Assimilation: Indonesian Journal of Biology Education
ISSN 2621-7260 (Online)
Journal homepage: https://ejournal.upi.edu/index.php/asimilasi

Analysis of students' attitudes towards ethnobiology-based local biodiversity conservation

Adi Hartono[1*], Tri Mustika Sarjani[1], Dini Fitria[1], Nirwana Anas[2]
[1)] Biology Education Study Program, Universitas Samudra, Prof. Dr. Syarief Thayeb Street, Meurandeh, District Langsa Lama, Langsa City, Aceh, Indonesia 24416
[2)] Elementary School Teacher Study Program, Universitas Islam Negeri Sumatera Utara, Willem Iskandar Street, Pasar V, Medan Estate, North Sumatra, Indonesia 20371

*Corresponding author: adihartono@unsam.ac.id

OPEN ACCESS

ARTICLE HISTORY
Received: 23 February 2026
First Revised: 06 March 2026
Accepted: 03 July 2026
First Available Online: 29 July 2026
Publication Date: 29 July 2026

KEYWORDS
Ethnobiology
Biology education
Preservation of local biodiversity
Student attitudes

ABSTRACT

Empirical evidence on student attitudes toward local biodiversity conservation in ethnobiology-based learning remains limited, particularly in higher education, where local wisdom is often underrepresented. This study analyzed university students' ecological awareness, appreciation of local wisdom, and commitment to biodiversity conservation through an ethnobiology-oriented learning approach. A descriptive mixed-method design was employed using a Likert-scale questionnaire and semi-structured interviews with 50 sixth-semester Biology Education students at the State Islamic University of North Sumatra. Quantitative data were analyzed descriptively, while qualitative findings provided contextual support. Results showed high scores for ecological awareness (87.7%), appreciation of local wisdom (88.8%), and conservation commitment (88.8%). Students demonstrated positive attitudes reflected in responsibility, cultural attachment, and willingness to participate in conservation. Qualitative findings indicated that interactions with local communities and biodiversity-related field activities strengthened students' understanding of the relationship between ecological systems and local knowledge. The ethnobiology approach effectively connected scientific concepts with socio-cultural contexts, promoting meaningful learning. Overall, ethnobiology-based learning contributed to the development of ecological and cultural awareness. These findings highlight the value of integrating local wisdom and community-based experiences into biology curricula to foster contextual and sustainable environmental education in higher education.

INTRODUCTION

Local biodiversity is an essential component of Indonesia's ecological and socio-cultural heritage. Across many indigenous and local communities, biological resources are embedded in traditional ecological knowledge, cultural beliefs, medicinal practices, and customary stewardship systems that have evolved through long-term interactions between humans and nature (Berkes, 2026; Rangel et al., 2024; Tarmizi et al., 2025). However, rapid modernization, biodiversity loss, and the gradual erosion of indigenous knowledge threaten the continuity of these socio-ecological relationships, posing challenges for biology education to preserve local ecological knowledge while promoting biodiversity conservation (Manns et al., 2025; Meuler et al., 2023).

In response to these challenges, ethnobiology-based learning has emerged as a promising educational approach because it integrates biological knowledge with indigenous knowledge, local cultural practices, and community experiences. Ethnobiology emphasizes reciprocal interactions between humans and biological resources and promotes the sustainable use and conservation of biodiversity through traditional ecological knowledge (Aziz et al., 2022; Berkes, 2026). Developing ethnobiology-based teaching materials has also been shown to improve students' contextual understanding of biodiversity while preserving local knowledge and cultural identity (Horota et al., 2023; Leksono et al., 2015). This approach aligns with ethnopedagogical principles that connect scientific concepts with local wisdom and students' cultural experiences, thereby fostering scientific literacy, environmental responsibility, and sustainability awareness (Ajayi et al., 2023; Kamila et al., 2024; Sukiastini et al., 2024). This aligns with recent efforts to systematically integrate ethnoscience into science instruction, which underscore the potential of ancestral ecological knowledge to enrich students' conceptual understanding while strengthening their cultural identity (Festiyed et al., 2026; Ismail et al., 2024).

