found that visitors' enthusiasm for learning was not adequately supported by the availability of educational facilities, such as the absence of educational boards and other interpretative materials. As a result, the learning potential of mangrove ecotourism remains largely untapped, resulting in a less meaningful and impactful experience for the visitors.

To illustrate the local development of mangrove-based ecotourism in Indonesia, Lembur Mangrove Patikang serves as a notable example. Located in Citereup Village, Panimbang District, Pandeglang Regency, this ecotourism covers

the area of approximately 4 hectares and serves as the main source of mangrove seedlings in Pandeglang area. The site holds significant potential due to its rich biodiversity, including a wide variety of flora and fauna that serves as the core attraction of the ecotourism experience. One of the main selling points is the diverse bird species that allow visitors to participate in birdwatching activities, supported by the presence of a *gardu pandang* (bird-watching tower), promoting both conservation and visitor engagement. However, a study by Widayanti (2023) found that the site's sustainability status falls under the category of "less sustainable", with an average index score of 39.02, indicating that the edutourism potential has not yet been fully optimized.

Until this point of time, the tourism activities in Lembur Mangrove Patikang are primarily focused on recreation, while its educational function has not been fully optimized. Based on recent field observation, the informational and educational media related to edutourism presented are very little to none, limiting visitors' opportunities to gain meaningful learning experiences. Moreover, the lack of visual interpretation and interactive communication media further contributes to the lack of lasting educational impressions. There is a need for educational signages that can inform visitors about the tourism facilities and biodiversity within the Lembur Mangrove area, while the existing signages only indicate certain locations, whose interactivity has yet to be experienced by visitors.

As an effort to sustain and further develop edutourism within the Lembur Mangrove Patikang area, the birdwatching tower (*gardu pandang*) revitalization project will be conducted within the PKM (*Pemberdayaan Kemitraan Masyarakat*) program, collaborating with the local tourism awareness group (*Kelompok Sadar Wisata*), led by Deden Sudiana. This program does not only focus on infrastructure renovation but also aims to enhance edutourism development through the installation of interactive educational media at the birdwatching tower area. By introducing this interactive media, visitors are expected to not only gain observational experiences but are also provided with access to educational materials related to the mangrove ecosystem and local fauna available through engaging and

immersive media. Hence why the presence of informative tourism is needed to create a more interactive and memorable tourism experience. Therefore, this study aims to examine how the birdwatching educational design media can enhance the quality of educational tourism experiences and encourage greater user engagement.

1.2. Problem Formulation

Based on the Research Background stated above, the research problems can be formulated as follows:

1. The absence of informative and interactive media regarding the biodiversity of the mangrove area, resulting in the underutilization of edutourism potential.
2. The low level of educational experience gained by visitors due to limited visual media and the lack of engaging communication media.
3. The effectiveness of interactive signage as an informational and educational medium in improving the quality of edutourism experiences at Lembur Mangrove Patikang has not been scientifically proven.

Based on the problems identified above, the research objective of this study is to examine how interactivity in birdwatching media at Lembur Mangrove Patikang influences user engagement and visitors' educational tourism experiences.

1.3. Research Limitations and Scope

Based on the research background and problems identified above, the research limitations can be formulated as follows:

1. Research Object

The object of this research is the content and media design of the interactive birdwatching guidebook in Lembur Mangrove Patikang, Citereup Village, Panimbang District, Pandeglang Regency. The research focuses mainly on the media elements displayed within the birdwatching tower, which are designed to reflect the biodiversity present in the area, and

to evaluate the level of user engagement stimulated through interaction with the media.

2. Research Subjects

Based on the research problems and objects, the research subjects can be formulated as follows:

a. Demographic

- Age : 20-30 years old
- Education : minimum high school graduate
- Gender : male and female
- Occupation : university students and private employees (*pegawai swasta*)
- Economic status : SES B (middle class) with the income range of IDR 4,000,000-6,000,000 per month (Dihni, 2022)

b. Geographic

- Jabodetabek, Indonesia

c. Psychographic

- Environmentally conscious individuals with a high level of curiosity.
- Tend to have interest in nature and environment related tourism, seeking both relaxation and educational value from nature-based tourism.
- Individuals who appreciate meaningful travel experiences that go beyond entertainment and provide new insights or knowledge.
- Prefer affordable, family-friendly, and sustainable tourism concepts.

