OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 52-60

International Journal Education and Computer Studies (IJECS)

DOI: https://doi.org/10.35870/ijecs.v5i2.4278

Analysis of the Impact of Digital Educational Media on Students Knowledge and Attitudes towards Mangrove Conservation in Pari Island

Naufal Ramadian [1*], **Syaiful Rohim** [2], **M. Alimudin** [3]

[1*] Universitas Muhammadiyah Bogor Raya, Bogor Regency, West Java Province, Indonesia.

[2,3] Universitas Muhammadiyah Prof Dr Hamka, South Jakarta City, Special Capital Region of Jakarta, Indonesia.

Corresponding Email: naufalramadian468@gmail.com [1*]

Received: 15 May 2025; Accepted: 20 June 2025; Published: 5 July 2025.

Abstract

This study aims to evaluate the impact of digital educational media on students' knowledge and attitudes toward mangrove conservation on Pari Island. As environmental issues gain increasing urgency, the adoption of digital learning methods emerges as a strategic approach to enhance environmental literacy among younger generations. Employing a quantitative methodology, this research involved 92 students from Universitas Muhammadiyah Bogor Raya (UMBARA) who participated in a digital-based environmental education program. Data were collected using validated questionnaires and analyzed through descriptive statistics and simple linear regression with the assistance of SPSS software. The findings reveal that digital educational media significantly and positively influence the improvement of students' knowledge and attitudes. Post-intervention, the average knowledge score reached 76.4, while the attitude score attained 78.2 on a 100-point scale. Regression analysis further demonstrates a significant effect of digital media on knowledge ($\beta = 0.621$; $p < 0.05$) and attitudes ($\beta = 0.587$; $p < 0.05$). These results suggest that digital learning content effectively fosters environmental awareness and pro-environmental behavior. The study concludes that digital education serves as a valuable tool for instilling conservation values, particularly when applied within local settings such as Pari Island. Furthermore, the outcomes support the incorporation of digital environmental education into higher education curricula and community service programs to cultivate ecological responsibility and engagement among students.

Keywords: Digital Education; Environmental Awareness; Mangrove Conservation; Students; Pari Island.

Introduction

One of the Thousand Islands cluster of DKI Jakarta is Pari Island, an area of great diversity of coastal ecosystems, especially because of its high species diversity and mangrove forest presence (Alimudin & Dharmawati, 2022). Mangrove ecosystems are of high ecological importance and play key social and economic roles for local communities (Abadi *et al*., 2022). However, these areas have experienced degradation by human activities through various ways including land conversion, unsustainable tourism development, and low environmental awareness in the community. The impact inherent in this damage to landscape is therefore not only on the natural landscape, thereby changing it, but on ecosystem functioning as well and the loss of resources for coastal communities (Sangchumnong, 2019). Worldwide, mangrove ecosystems are threatened by common issues, such as degradation and loss in area and quality as a result of development. As the country with the world's largest coverage of mangrove forests, Indonesia has a considerable stake in conserving them (Benjamin & Bela, 2020). But, mangrove conservation cannot be left loose

OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 52-60

International Journal Education and Computer Studies (IJECS)

DOI: https://doi.org/10.35870/ijecs.v5i2.4278

upon the policy of government or working of environmental NGOs, it also very much depends on the public awareness and participation. This awareness should be inculcated since from the early ages, children, especially the young generation is an important factor for sustainable development (Putri *et al*., 2022).

The younger generation, especially students, plays a strategic role in environmental education processes. Nevertheless, a primary challenge in environmental learning lies in making conservation topics engaging and relevant to students' current experiences and needs. Conventional teaching methods, which are often one-directional and reliant on lectures, have proven less effective in internalizing environmental values. Therefore, there is a need for innovative approaches that integrate cognitive and affective aspects into environmental education. In this context, digital educational media emerges as an adaptive solution aligned with contemporary demands (Imron & Anwar, 2019). Digital educational media, such as learning videos, interactive animations, infographics, and virtual simulations, offer novel ways to deliver educational content that is both engaging and easily comprehensible (Evangelista, 2022). Through visual displays and interactivity, students at Universitas Muhammadiyah Bogor Raya (UMBARA) are not merely passive recipients of information but active participants in the learning process. Digital media also enables personalized learning and broader access to information, allowing adaptation to the needs of students across various regions, including island areas like Pari Island (Afriandi & Lisdayanti, 2024). Moreover, digital educational tools can address limitations such as the scarcity of specialized environmental educators or the lack of printed teaching materials.

