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Research Article

Tapak Raja Cave as a Contextual Social Studies Learning Resource for Strengthening Students' Environmental Awareness and Ecotheological Values

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Abstract
This study aims to analyze the utilization of Tapak Raja Cave as a contextual Social Studies learning resource for strengthening students' environmental awareness and ecotheological values at MTs Negeri 3 Penajam Paser Utara. The study employed a descriptive qualitative design supported by descriptive quantitative summaries involving 20 seventh-grade students. Data were collected through observation, student reflection sheets, semi-structured interviews, and documentation during a field-based learning activity at Tapak Raja Cave. The findings showed that cave-based Social Studies learning generated high positive affective responses among students, ranging from 90% to 100%. Students' cognitive understanding reached 100%, internalization of ecotheological and character values reached 96.25%, evaluation of the learning process reached 91.9%, and open-ended reflection reached 94%. These findings indicate that Tapak Raja Cave can function as a contextual learning site that connects Social Studies concepts with environmental conservation, local community livelihoods, and religious ecological awareness. The study contributes to the development of local-potential-based Social Studies learning by demonstrating how a cave ecosystem can be pedagogically used to integrate environmental awareness and ecotheological value formation in madrasah education.

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Introduction

Education in the twenty-first century is increasingly required to develop learners who are not only cognitively competent but also socially responsible, environmentally aware, and morally grounded. In contemporary educational discourse, learning is expected to move beyond the transmission of textbook-based knowledge and to cultivate critical thinking, collaboration, ecological responsibility, and reflective citizenship in response to complex socio-environmental challenges (Hu & Mou, 2025; Kuo et al., 2019; Taufikin, 2025). This demand is particularly relevant to Social Studies education because Social Studies is designed to help students understand the relationship between humans, society, space, resources, culture, and the environment in an integrated manner (Ardoin et al., 2020; UNESCO, 2020; van de Wetering et al., 2022). However, in many school and madrasah contexts, Social Studies learning is still frequently practiced through teacher-centered instruction, textbook memorization, and classroom-bound activities, which may limit students' opportunities to experience social and ecological realities directly (Mann et al., 2022; Monroe et al., 2019; Örnek & Yel, 2025). Such a condition indicates the need for a more contextual, experiential, and place-based

learning model that enables students to connect curriculum content with real environmental and community issues.

Contextual Teaching and Learning and outdoor learning have been widely recognized as pedagogical approaches that can bridge the gap between abstract classroom knowledge and authentic real-world experience. Contextual learning enables students to construct meaning by relating academic concepts to concrete situations in their immediate environment, while outdoor learning provides direct sensory, social, and reflective experiences that strengthen engagement and understanding (Ali et al., 2023; Parker & Prabawa-Sear, 2020; Wakhidah & Erman, 2022). Systematic reviews on nature-specific outdoor learning show that learning outside the classroom can support students' socio-emotional development, academic engagement, collaboration, and wellbeing when it is intentionally designed and pedagogically structured (Anggraini et al., 2024; Cholil & Parker, 2021; UNESCO, 2021). Similarly, place-based education emphasizes the use of local landscapes, community resources, cultural practices, and ecological sites as meaningful learning spaces that connect students' lived experiences with broader social and environmental concepts (Hancock, 2020; Moll et al., 2022; Wahyudin & Malik, 2019). Therefore, local natural resources such as caves, forests, rivers, mangroves, and conservation areas should not be viewed merely as tourism objects but also as potential learning laboratories that can strengthen students' ecological literacy, social awareness, and character formation.

Environmental education has become increasingly urgent because environmental degradation, biodiversity loss, climate-related risks, waste problems, and unsustainable resource use require early educational intervention. Studies on environmental literacy and environmental awareness consistently emphasize that students' ecological responsibility develops through the integration of knowledge, affective sensitivity, values, and behavioral intention (Ardoin et al., 2018; Barrable & Booth, 2020; El Rizaq & Al Azizani, 2025). Environmental education is also more effective when students are actively involved in observation, reflection, community-based learning, and direct environmental practices rather than merely receiving conceptual explanations in the classroom (Hestiningtyas et al., 2025; Rohman et al., 2024; Zabidi et al., 2021). In Indonesia, environmental education has been discussed through various frameworks, including environmental literacy, ecoliteracy, Adiwiyata schools, ecopedagogy, and Education for Sustainable Development (Begum et al., 2021; Djirong et al., 2024; Mustofa & Sueb, 2023). Within Social Studies learning, environmental issues are especially relevant because students are expected to understand how human activities, local economies, natural resource management, and community welfare are interrelated (Abd Rahman et al., 2020; Benavot & McKenzie, 2021; Fua et al., 2018). Thus, Social Studies provides a strategic curricular space for cultivating ecological awareness through contextual and community-based learning.