Despite its recognized educational potential, ethnobiology remains insufficiently integrated into formal biology curricula. Biology learning continues to emphasize universal scientific concepts while providing limited opportunities for students to investigate local biodiversity through indigenous knowledge and community-based experiences (Hameed, 2020; Sukiastini et al., 2024). This issue is particularly relevant in North Sumatra, where rich biodiversity and local traditions related to medicinal plants, traditional agriculture, and community-based environmental practices have not been systematically integrated into higher education biology learning. Recent ethnobotanical explorations in other Indonesian regions have similarly shown that community knowledge of medicinal plants remains rich yet increasingly vulnerable to cultural shifts, reinforcing the urgency of documenting and integrating such knowledge into formal science education (Fitria, 2025).

Previous studies have consistently demonstrated that integrating local wisdom into science education enhances students' ecological literacy, scientific attitudes, and conservation awareness (Ardoin et al., 2020; Sukiastini et al., 2024). Likewise, ethnobiology-based learning resources and ethnopedagogical approaches have been shown to strengthen students' appreciation of biodiversity while improving their understanding of scientific concepts within authentic cultural contexts (Horota et al., 2023; Leksono et al., 2015). Furthermore, local wisdom-based biodiversity learning has been associated with positive conservation attitudes, particularly regarding environmental responsibility and biodiversity stewardship (Sari & Susanti, 2024).

Although previous studies have demonstrated the educational benefits of ethnobiology, ethnopedagogy, and local wisdom-based science learning, existing research has primarily focused on developing teaching materials, evaluating learning models, or assessing cognitive learning outcomes (Horota et al., 2023; Leksono et al., 2015; Sukiastini et al., 2024). Fewer studies have examined university students' conservation attitudes as multidimensional constructs encompassing ecological awareness, appreciation of local wisdom, and commitment to biodiversity conservation (Agustinus et al., 2025; Ardoin et al., 2020).

DOI: https://doi.org/10.17509/aijbe.v9i2.952
e-ISSN 2621-7260

Understanding university students' attitudes toward biodiversity conservation is particularly important because ecological responsibility is shaped not only by scientific knowledge but also by cultural values, environmental experiences, and emotional attachment to local ecosystems (Herwidiah et al., 2023). As future educators, biology education students are expected to develop conservation-oriented values that can be transferred to future generations through their teaching practices. Therefore, investigating students' conservation attitudes may provide valuable insights for designing more contextual, culture-based, and sustainability-oriented biology learning models in higher education.

Based on these considerations, this study aimed to analyze university students' conservation attitudes toward local biodiversity within an ethnobiology-based learning context. Specifically, the study examined three interrelated dimensions: ecological awareness, appreciation of local wisdom, and commitment to biodiversity conservation. Accordingly, this study addressed the following research questions: (1) How are students' ecological awareness, appreciation of local wisdom, and conservation commitment reflected in ethnobiology-based learning? and (2) How does ethnobiology-based learning contribute to the development of students' conservation attitudes toward local biodiversity? The findings are expected to contribute to the development of biology education practices that integrate local wisdom, environmental sustainability, and culturally responsive learning experiences in higher education.

METHODS

This study employed a descriptive mixed-methods design with a predominantly quantitative approach to analyze students' attitudes toward ethnobiology-based local biodiversity conservation. The quantitative component was used to measure students' attitudes systematically through survey data, while the qualitative component was intended to enrich the interpretation of the quantitative findings through interviews (Sugiyono, 2021).

The research was conducted in the Biology Education Study Program at the Faculty of Tarbiyah and Teacher Training, State Islamic University of North Sumatra, during June–July 2025. The study involved all sixth-semester students (90 students) as the population. A purposive sampling technique was used to select 50 students based on two criteria: (1) students had completed learning materials related to ecosystems and biodiversity, and (2) students originated from areas that still maintain socio-cultural practices related to local biodiversity. These criteria were applied to ensure that participants possessed relevant experience and contextual understanding of ethnobiological learning and local conservation practices.