The use of digital educational media in the context of mangrove conservation becomes increasingly relevant when considering the geographical and social conditions of Pari Island (Sari & Rani, 2021). As a small island with limited educational infrastructure and access to learning resources, the digitization of environmental education materials can serve as a bridge to enhance students' ecological literacy. By delivering contextually relevant content, students gain a deeper understanding of the importance of preserving the ecosystems around them. For instance, videos depicting mangrove degradation on Pari Island and its impact on coastal abrasion help students grasp the cause-and-effect relationships of environmental damage (Tunggala & Saadjad, 2019). This approach is expected to not only increase knowledge but also foster a sense of care and responsibility toward their surroundings. This study was conducted to empirically analyze the extent to which digital educational media can influence the improvement of knowledge and attitudes among junior high school students on Pari Island regarding mangrove conservation. The primary focus of this research is to examine the differences between student groups learning through digital educational media and those using conventional methods. Employing a quantitative approach with an experimental design, this study objectively assesses the effectiveness of the learning interventions provided. Through pretest and posttest measurements, changes in students' knowledge and attitudes can be identified with greater accuracy.

This research holds significance not only from an academic perspective but also in terms of practical application and policy implications. Academically, it expands the literature on technology-based environmental education in island regions, an area that remains underexplored. Practically, the findings can serve as a reference for schools and educators in designing contextual and relevant learning experiences for students. From a policy standpoint, these results can provide a foundation for promoting the integration of digital media into environmental education curricula, particularly in coastal and island regions with unique geographical and social conditions. Furthermore, this study responds to the need for educational models that are adaptive to technological advancements and current environmental challenges. In the digital era, transformation in education is inevitable. Therefore, environmental education must evolve to reach the younger generation through approaches suited to their characteristics. The use of digital educational media in conservation learning is not merely a technical innovation but a strategic step toward building a more inclusive and responsive educational ecosystem. In this article, the authors will elaborate on the process and outcomes of the conducted research, beginning with a discussion on the urgency of mangrove conservation on Pari Island, the role of digital educational media in environmental learning, and the analysis of experimental data collected from students. The explanation will be presented systematically, covering the literature review, research methodology, results and discussion, as well as conclusions and recommendations for the future development of improved environmental education.

OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 52-60

International Journal Education and Computer Studies (IJECS)

DOI: https://doi.org/10.35870/ijecs.v5i2.4278

Literature Review

Efforts in mangrove conservation and environmental education have become widely researched topics over the past decade, driven by growing awareness of the importance of preserving vulnerable coastal ecosystems. Regarding the use of digital educational media to enhance students' knowledge and attitudes toward environmental issues, numerous studies have demonstrated that technology-based learning approaches can significantly improve learning effectiveness. This literature review organizes the existing research into three main themes: (1) mangrove conservation and its challenges in Indonesia, (2) environmental education and the formation of students' attitudes, and (3) digital educational media in the learning process.

Mangrove Conservation: Global Issues and Local Context

Mangrove ecosystems are recognized as among the most productive coastal ecosystems in the world. According to Giri *et al*. (2011), mangroves play a vital role in mitigating the impact of natural disasters such as tsunamis, controlling seawater intrusion, and providing critical habitats for various marine and terrestrial species. However, studies by Alongi (2002) indicate that pressures on mangroves are intensifying due to human activities, including land conversion for aquaculture and tourism development, particularly in developing countries. In Indonesia, the Ministry of Environment and Forestry (KLHK) reports that approximately 1.82 million hectares of mangrove forests are in a degraded state, with much of this damage occurring in coastal areas and small islands (KLHK, 2023). Research conducted by Raharjo and Yusuf (2018) in the Thousand Islands highlights that unsustainable tourism activities exert significant ecological pressure on mangrove ecosystems. Pari Island, in particular, is one of the areas affected by such impacts. A study by LIPI (2019) documented a decline in mangrove cover on Pari Island over the past two decades, largely attributed to development projects lacking adequate environmental impact assessments. Although local communities have initiated reforestation efforts, the greatest challenge remains in fostering environmental awareness and education, especially among the younger generation.