1.4. Research Purpose

Based on the research background, problems, and scope described above, the purpose of this Research and Technology Program is to analyze the user engagement of the interactive educational media developed for Lembur Mangrove Patikang, with the target audience focusing on young adult tourists, particularly university students and private-sector employees aged 20-30 years old. The objective of this study is to evaluate the effectiveness of interactive educational media and content that will be implemented at Lembur Mangrove Patikang in enhancing visitors' educational tourism experiences.

1.5. Research Urgency

Based on the research background, problems, and scope described above, the urgency of this Research and Technology Program lies in the need to introduce a more interactive edutourism approach to mangrove ecotourism development, particularly through birdwatching activities at *Lembur Mangrove Patikang*. This research seeks to determine the extent to which interactive educational media design can support the educational function of mangrove ecotourism, which has so far been underutilized and focused primarily on recreation. The urgency of this research is supported by Ham (2016), who emphasized that educational experiences in ecotourism can only be optimized through appropriate interpretive media. Therefore, this study does not merely focus on design engineering aspects but also evaluates the effectiveness of media interactivity in providing meaningful edutourism experiences.

1.6. Research Outputs

The PRO-STEP Research and Technology Program will produce several key outcomes. First, physical outputs in the form of interactive birdwatching educational media that are installed at the birdwatching tower and throughout the Lembur Mangrove Patikang ecotourism area. Second, scientific output in the form of research report entitled *User Engagement Analysis of Interactive Birdwatching Signage at Lembur Mangrove Patikang*. Lastly, an Intellectual Property output in

the form of Intellectual Property Rights, the registration of copyright for the design and content of the interactive birdwatching media as legal protection for the creative output generated through this program.

1.7. Research Benefits

Based on the research background, problems, and scopes identified above, the research limitations can be formulated as follows:

a) For the Researcher

Through the PRO-STEP Research and Technology Program, researcher will have the chance to enhance their knowledge and skills in designing and analyzing interactive educational media, particularly edutourism-oriented media in mangrove ecotourism areas. The program also provides hands-on experience in field research, cross-sector collaboration, and the practical application of technology to support sustainable ecotourism development.

b) For Future Researchers

The findings of this program can serve as valuable data for future studies, especially those focusing on the interactivity of informative-educational media in the context of mangrove tourism. The results of this study may provide a foundation for more comprehensive and in-depth research in the future.

c) For the Local Community

The program is expected to enhance the tourism appeal of Lembur Mangrove Patikang, which may not only increase visitor numbers but also to open up economic opportunities for the local community. Socially, the program contributes to raising public awareness of the biodiversity and wildlife in the area, fostering local pride and motivating stronger commitment to environmental conservation.

d) For the University

The program contributes to strengthening the university's role in research and community service, reinforcing its credibility as an institution that promotes innovation through applied research. The outcomes are also expected to increase the chances for more broader collaborations with local governments, conservation organizations, and the tourism sector.

1.8. Research Timeline

The timeline of the PRO-STEP Research and Technology program can be formulated as follows:

Table 1.1 Timeline of PRO-STEP Research and Technology Program

NO	DATES	ACTIVITIES
1	August 8th 2025	PRO-STEP socialization
2	Agustus 11-12th 2025	KRS
4	Agustus 18-22nd 2025	PRO-STEP registration period
5	August 25th 2025	Start of PRO-STEP
6	August 25th – October 3rd 2025	Counseling period phase 1
7	October 6 – 10th 2025	Evaluation 1 of PRO-STEP Research and Technology Program

8	October 13 – 24th 2025	UTS (Ujian tengah Semester)
9	October 13th – November 28th 2025	Counseling period phase 2
10	Desember 1st – 3rd 2025	Evaluation 2 of PRO-STEP Research and Technology Program
11	December 11th 2025	Document completeness verification for PRO-STEP Research and Technology Program evaluation session
12	December 12th 2025	Registration Deadline for PRO-STEP Research and Technology evaluation session
13	December 15th 2025	PRO-STEP Research and Technology Program evaluation session
14	December 15th 2025 – January 3rd 2026	UAS (Ujian Akhir Semester)
15	December 22nd 2025	Revision and final approval of the PRO-STEP Research and Technology Program final report / submission to the PRO-STEP website