The main instrument was a Likert-scale questionnaire consisting of 30 statements with four response options ranging from strongly disagree to agree strongly. The questionnaire was developed based on three indicators: ecological awareness, appreciation of local wisdom, and conservation commitment. Detailed indicators and statement items are presented in Table 1. Content validation was conducted using expert judgment from two biology education lecturers and one conservation practitioner, focusing on content relevance, statement clarity, and indicator suitability. The instrument reliability test showed a Cronbach's Alpha value of 0.89, indicating high reliability.

Data collection was conducted through direct distribution of questionnaires to all respondents. In addition, semi-structured interviews were conducted with 30 purposively selected participants based on their willingness to participate and the variation in questionnaire responses. The interviews aimed to provide deeper insights into students' perspectives on local biodiversity conservation and ethnobiology-based learning experiences.

Quantitative data were analyzed descriptively using mean and percentage scores for each indicator. The percentage score was obtained by dividing the total score achieved by the maximum possible score and then multiplying by 100%. The resulting percentages were interpreted using attitude category intervals adapted from (Azwar, 2019; Widoyoko, 2012): 81–100% (very positive),

DOI: https://doi.org/10.17509/aijbe.v9i2.952
e-ISSN 2621-7260

61–80% (positive), 41–60% (moderate), 21–40% (negative), and 0–20% (very negative). Meanwhile, qualitative data were analyzed thematically through three stages: coding interview responses, categorizing recurring ideas, and interpreting themes related to ecological awareness, local wisdom, and conservation commitment. The combination of quantitative and qualitative findings was used to obtain a more comprehensive understanding of students' attitudes toward ethnobiology-based local biodiversity conservation (Table 1).

Table 1
Research instrument grid.

Indicators	Statements
Ecological Awareness	1. I understand the importance of local plant/animal species in my environment. 2. The existence of local species is important for maintaining ecosystem balance. 3. I would feel a loss if local species in my area became extinct. 4. I know several species of plants/animals that are typical of my area. 5. Conserving local species is a shared responsibility
Appreciation of Local Wisdom	6. I am interested in studying the use of local plants/animals in community culture. 7. I appreciate folk tales or myths related to local species in my area. 8. I feel it is important to know local wisdom regarding the use of medicinal plants in my area. 9. The use of local species by indigenous communities needs to be taught in schools 10. Local culture is closely related to efforts to preserve local species in my area.
Commitment to Conservation	11. I am willing to participate in reforestation activities or planting local species. 12. I want to contribute to preserving the plant/animal species typical of my area. 13. I support teaching about the conservation of local species in schools. 14. I want to be an environmental conservation volunteer in the future. 15. I will invite friends or family to participate in preserving local species in my area.

(Source: adapted from Amri et al., 2025; Hamid et al., 2026; Sari & Susanti, 2024)

DOI: https://doi.org/10.17509/aijbe.v9i2.952
e-ISSN 2621-7260

The analysis of the questionnaire distribution data was interpreted according to the category ranges in Table 2.