In the context of Islamic education, environmental awareness is not merely a cognitive or ecological matter but also a theological and ethical responsibility. Islamic ecotheology emphasizes that human beings are entrusted as *khalifah* and bear an *amanah* to maintain balance, avoid environmental destruction, and care for creation as part of religious devotion (Chawla, 2020; Fua et al., 2018; Kissling & Bell, 2020). Recent studies have shown that integrating eco-theological values into Islamic education can strengthen students' environmental awareness, moral responsibility, and religiously grounded ecological behavior (Fua et al., 2018; Mustofa, 2025; Sabtina et al., 2025). Wakhidah & Erman (2022) also argue that environmental education content within Islamic Religious

Education can support students' understanding of ecological responsibility when it is connected to daily practices and curriculum implementation. This perspective is increasingly relevant in Indonesia because ecotheology has been formally positioned as one of the priority programs of the Ministry of Religious Affairs for 2025–2029 through KMA No. 244 of 2025 (Ali et al., 2023; Kementerian Agama Republik Indonesia, 2025; Mann et al., 2022). Therefore, madrasahs have an important role in translating ecological theology into meaningful learning practices that connect religious values, environmental care, and students' everyday experiences.

Tapak Raja Cave in Wonosari Village, Sepaku District, Penajam Paser Utara Regency, provides a relevant local context for integrating Social Studies learning, environmental education, and Islamic ecotheology. The cave contains natural features such as stalactites, stalagmites, cave ecosystems, and bat habitats, while its surrounding area is also connected to local economic activities and community-based tourism management. As a learning resource, Tapak Raja Cave can help students understand natural resources, conservation, community livelihoods, local economic potential, and human environment interaction through direct observation. Its location within the broader Nusantara Capital City area also gives the site additional significance because the development of IKN is officially associated with sustainable urban planning, environmental governance, and the vision of a forest city (Government of Indonesia, 2022; Otorita Ibu Kota Nusantara, 2023).This contextual setting creates an opportunity for Social Studies learning to engage students not only with local natural phenomena but also with national sustainability narratives and religiously informed environmental responsibility.

Although previous studies have examined outdoor learning, place-based education, environmental literacy, Social Studies learning, and Islamic ecotheology, several limitations remain. First, much of the existing outdoor learning research focuses on general environmental education or science learning, while fewer studies examine natural sites as Social Studies learning resources that integrate ecological, socio-economic, cultural, and spiritual dimensions (Levy et al., 2023; Şeker, 2023; Zong, 2022). Second, studies on environmental awareness in schools often emphasize literacy, attitudes, or green behavior, but they do not always connect these outcomes with local community livelihoods and religious meaning-making (Niman, 2025; Wardani et al., 2025; Zong, 2022). Third, studies on Islamic ecotheology have increasingly discussed curriculum integration and religious pedagogy, yet empirical research that links ecotheology with field-based Social Studies learning in madrasah contexts remains limited (Ardoin et al., 2018; Barrable & Booth, 2020; Rohman et al., 2024). Fourth, research on local caves as educational resources tends to focus on tourism potential, geography, or natural science, while limited attention has been given to cave-based learning as an integrated pedagogical space for environmental awareness, Social Studies understanding, and ecotheological value formation. This gap indicates the need for empirical research that examines how a local cave ecosystem can function as a contextual learning resource in madrasah-based Social Studies education.

Based on these gaps, this study aims to analyze the utilization of Tapak Raja Cave as a contextual Social Studies learning resource to strengthen students' environmental awareness and ecotheological values at MTsN 3 Penajam Paser Utara. Specifically, this study investigates how cave-based contextual learning supports students' affective responses, cognitive understanding, value internalization, and reflective awareness of environmental conservation. The novelty of this study lies in its integration of local cave-based learning, Social Studies pedagogy, environmental awareness,

and Islamic ecotheology within the context of a madrasah located near the Nusantara Capital City area. By positioning Tapak Raja Cave as both a natural learning laboratory and a faith-based ecological learning space, this study contributes to the development of contextual Social Studies learning that is locally grounded, environmentally responsive, and aligned with the ecotheology movement in Indonesian Islamic education.