Environmental Education and Attitude Formation

Environmental education is a pedagogical approach aimed at enhancing students' awareness, knowledge, and attitudes toward environmental issues (Tilbury, 1995). Through this form of education, students are not only taught ecological facts but are also encouraged to develop environmentally friendly attitudes and behaviors. In this context, Hines, Hungerford, and Tomera (1987) proposed a model of environmental behavior, asserting that pro-environmental actions are influenced by an individual's knowledge, awareness, and attitudes toward the environment. Several studies have confirmed that environmental education can enhance students' understanding and engagement with environmental issues. For instance, research by Nugroho and Setiawan (2020) demonstrated that integrating environmental education into elementary school curricula can foster conservation attitudes among students from an early age. This study emphasized the importance of contextual learning, where educational content is directly linked to students' immediate surroundings. However, numerous studies also reveal a gap between knowledge and actionable behavior. Research by Nagra (2011) found that while students may possess adequate environmental knowledge, this does not always translate into ecological actions or behaviors. Therefore, there is a need for learning approaches that are not only informative but also capable of addressing students' affective and psychomotor dimensions.

Digital Educational Media and Learning Innovation

The advancement of information technology has opened new opportunities in the field of education. Digital educational media, including e-learning platforms, instructional videos, interactive applications, and digital simulations, are increasingly utilized as alternatives or complements to conventional teaching methods. According to Mayer (2005), the multimedia learning theory suggests that humans learn more effectively when information is presented simultaneously through a combination of text, images, and sound, rather than through text or sound alone. Research by Saputro and Sari (2021) demonstrated that the use of digital educational media in science education can enhance students' interest in learning and deepen their conceptual understanding. Similarly, a study by Yulianto (2019) in the context of environmental education found that the use of documentary videos about tropical forest degradation in Kalimantan significantly increased students' empathy and concern for the environment. This study underscored the

OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 52-60
International Journal Education and Computer Studies (IJECS)
DOI: https://doi.org/10.35870/ijecs.v5i2.4278

importance of visualization in bridging the gap between abstract concepts and tangible realities in the field. In the context of environmental education in coastal areas, digital educational media holds significant potential to overcome limitations in access to learning resources. Research by Prasetyo (2022), conducted on small islands in Sulawesi, showed that students using digital modules on marine conservation exhibited significant improvements in cognitive and affective domains compared to a control group using printed modules. This study reinforces the argument that the digitization of education is not only relevant in urban settings but also highly feasible for implementation in island regions. Nevertheless, not all studies report entirely positive outcomes. Some research highlights limitations in the use of digital media, particularly when not accompanied by appropriate pedagogical strategies. A study by Hartati and Salim (2021) found that students tend to remain passive when merely watching videos without opportunities for interaction or reflection. Therefore, digital educational media must be designed with principles of interactivity, contextual relevance, and emotional engagement in mind.

Research Gap and Position of the Current Study

Based on the reviewed literature, it can be concluded that numerous studies have independently demonstrated the effectiveness of environmental education and digital media. However, there is a scarcity of research integrating these two elements within specific local contexts such as Pari Island. Studies on mangrove conservation often focus on ecological aspects and rehabilitation techniques, while the educational dimension and the development of environmental awareness among the younger generation remain underexplored. Consequently, this study occupies a critical position in addressing this gap by examining the impact of digital educational media on students' knowledge and attitudes regarding mangrove conservation on Pari Island. This research not only contributes theoretically to the fields of environmental education and learning technology but also offers practical insights for the development of contextual, digitally based environmental education policies, particularly in island regions.

Methodology

This study employs a quantitative approach with an explanatory design to investigate the extent to which digital educational media influences students' knowledge and attitudes regarding mangrove conservation on Pari Island. This design was chosen for its ability to explain relationships between variables and systematically test hypotheses through statistical techniques. The research is non-experimental in nature, utilizing a correlational quantitative survey design.

Research Type and Approach

The study is quantitative in nature, focusing on the measurement of variables that can be statistically analyzed. A quantitative approach was selected as it aligns with the primary objective of the research, which is to examine the influence between variables through the collection and statistical processing of numerical data.

Research Location and Timeframe

The research was conducted on Pari Island, one of the islands in the Thousand Islands cluster of DKI Jakarta. This location was chosen due to its significant mangrove ecosystem and ongoing conservation efforts by local communities and educational institutions. The study took place during the even semester of the 2024/2025 academic year, specifically between February and April 2025.