Table 2
Student attitude category

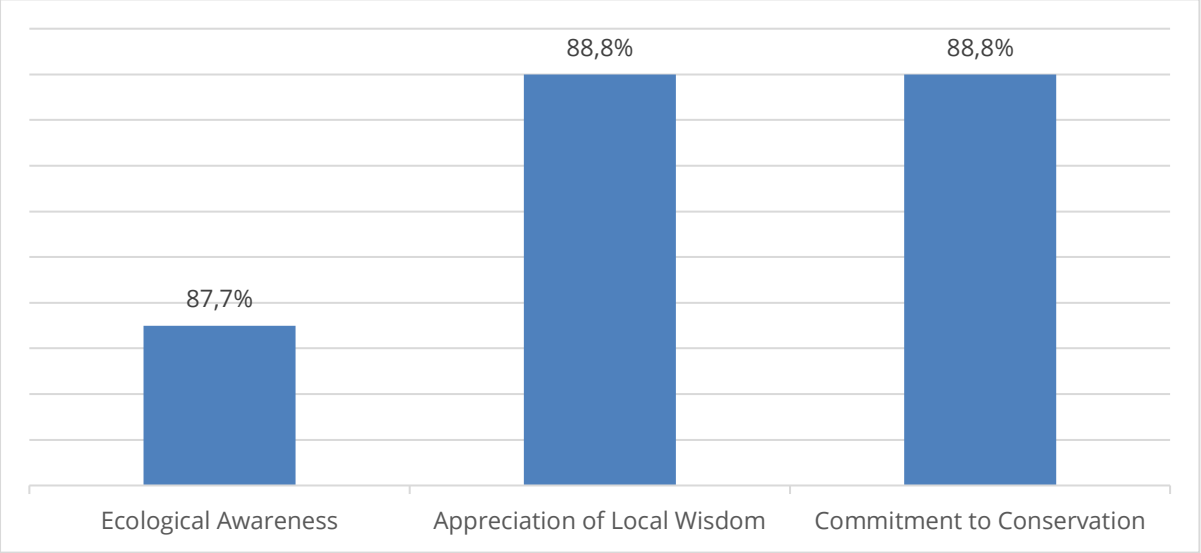
No.	Total Score Range (%)	Category
1.	81-100	Very positive
2.	61-80	Positive
3.	41-60	Moderate
4.	21-40	Negative
5.	0-20	Very negative

(Source: Azwar, 2019; Widoyoko, 2012)

RESULTS AND DISCUSSION

Based on the research conducted, the following results were obtained.

Figure 1
Students' attitude scores toward ethnobiology-based local biodiversity conservation.



The results showed that students demonstrated high levels of ecological awareness (87.7%), appreciation of local wisdom (88.8%), and commitment to biodiversity conservation (88.8%). These findings suggest that ethnobiology-based learning may foster positive conservation attitudes by linking scientific knowledge to students' cultural experiences and local environmental practices. Students' high ecological awareness indicates that they view biodiversity conservation not only as an environmental issue but also as integral to community life. This interpretation aligns with Berkes (2026), who emphasized that traditional ecological knowledge develops through ongoing interactions between communities and their surrounding ecosystems. Similarly, Ardoin et al. (2020) argued that environmental education grounded in local contexts enhances ecological literacy and conservation awareness, while Otto and Pensini (2017) demonstrated that direct experiences with nature strengthen individuals' emotional connection to biodiversity and promote pro-environmental attitudes. This finding is further corroborated by Restović and Bulic (2024), who found that research-based learning on nature conservation significantly improved both students'

DOI: https://doi.org/10.17509/aijbe.v9i2.952
e-ISSN 2621-7260

ecological knowledge and attitudes, and by Hastuti et al. (2024), who identified environmental knowledge and environmental responsibility as key predictors of pro-environmental behavior among Indonesian university students.

The findings also suggest that cultural context plays an important role in shaping students' appreciation of local wisdom. Students not only recognized biodiversity from a biological perspective but also valued cultural practices associated with local species, including traditional medicine, customary conservation, and indigenous ecological knowledge. This finding aligns with Sukiastini et al. (2024), who reported that ethnopedagogical approaches strengthen students' understanding of scientific concepts by integrating local wisdom into science learning. Likewise, Horota et al. (2023) and Leksono et al. (2015) demonstrated that ethnobiology-based instructional materials improve students' contextual understanding of biodiversity while preserving cultural identity and traditional ecological knowledge. This finding reinforces recent ethnobotanical documentation showing that community knowledge of medicinal plants remains a rich yet vulnerable resource for contextual science learning (Fitria, 2025) and is consistent with the broader argument that ethnoscience-based instruction can serve as a bridge between ancestral heritage and modern scientific practice (Festiyed et al., 2026; Ismail et al., 2024). This is further reinforced by ethnobotanical documentation from North Sumatra itself, where indigenous communities continue to rely on medicinal plant knowledge passed down through generations (Rambey et al., 2024), as well as by broader syntheses showing that such traditional medicinal knowledge remains widespread yet insufficiently documented across Indonesia (Febriyanti et al., 2026). Similarly, Apriansyah et al. (2024) demonstrated that ethnoscience-based instructional materials centered on medicinal plant diversity can enhance students' contextual understanding while cultivating appreciation for indigenous knowledge. These findings also support Berkes' (2026) argument that biodiversity conservation is inseparable from the preservation of indigenous knowledge systems and community stewardship.