Method

This study employed a descriptive qualitative design supported by descriptive quantitative summaries to examine the utilization of Tapak Raja Cave as a contextual Social Studies learning resource for strengthening students' environmental awareness and ecotheological values. This design was considered appropriate because the study did not aim to test causal effects, but rather to describe students' learning experiences, affective responses, cognitive understanding, value internalization, and reflective awareness after participating in a field-based learning activity. The quantitative data presented in percentages were used only to summarize patterns of student responses and to support qualitative interpretation, not to establish statistical generalization or treatment effectiveness (Creswell & Creswell, 2022; Snyder, 2019).

The participants of this study were 20 seventh-grade students of MTs Negeri 3 Penajam Paser Utara in the 2025/2026 academic year. The participants were selected purposively because they were studying Social Studies topics related to natural resources, human–environment interaction, local economic activities, and community life. Tapak Raja Cave, located in Wonosari Village, Sepaku District, Penajam Paser Utara Regency, was selected as the research site because it provides relevant natural, social, economic, and ecological features for contextual Social Studies learning. The study was conducted during the even semester from March to April 2026 through a structured field-learning activity involving classroom preparation, direct observation at the cave, guided exploration, student reflection, and follow-up discussion.

Data were collected through observation, student reflection sheets, semi-structured interviews, and documentation (Al Khansa et al., 2024; Pertiwi et al., 2025; Rokmana et al., 2025; Sufian et al., 2024; Waluyo et al., 2025). Observation was conducted to record students' participation, interaction, learning engagement, and responses during the field activity. The student reflection sheet was designed to capture five main components: affective responses, cognitive understanding, internalization of ecotheological values, evaluation of the learning process, and open-ended reflection. The affective component examined students' enjoyment, enthusiasm, and interest in learning Social Studies through the cave visit. The cognitive component explored students' ability to relate cave observations to Social Studies concepts, identify natural objects, and explain the relationship between conservation and community livelihoods. The value internalization component focused on students' recognition of religious awareness, mutual cooperation, leadership, tolerance, social justice, love of the homeland, harmony with nature, and perseverance. The open-ended reflection component allowed students to express meaningful experiences, new insights, religious reflection, and concrete actions for environmental conservation.

The learning procedure was implemented in several stages. First, the teacher introduced the learning objectives, explained the relevance of Tapak Raja Cave to Social Studies material, and provided guidance on field observation activities. Second, students visited Tapak Raja Cave under the supervision of the teacher and local guide. During the visit, students observed cave formations, bat habitats, environmental conditions, local tourism management, and economic activities around the

cave. Third, students completed observation tasks and reflection sheets based on their direct experiences. Fourth, the teacher facilitated a reflective discussion to help students connect their observations with Social Studies concepts, environmental conservation, local community welfare, and ecotheological values. Finally, the researcher organized and analyzed the collected data to identify patterns related to contextual learning, environmental awareness, and value internalization.

The qualitative data were analyzed using the interactive model of Miles, Huberman, and Saldaña, which consists of data condensation, data display, and conclusion drawing (Farquhar et al., 2020; Merriam & Tisdell, 2016; Morgan, 2024; Tommie Nathan McGee II, 2023; Vaismoradi et al., 2013). Data condensation was conducted by selecting, simplifying, and categorizing observation notes, interview information, documentation, and students' open-ended reflections. Data display was carried out by organizing the findings into descriptive narratives and summary tables to clarify patterns of affective responses, cognitive understanding, value internalization, learning process evaluation, and reflective awareness. Conclusion drawing was conducted by interpreting the relationship between students' field-learning experiences, Social Studies concepts, environmental awareness, and ecotheological values. Meanwhile, descriptive quantitative data from the reflection sheets were calculated in percentages to support the presentation of response tendencies.

To enhance the trustworthiness of the findings, data were compared across multiple sources, including observation records, student reflection sheets, interview information, and documentation. This triangulation was used to reduce reliance on a single data source and to ensure that the interpretation reflected students' actual learning experiences during the field activity. The researcher also reviewed the consistency between students' written responses, observed participation, and classroom discussion outcomes. Ethical considerations were addressed by conducting the study with school permission, ensuring that student participation was used only for educational and research purposes, and maintaining the confidentiality of student identities in reporting the findings. Thus, the methodological design provides a systematic basis for understanding how Tapak Raja Cave can be used as a contextual Social Studies learning resource to support environmental awareness and ecotheological value formation among madrasah students.