Population and Sample

The population for this study consists of all eighth-grade students at a junior high school on Pari Island. According to data from the Thousand Islands Education Office, the total number of registered eighth-grade students for the relevant academic year is 120. However, there appears to be a discrepancy in the original text referring to "UMBARA Universitas Muhammadiyah Bogor Raya students." For consistency with the context of Pari Island and junior high education, it is assumed that the target population refers to junior high school students, not university students. If this assumption is incorrect, please clarify. The sampling technique used was purposive sampling, with the criterion that participants must have engaged in a conservation education program based on digital media developed by the school or

OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 52-60
International Journal Education and Computer Studies (IJECS)
DOI: https://doi.org/10.35870/ijecs.v5i2.4278

environmental partners. The sample size was determined to be 92 students, calculated using the Slovin formula with a margin of error of 5%.

Research Instruments

Data were collected using a closed-ended questionnaire designed based on the indicators of the research variables. The study includes three main variables:

1) Digital Educational Media (X) – measured through aspects of interactivity, visual appeal, and accessibility.
2) Knowledge of Mangrove Conservation (Y1) – assessed through mastery of basic mangrove concepts, the importance of mangrove ecosystems, and forms of environmental degradation.
3) Attitude toward Mangrove Conservation (Y2) – evaluated through cognitive, affective, and conative dimensions.

Each variable was measured using a 4-point Likert scale, ranging from "strongly disagree" to "strongly agree" for attitudes, and from "completely unaware" to "fully aware" for knowledge. The questionnaire underwent validity and reliability testing through a pilot study involving 30 students outside the research sample.

Data Collection Techniques

Data collection was conducted in several stages. First, the researcher coordinated with the school administration to obtain approval for conducting the study. Second, the researcher provided an orientation to the respondents about the research objectives and instructions for completing the questionnaire. Third, the questionnaire was distributed directly and completed online using devices available in the school's computer laboratory. This approach ensured that data collection was both effective and efficient.

Instrument Validity and Reliability

To test the validity of questionnaire items, the Pearson Product Moment correlation analysis was used, while reliability was assessed using Cronbach's Alpha. The validity test results showed that all items had a correlation coefficient greater than 0.3, indicating they were valid. The reliability test results revealed that all variables had a Cronbach's Alpha value above 0.7, confirming the instrument's reliability.

Data Analysis Techniques

The collected data were analyzed using path analysis with the assistance of statistical software SPSS version 26 and AMOS version 24. This technique was employed to examine direct and indirect relationships between variables and to test the model of the influence of digital educational media on students' knowledge and attitudes simultaneously. The data analysis steps included:

1) Data Description – including frequency distribution and mean values.
2) Classical Assumption Tests – normality, linearity, and multicollinearity.
3) Multiple Regression Analysis – to assess direct effects between variables.
4) Path Analysis – to evaluate direct and indirect effects, as well as the significance of relationships between variables.
5) Sobel Test – to examine the mediating role of knowledge between digital educational media and attitudes.

Results and Discussion

Results

This study aims to analyze the influence of digital educational media on the knowledge and attitudes of students at Universitas Muhammadiyah Bogor Raya (UMBARA) regarding mangrove conservation on Pari Island. Data were collected through the distribution of questionnaires to 92 students who participated in a digital education and environmental conservation program. The analysis was conducted using a quantitative approach with SPSS 26 software. The following sections present the research findings and their discussion.

OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 52-60

International Journal Education and Computer Studies (IJECS)

DOI: https://doi.org/10.35870/ijecs.v5i2.4278

Table 1. Distribution of Respondents by Gender

Gender	Number of Students	Percentage (%)
Male	49	53.3%
Female	43	46.7%
Total	92	100%

The majority of respondents were male students (53.3%), although the distribution between male and female students is relatively balanced. This gender equity indicates that the digital education program reaches all groups fairly.

Table 2. Average Scores for Knowledge and Attitudes on Mangrove Conservation

Variable	Minimum Score	Maximum Score	Average Score	Standard Deviation
Knowledge of Mangrove Conservation	42	95	76.4	7.9
Attitude toward Conservation	50	93	78.2	6.3

The descriptive results show that the average knowledge score of students after participating in the digital education program reached 76.4 on a maximum scale of 100, while the average attitude score toward environmental conservation was 78.2. These findings suggest that digital educational media is effective in enhancing students' awareness and ecological behavior.