The high level of conservation commitment may also be linked to students' lived experiences and participatory learning activities. Interviews revealed that students who documented local species, interviewed community members, and engaged in conservation-related activities expressed stronger intentions to protect local biodiversity. One participant stated, “We feel responsible for protecting the environment because the species in this area are not only part of nature, but also our culture.” This statement reflects how cultural identity can reinforce ecological responsibility. Similar findings were reported by Sari and Susanti (2024), who found that local wisdom-based biodiversity learning promoted positive conservation attitudes among students. Likewise, ethnobiology-based practical learning has been shown to strengthen scientific attitudes while preserving local culture through authentic environmental experiences (Sunariyati et al., 2019). Ajayi et al. (2023) further argued that contextual and community-oriented environmental education encourages students to become active participants in biodiversity conservation rather than passive recipients of scientific knowledge. This is consistent with Artika et al. (2024), who found that ethnoscience-integrated problem-based learning strengthened students' character values and conservation attitudes, and with Jihannita et al. (2024), who reported that ethnoscience-based science modules effectively improved both scientific literacy and cultural preservation attitudes among students. Furthermore, Rizki and Asteria (2023) emphasized that local ecological knowledge continues to provide meaningful benefits for conservation programs across Indonesia, reinforcing the relevance of embedding such knowledge within formal education.

Several interview responses further reflected the development of ecological awareness through direct engagement with local communities and biodiversity-related practices. Some students explained that understanding the ecological functions of local species and their role in traditional life heightened their awareness of the importance of conservation. One participant stated, “If we do not start protecting these plants now, future generations may no longer know them.” This response illustrates students' recognition of intergenerational responsibility for biodiversity conservation. These findings align with Berkes (2026), who emphasized that

DOI: https://doi.org/10.17509/aijbe.v9i2.952
e-ISSN 2621-7260

traditional ecological knowledge is transmitted across generations through ongoing interaction with local environments. Similarly, Ardoin et al. (2020) highlighted that authentic environmental learning experiences promote long-term ecological responsibility and conservation-oriented behavior. This intergenerational perspective is also documented by Akhmar et al. (2023), who described how traditional ecological knowledge in South Sulawesi is culturally transmitted across generations as a strategy for both ecological and cultural survival.

Overall, these findings support the argument that ethnobiology-based learning offers meaningful opportunities to integrate the cognitive, affective, and sociocultural dimensions of biodiversity education. Students are encouraged not only to understand scientific concepts but also to appreciate the cultural significance of biodiversity and their responsibility for environmental stewardship. This interpretation is supported by Berkes (2026), who emphasized the importance of integrating indigenous knowledge into environmental stewardship. Similarly, Horota et al. (2023) and Sukiastini et al. (2024) demonstrated that integrating ethnopedagogical and ethnobiological perspectives into science learning enhances students' scientific understanding while strengthening appreciation for local wisdom. These findings are also consistent with Agustinus et al. (2025), who highlighted the potential of culturally contextualized science learning to foster critical thinking, creativity, and environmental responsibility. This is further echoed by Amin and Ritonga (2024), who noted that the diversity and local wisdom of North Sumatra provide valuable capital for developing innovative, culturally responsive learning models among the millennial generation.

Future research should also investigate whether positive conservation attitudes developed through ethnobiology-based learning are sustained over time and translated into observable conservation behaviors across different educational and sociocultural contexts.