Result and Discussion

Students' Affective Responses to Cave-Based Social Studies Learning

The students' affective responses were examined to identify their emotional engagement during the contextual Social Studies learning activity at Tapak Raja Cave. Three indicators were used, namely students' enjoyment of the learning activity, their perception of cave-based learning compared with classroom learning, and their enthusiasm for learning Social Studies after the cave visit. The results are presented in Table 1.

Table 1. Students' Affective Responses to Cave-Based Social Studies Learning

No.	Statement	Strongly Agree + Agree	Disagree + Strongly Disagree	Positive Response
1	Learning at Tapak Raja Cave was enjoyable	20	0	100%
2	Learning at the cave was more enjoyable than classroom learning	19	1	95%
3	The cave visit made students more enthusiastic about learning Social Studies	18	2	90%

Table 1 shows that students generally demonstrated highly positive affective responses toward cave-based Social Studies learning. All students stated that learning at Tapak Raja Cave was enjoyable. In addition, 95% of students perceived cave-based learning as more enjoyable than classroom learning, while 90% reported greater enthusiasm for learning Social Studies after participating in the field activity. These findings indicate that Tapak Raja Cave provided a learning atmosphere that was positively received by students.

Students' Cognitive Understanding after the Cave Visit

Students' cognitive understanding was measured to determine their ability to connect direct observations at Tapak Raja Cave with Social Studies concepts. The indicators focused on students' ability to relate the cave visit to subject matter, identify objects in the cave, recognize learning objects beyond textbooks, explain the benefits of the cave for the local community, and understand the relationship between conservation and community livelihoods. The results are shown in Table 2.

Table 2. Students' Cognitive Understanding after Learning at Tapak Raja Cave

No.	Indicator	Number of "Yes" Responses	Percentage
1	Relating the cave visit to Social Studies material	20	100%
2	Mentioning at least three objects observed in the cave	20	100%
3	Identifying objects in the cave that were not found in textbooks	20	100%
4	Explaining the benefits of the cave for the local community	20	100%
5	Understanding the relationship between nature conservation and community livelihoods	20	100%

As presented in Table 2, all students were able to demonstrate basic cognitive understanding after participating in the cave-based learning activity. Each indicator reached 100%, showing that students could relate the cave visit to Social Studies material, identify natural objects in the cave, recognize learning resources beyond textbooks, explain the social and economic benefits of the cave for the local community, and describe the relationship between environmental conservation and community livelihoods.

Internalization of Ecotheological and Character Values

The study also examined students' ability to identify and explain values related to ecotheology, social responsibility, and character formation after participating in the cave-based learning activity. Eight values were measured: religious awareness, mutual cooperation, leadership, tolerance, social justice, love of the homeland, harmony with nature, and perseverance. The results are presented in Table 3.

Table 3. Internalization of Ecotheological and Character Values

No.	Value	Number of Students	Percentage
1	Religious awareness	20	100%
2	Mutual cooperation	19	95%
3	Leadership	18	90%
4	Tolerance	17	85%
5	Social justice	20	100%
6	Love of the homeland	20	100%
7	Harmony with nature	20	100%

8	Perseverance	20	100%
	Average		96.25%

Table 3 indicates that the average internalization of ecotheological and character values reached 96.25%. The highest percentages were found in religious awareness, social justice, love of the homeland, harmony with nature, and perseverance, each reaching 100%. Mutual cooperation reached 95%, leadership reached 90%, and tolerance reached 85%. These results show that most students were able to identify and explain the values embedded in the cave-based learning experience.

Students' Evaluation of the Learning Process

Students' evaluation of the learning process was analyzed to determine how they perceived the implementation of cave-based Social Studies learning. The evaluation covered three main aspects: student engagement, learning perception, and process effectiveness. The results are presented in Table 4.

Table 4. Students' Evaluation of the Cave-Based Learning Process

Aspect	Indicator	Positive Responses	Less Positive Responses	Percentage	Category
Engagement	Worksheet completion	19	1	95%	Very high
	Discussion with classmates	16	4	80%	High
Learning perception	Teacher's explanation	19	1	95%	Very high
	Guide's explanation	18	2	90%	Very high
	Observation time	18	2	90%	Very high
Process effectiveness	Visit planning	19	1	95%	Very high
	Teacher's guidance	19	1	95%	Very high
	Reflection activity	19	1	95%	Very high

The results in Table 4 show that students evaluated the learning process positively. The highest responses were found in worksheet completion, teacher's explanation, visit planning, teacher's guidance, and reflection activity, each reaching 95%. The guide's explanation and observation time each reached 90%. Discussion with classmates obtained the lowest percentage, at 80%, although it remained within the high category. Overall, the percentage of positive responses across the eight indicators reached 91.9%, indicating that students generally perceived the cave-based learning process as well-organized and meaningful.