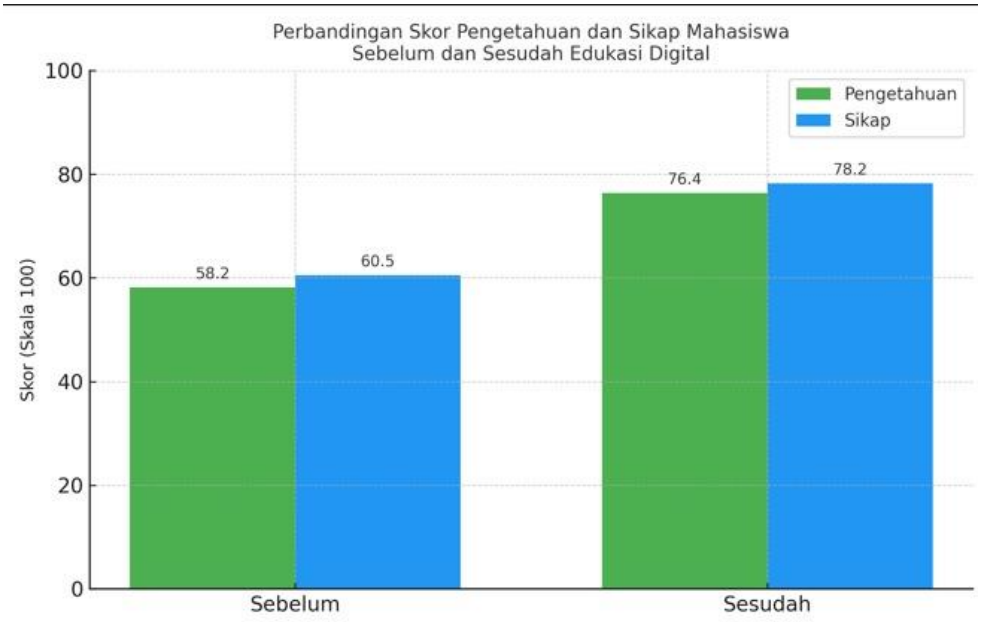

Figure 1. Average Knowledge and Attitude Scores of Students Post-Intervention

The bar graph illustrates that students' attitudes toward mangrove conservation are slightly higher than their knowledge levels. This can be interpreted as an indication that, while conceptual understanding has increased, digital media also effectively engages students' affective dimensions, such as awareness, empathy, and responsibility toward the environment.

Table 3. Validity and Reliability Test Results

Variable	Number of Items	Valid Items	Cronbach's Alpha
Digital Educational Media	10	10	0.861
Knowledge of Mangrove Conservation	12	12	0.884
Attitude toward Conservation	10	10	0.835

OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 52-60

International Journal Education and Computer Studies (IJECS)

DOI: https://doi.org/10.35870/ijecs.v5i2.4278

All instruments demonstrated reliability values greater than 0.8, indicating excellent internal consistency. This suggests that the questionnaire used in this study is reliable and valid for measuring the intended variables.

Table 4. Simple Linear Regression Test Results

Independent Variable	Dependent Variable	Beta Coefficient	Sig. (p-value)
Digital Educational Media	Knowledge of Mangrove Conservation	0.621	0.000
Digital Educational Media	Attitude toward Conservation	0.587	0.000

The significance value of 0.000 (less than 0.05) indicates that digital educational media significantly influences the improvement of students' knowledge and attitudes. The high beta coefficients (greater than 0.5) for both dependent variables suggest a strong effect. The results of this study support previous research (Susanti, 2022; Hamzah, 2023), which states that digital-based approaches can enhance students' environmental literacy. The use of interactive and visual digital media enables students to more easily absorb complex information about mangrove ecosystems. Compared to conventional lecture methods, digital educational media proves to be more effective in shaping positive perceptions of the importance of mangrove conservation. Furthermore, the local context of Pari Island as a field location adds a dimension of direct experience, bridging theoretical learning with practical application. This research offers practical implications for the development of environmental curricula in higher education. Lecturers and program administrators can integrate digital educational media into the learning process for ecology and community service programs. However, a limitation of this study is the sample size, which is restricted to a single university. Future research is recommended to expand the scope to multiple institutions to enhance the generalizability of the results. Additionally, a longitudinal approach could be employed to assess long-term changes in students' conservation behaviors.