CONCLUSION

This study aimed to analyze university students' attitudes toward ethnobiology-based local biodiversity conservation by examining three dimensions: ecological awareness, appreciation of local wisdom, and commitment to biodiversity conservation. The findings indicate that students demonstrated positive attitudes across all three dimensions, suggesting that ethnobiology-based learning supports the development of conservation-oriented attitudes by connecting biological concepts with local cultural experiences and community practices. Contextual and participatory learning activities enabled students to understand biodiversity not only from a scientific perspective but also from socio-cultural and environmental perspectives, highlighting the value of integrating local wisdom into biology education.

These findings imply that ethnobiology-based learning can serve as a meaningful approach to promoting biodiversity conservation and culturally relevant biology education in higher education. However, this study was conducted within a specific higher education context in North Sumatra and relied primarily on self-reported data, which may not fully reflect students' actual conservation behaviour. Therefore, the findings should be interpreted within the scope of the study design and participant characteristics. Future research is recommended to employ longitudinal, experimental, or multi-institutional approaches to examine the long-term influence of ethnobiology-based learning on students' conservation behaviour across different educational contexts.

DOI: https://doi.org/10.17509/aijbe.v9i2.952
e-ISSN 2621-7260

REFERENCES

Agustinus, S., Permana, I., Ardianto, D., Permanasari, A., & Nuraeni, E. (2025). Educational transformation through ethno-STEM: Exploring its potential, challenges, and impact on 21st century skills. *Assimilation: Indonesian Journal of Biology Education*, *8*(1), 1–16. https://doi.org/10.17509/aijbe.v8i1.80144

Ajayi, O. A., Akintoye, O. H., Akindoju, O. G., & Onowugbeda, F. (2023). Impact of ethnobiology-based instruction and peer tutoring on the achievement of senior secondary school biology students in Ogun State Southwest Nigeria. *World Journal of Advanced Research and Reviews*, *18*(1), 1197–1207. https://doi.org/10.30574/wjarr.2023.18.1.0737

Akhmar, A. M., Rahman, F., Supratman, S., Hasyim, H., & Nawir, M. (2023). The cultural transmission of traditional ecological knowledge in Cerekang, South Sulawesi, Indonesia. *SAGE Open*, *13*(4), 1–17. https://doi.org/10.1177/21582440231194160

Amin, M., & Ritonga, A. D. (2024). Diversity, local wisdom, and unique characteristics of millennials as capital for innovative learning models: Evidence from North Sumatra, Indonesia. *Societies*, *14*(12), 260. https://doi.org/10.3390/soc14120260

Amri, C., Roza, H., & Wira, S. (2025). Integration of Minangkabau ethnoecology in biology education: Analysis of student needs. *Jurnal Penelitian Pendidikan IPA*, *11*(11), 1240–1252. https://doi.org/10.29303/jppipa.v11i11.12938

Apriansyah, M. A., Syarif, St. H., Anugra, N., & Nikmatullah, M. (2024). Development of an ethnoscience based e-module on the diversity material of medicinal plants of the Bugis tribe. *Biosfer: Jurnal Tadris Biologi*, *15*(1), 1–14. https://doi.org/10.24042/biosfer.v15i1.22412

Ardoin, N. M., Bowers, A. W., & Gaillard, E. (2020). Environmental education outcomes for conservation: A systematic review. *Biological Conservation*, *241*, 108224. https://doi.org/10.1016/j.biocon.2019.108224

Artika, A., Copriady, J., & Rasmiwetti, R. (2024). Development of PBL-based e-student worksheet using an ethnoscience approach to improve students' character values and conservation attitudes on redox material. *Jurnal Penelitian Pendidikan IPA*, *10*(4), 1495–1505. https://doi.org/10.29303/jppipa.v10i4.6791

Aziz, M. A., Volpato, G., Fontefrancesco, M. F., & Pieroni, A. (2022). Perceptions and revitalization of local ecological knowledge in four schools in Yasin Valley, North Pakistan. *Mountain Research and Development*, *42*(4), 1–9. https://doi.org/10.1659/MRD-JOURNAL-D-21-00061.1

Azwar, S. (2019). *Penyusunan skala psikologi* (2nd ed.). Pustaka Belajar.

Berkes, F. (2026). *Sacred ecology: Learning from indigenous knowledge and stewardship*. Routledge, Taylor & Francis Group.

Febriyanti, R. M., Ramadhania, Z. M., Tjitraresmi, A., Indradi, R. B., Maisyarah, I. T., Maundu, P. M., Muhaimin, M., & Sujarwo, W. (2026). A systematic review of ethnobotanical study in Indonesia: Diversity and cultural patterns of medicinal plant use. *Journal of Ethnobiology and Ethnomedicine*, *22*(1), 42. https://doi.org/10.1186/s13002-026-00879-4

Festiyed, F., Diliarosa, S., Nengsih, R., & Marwiyah, M. (2026). *Integrasi etnosains dalam pembelajaran IPA*. CV Eureka Media Aksara.

Fitria, A. A. (2025). *Eksplorasi tumbuhan berpotensi obat di Desa Tanjung Raja: Identifikasi dan pemanfaatan sebagai upaya pelestarian pengetahuan lokal* [Bachelor's thesis, Universitas Islam Negeri Raden Intan Lampung]. https://repository.radenintan.ac.id/id/eprint/40706

Hameed, S. (2020). Global citizenship education practices in Singapore and Australia: The fusion of the global eye with the national eye. *International Journal of Comparative Education and Development*, *22*(3), 169–184. https://doi.org/10.1108/IJCED-10-2019-0052

Hamid, S., Swandi, A., Amal, A., S, M. I., & Arif, A. (2026). Exploration of local wisdom of the archipelago region to design Ethno-STEM project-based learning modules for ecological

awareness learning. *F1000Research*, *15*, 411. https://doi.org/10.12688/f1000research.178677.1

Hastuti, K. P., Arisanty, D., Muhaimin, M., Angriani, P., Alviawati, E., Aristin, N. F., & Rahman, A. M. (2024). Factors affecting pro-environmental behaviour of Indonesian university students. *Journal of Turkish Science Education*, *21*(1), 102–117. https://doi.org/10.36681/tused.2024.006

Herwidiah, A. P., Syamswisna, S., & Mardiyyaningsih, A. N. (2023). Augmented reality of food plants as a biodiversity learning media for 10th grade high school: A feasibility analysis. *Assimilation: Indonesian Journal of Biology Education*, *6*(2), 85–96. https://doi.org/10.17509/aijbe.v6i2.60068

Horota, S., Damopolii, I., Kilmaskossu, J. P., & Nusantari, E. (2023). Development of an ethnobiology supplement book based on the study of medicinal plants in Wonawa District, Kepulauan Yapen Serui Regency. *Inornatus: Biology Education Journal*, *3*(1), 40–49. https://doi.org/10.30862/inornatus.v3i1.421

Ismail, I. A., Mawardi, M., Kurniawati, D., Arif, K., Nofrialdi, R. (2024). *Dari warisan leluhur ke laboratorium modern: Etnosains mewarnai pembelajaran IPA*. LPPM AAI Padang. https://doi.org/10.5281/zenodo.14323693

Jihannita, J., Fadly, W., Ekapti, R. F., Luthfiana, D., & Widowati, A. (2024). The development of science module integrated with ethnoscience of Singo Barong mask to improve scientific literacy and cultural preservation attitudes. *Journal of Innovation in Educational and Cultural Research*, *5*(2), 356–363. https://doi.org/10.46843/jiecr.v5i2.790

Kamila, K., Wilujeng, I., Jumadi, J., & Ungirwalu, S. Y. (2024). Analysis of integrating local potential in science learning and its effect on 21st century skills and student cultural awareness: Literature review. *Jurnal Penelitian Pendidikan IPA*, *10*(5), 223–233. https://doi.org/10.29303/jppipa.v10i5.6485

Leksono, S. M., Syachruroji, A., & Marianingsih, P. (2015). Pengembangan bahan ajar biologi konservasi berbasis etnopedagogi. *Jurnal Kependidikan: Penelitian Inovasi Pembelajaran*, *45*(2), 168–183.