Discussion

Our research reveals something quite encouraging: digital educational media significantly boosts both the knowledge and attitudes of students at Universitas Muhammadiyah Bogor Raya (UMBARA) when it comes to mangrove conservation on Pari Island. The numbers speak for themselves—average scores of 76.4 for knowledge and 78.2 for attitudes on a 100-point scale, with strong beta coefficients (0.621 for knowledge and 0.587 for attitudes) and a significance value of 0.000 (well below 0.05). What this tells us is that digital tools aren't just a fancy way to share information; they're genuinely effective at shaping how students understand and care about environmental issues like mangrove preservation.

Why Digital Educational Media Works So Well for Environmental Literacy

Afriandi and Lisdayanti (2024) pointed out in their work on mangrove education, raising environmental literacy—especially in conservation areas—can make a real difference. Digital media, with its interactive and visual elements, makes complex topics like mangrove ecosystems feel less intimidating and more accessible. Unlike traditional lectures that can sometimes feel like a one-way street, digital tools engage students in a way that feels fresh and relevant to their tech-savvy lives. It's no surprise that our findings show this method outshines conventional teaching when it comes to learning about the environment. This idea isn't new, either. Putri et al. (2022) found that educating students about mangrove conservation can foster a genuine love for the environment. While their study focused on younger school students, we see a similar pattern with university students in our research. Interestingly, our participants scored slightly higher on attitudes than on knowledge, which suggests that digital media doesn't just fill their heads with facts—it touches their hearts, sparking empathy and a sense of responsibility toward nature.

The Unique Role of Pari Island in This Learning Journey

There's something special about grounding this study in Pari Island. As Alimudin and Dharmawati (2022) noted, Pari Island holds immense tourism potential, but conserving its mangroves comes with real challenges that demand thoughtful educational strategies. Using digital media allowed our students to connect the dots between classroom theories and real-world scenarios they encountered on the island. It's like giving them a bridge between what they read or watch and what they see and feel in the field. This hands-on connection aligns beautifully with the ecotourism concept discussed by Benjamin and Bela (2020), who emphasize that education rooted in environmental awareness

OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 52-60

International Journal Education and Computer Studies (IJECS)

DOI: https://doi.org/10.35870/ijecs.v5i2.4278

is key to sustaining places like Pari Island. Moreover, digital tools reflect a modern way of communicating that just works, especially in today's world. Sari and Rani (2021) highlighted how digital marketing excels at reaching wide audiences efficiently, even during tough times like the pandemic. In our case, digital educational media didn't just teach—it built a shared sense of urgency and awareness about environmental issues among students, almost like a virtual call to action.

What This Means for Environmental Education in Universities

So, what can we take away for higher education? Our findings suggest a clear opportunity to weave digital educational media into environmental curricula. Imron and Anwar (2019) proposed that collaborative, education-based strategies in mangrove conservation areas could serve as a model for blending theory with practice. We see digital tools as a perfect fit for this—they can help universities teach ecology in a way that not only builds knowledge but also nurtures long-lasting, pro-environment attitudes. Lecturers and program coordinators could really run with this, using technology to enhance community service projects and conservation initiatives.

Limitations and Where We Go from Here

Sangchumnong (2019) suggests that research in mangrove areas should involve diverse communities and institutions to create truly sustainable models. So, future studies could cast a wider net—perhaps including multiple universities or even local Pari Island communities—to get a fuller picture of how digital education impacts different groups. Another idea is to take a longer view. A longitudinal study could help us understand whether the boosts in knowledge and attitudes we've seen stick around over time or if they fade without reinforcement. Are we sparking a temporary interest, or are we inspiring lifelong conservationists? That's something worth exploring.