Manns, M., Heiss, J., Morohashi, J., & Loupis, L. (2025). Harnessing indigenous knowledge for education for sustainable development. *Journal of Education for Sustainable Development*, *19*(2), 157–167. https://doi.org/10.1177/09734082251360875

Meuler, M., Lee, J., Foutch, K., Al-Khayat, N., Boukouzis, K., Christensen, P., Crooks, C., Hassanain, L. M., Karimi, P., Kim, G. V., Randall, A., Redford, I. K., Socko, R., & Theobald, E. J. (2023). Biology in a social context: A comprehensive analysis of humanization in introductory biology textbooks. *Frontiers in Education*, *8*, 1–14. https://doi.org/10.3389/feduc.2023.1165239

Otto, S., & Pensini, P. (2017). Nature-based environmental education of children: Environmental knowledge and connectedness to nature, together, are related to ecological behaviour. *Global Environmental Change*, *47*, 88–94. https://doi.org/10.1016/j.gloenvcha.2017.09.009

Rambey, R., Nelasufa, F., Athoriez, A. P. M., Solihin, S., Rahmawaty, R., Susilowati, A., & Afifuddin, Y. (2024). Ethnobotanical study of medicinal plants by indigenous community of Aek Guo Village, Mandailing Natal District, Indonesia. *Biodiversitas Journal of Biological Diversity*, *25*(3). https://doi.org/10.13057/biodiv/d250318

Rangel, J. M. L., do Nascimento, A. L. B., & Ramos, M. A. (2024). The influence of urbanization on local ecological knowledge: A systematic review. *Journal of Ethnobiology and Ethnomedicine*, *20*(1), 106. https://doi.org/10.1186/s13002-024-00747-z

Restović, I., & Bulic, M. (2024). Research-based learning about nature conservation influences students' attitudes and knowledge. *Education Sciences*, *14*(12), 1410. https://doi.org/10.3390/educsci14121410

Rizki, M. N., & Asteria, D. (2023). Local ecological knowledge and its benefit to conservation programs in Indonesia. *International Journal of Conservation Science*, *14*(4), 1527–1548.

Sari, D. P., & Susanti, T. (2024). Profile of students' conservation attitudes in forest management and plant diversity management based on local wisdom. *Biosfer*, *17*(1), 63–78. https://doi.org/10.21009/biosferjpb.32459

Sugiyono. (2021). *Metode penelitian pendidikan: Kuantitatif, kualitatif, dan R&D* (Rev Ed). Alfabeta.

Sukiastini, I. G. A. N. K., Suastra, I. W., & Arnyana, I. B. P. (2024). Integrasi etnopedagogi dalam pembelajaran IPA untuk memperkaya pemahaman budaya dan sains. *Edukatif: Jurnal Ilmu Pendidikan*, *6*(6), 6507–6518.

Sunariyati, S., Suatma, S., & Miranda, Y. (2019). Efforts to improve scientific attitude and preservation of local culture through ethnobiology-based biological practicum. *EDUSAINS*, *11*(2), 255–263. https://doi.org/10.15408/es.v11i2.13622

Tarmizi, A. D., Sriyati, S., & Solihat, R. (2025). The local potential of Peng'Angguran village as a source of biology learning. *Assimilation: Indonesian Journal of Biology Education*, *8*(3), 363–374. https://doi.org/10.17509/aijbe.v8i3.88441

Widoyoko, S. E. P. (2012). *Teknik penyusunan instrumen penelitian*. Pustaka Pelajar.

Acknowledgment

Researcher would like to thank the university which funded this research and the participants who were involved in this research.

Authors' Note

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

How to Cite this Article

Hartono, A., Sarjani, T. M., Fitria, D., & Anas, N. (2026). Analysis of students' attitudes towards ethnobiology-based local biodiversity conservation. *Assimilation: Indonesian Journal of Biology Education, 9*(2), 159-168. https://doi.org/10.17509/aijbe.v9i2.952