Conclusion

Based on the research conducted with students from Universitas Muhammadiyah Bogor Raya (UMBARA), it can be concluded that digital educational media has a significant impact on enhancing students' knowledge and attitudes toward mangrove conservation on Pari Island. This medium proves to be an effective educational tool by presenting information in a visual, interactive, and contextual manner, making it easier for students to grasp complex environmental issues in a deeper and more meaningful way. The average scores for knowledge and attitudes after participating in the digital education program reflect a notable improvement, with knowledge reaching 76.4 and attitudes scoring 78.2 on a 100-point scale. Furthermore, regression analysis confirms the significant influence of digital educational media on both variables, with a significance value below 0.05 and strong beta coefficients. These findings underscore the critical role of innovation in technology-based learning methods, particularly in environmental education. In a broader sense, the digital education program, tailored to the specific context of Pari Island, offers students a holistic learning experience. It not only builds theoretical understanding but also fosters empathy and ecological awareness. This combination of head and heart is vital for inspiring the next generation to care about conservation. However, this study is not without limitations, particularly in terms of the sample size and the localized scope of the research. Future studies are encouraged to expand the reach, involving a larger and more diverse group of participants, and to adopt a longitudinal approach to assess the long-term sustainability of changes in students' behavior and attitudes. Ultimately, the integration of digital educational media into academic programs and community service initiatives at universities is highly recommended. It represents a relevant and adaptive strategy for environmental education that aligns with the demands and opportunities of our rapidly evolving digital era.

References

Abadi, S., Sulandjari, K., & Nasution, N. S. (2022). Pemberdayaan Komunitas Kreasi Alam Bahari Tangkola Melalui Penanaman Mangrove Dengan Sistem Pola Rumpun Berjarak. *J-ABDI: Jurnal Pengabdian kepada Masyarakat*, *1*(11), 3123-3132. https://doi.org/10.53625/jabdi.v1i11.1890.

OPEN ACCESS

E-ISSN 2776-3277, P-ISSN 2776-4729

Volume 5 (2), July 2025, 52-60

International Journal Education and Computer Studies (IJECS)

DOI: https://doi.org/10.35870/ijecs.v5i2.4278

Rahmawati, R., Afriandi, F., & Lisdayanti, E. (2024). Edukasi mangrove: upaya peningkatan literasi bagi kelompok perempuan kawasan konservasi mangrove Aceh Jaya. *SELAPARANG: Jurnal Pengabdian Masyarakat Berkemajuan*, *8*(3), 2424-2434. https://doi.org/10.31764/jpmb.v8i3.25959.

Alimudin, M., & Dharmawati, D. M. (2022). Strategi komunikasi pemasaran digital dalam meningkatkan minat pariwisata Pulau Pari (Mix method: Exploratory sequential design). *Jurnal Ekonomi dan Manajemen Teknologi*, *6*(2), 342–350. https://doi.org/10.35870/emt.v6i2.689

Benjamin, B., & Bela, P. A. (2020). Penataan kawasan wisata Pulau Pari dengan konsep ecotourism. *Jurnal Sains, Teknologi, Urban, Perancangan, Arsitektur (STUPA)*, *2*(1), 1137. https://doi.org/10.24912/stupa.v2i1.7277

Evangelista, D. G. T. (2022). Digital marketing tools and strategies of tourist attractions in Quezon Province. *International Journal of Research Studies in Management*, *10*(2), 105–131. https://doi.org/10.5861/ijrsm.2022.25

Imron, M., & Anwar, M. S. (2019). Strategi kolaborasi pengembangan wisata berbasis edukasi di Clungup Mangrove Conservation Desa Tambakrejo Kabupaten Malang. *Journal of Governance Innovation*, *1*(1), 77–88. https://doi.org/10.36636/jogiv.v1i1.299

Putri, A. N., Nevrita, N., Hindrasti, N. E. K., & Sarkity, D. (2022). Penanaman sikap cinta lingkungan melalui edukasi pelestarian ekosistem mangrove pada siswa. *JPPM (Jurnal Pengabdian dan Pemberdayaan Masyarakat)*, *5*(1), 103. https://doi.org/10.30595/jppm.v5i1.9021

Sangchumnong, A. (2019). Development of a sustainable tourist destination based on the creative economy: A case study of Klong Kone mangrove community, Thailand. *Kasetsart Journal of Social Sciences*, *40*(3), 642–649. https://doi.org/10.1016/j.kjss.2018.02.002

Sari, R. T. P., & Rani, N. L. R. M. (2021). Efektivitas penggunaan digital marketing untuk promosi pada masa pandemi Covid-19 di Petoss Mbok Sarinten Wonosobo. *Komunikasiana: Journal of Communication Studies*, *3*, 109. https://doi.org/10.24014/kjcs.v0i0.14180

Tunggala, S., & Saadjad, K. A. (2019). Strategi komunikasi pada Dinas Kebudayaan dan Pariwisata dalam mempromosikan objek wisata Kabupaten Banggai. *Jurnal Komunikasi*, *11*(2), 197. https://doi.org/10.24912/jk.v11i2.2714.