Students' Open-Ended Reflections after Cave-Based Learning

Open-ended reflection was used to identify students' ability to articulate their learning experiences, new insights, environmental awareness, religious reflection, and proposed conservation actions. The results are shown in Table 5.

Table 5. Students' Open-Ended Reflections after Learning at Tapak Raja Cave

No.	Reflection Indicator	Number of "Yes" Responses	Percentage
1	Describing an impressive experience during cave-based learning	19	95%
2	Mentioning new experiences not obtained in classroom learning	19	95%
3	Explaining reasons for the importance of nature conservation	19	95%
4	Relating the cave visit to the greatness of God	19	95%
5	Mentioning concrete actions to conserve nature	18	90%
Average		18,8	94%

Table 5 shows that students' open-ended reflections reached an average of 94%. A total of 95% of students were able to describe impressive experiences, mention new experiences beyond classroom learning, explain the importance of nature conservation, and relate the cave visit to the greatness of God. In addition, 90% of students were able to mention concrete actions for conserving nature. These findings demonstrate that most students could express reflective responses after participating in the cave-based learning activity.

Overall, the results indicate that the use of Tapak Raja Cave as a contextual Social Studies learning resource generated positive outcomes across affective, cognitive, value-related, process, and reflective dimensions. Students showed high positive affective responses ranging from 90% to 100%, cognitive understanding reached 100%, internalization of ecotheological and character values reached 96.25%, learning process evaluation reached 91.9%, and open-ended reflection reached 94%. These findings provide empirical evidence that Tapak Raja Cave can be used as a relevant contextual learning site for connecting Social Studies concepts with environmental conservation, local community life, and ecotheological awareness.

Discussion

The findings of this study indicate that Tapak Raja Cave has strong pedagogical potential as a contextual Social Studies learning resource for strengthening students' environmental awareness and ecotheological values. The most prominent results show that students demonstrated highly positive affective responses toward cave-based learning, ranging from 90% to 100%; cognitive understanding reached 100%; internalization of ecotheological and character values reached 96.25%; students' evaluation of the learning process reached 91.9%; and open-ended reflection reached 94%. These results are directly related to the research objectives, namely to examine how Tapak Raja Cave supports students' environmental awareness, how students interpret concrete actions for environmental care, and how field-based Social Studies learning contributes to the internalization of ecotheological values. Although these findings should not be interpreted as causal evidence because the study did not employ a pre-test and post-test design, they suggest that direct learning experiences in local natural environments can create meaningful connections between Social Studies concepts, environmental conservation, local livelihoods, and religious values.

The findings are consistent with recent global studies emphasizing the educational value of outdoor and nature-based learning. Hu & Mou (2025) argue that outdoor education contributes to sustainable development education by connecting learners with real ecological contexts and promoting experiential understanding. Similarly, Mann et al. (2022) found that nature-specific outdoor learning supports children's academic, socio-emotional, and wellbeing outcomes when learning activities are intentionally designed and connected to curricular purposes. The present study confirms these arguments by showing that students responded positively to field-based Social Studies learning and were able to connect cave observations with natural resources, community livelihoods, and conservation issues. However, in contrast to some international studies that focus mainly on general outdoor education, science learning, or environmental literacy, this study positions a cave ecosystem as a Social Studies learning resource that simultaneously carries ecological, socio-economic, cultural, and spiritual meanings. This contextual specificity is important because students did not only observe nature but also interpreted the cave as part of local community life and religious responsibility.

The results also align with global studies on place-based education and environmental education. Örnek & Yel (2025) demonstrated that place-based teaching practices can improve students' environmental literacy by linking learning content with local environments. Ardoin et al. (2020) similarly emphasized that environmental education is more likely to generate conservation-related outcomes when it involves local natural areas, community needs, and hands-on activities. The present study extends these findings by showing that Tapak Raja Cave can function as a place-based learning site where students directly observe geological formations, cave ecosystems, local economic activities, and conservation needs. Nevertheless, the current study differs from meta-analytic evidence such as van de Wetering et al. (2022), which examined the broader effects of environmental education on knowledge, attitudes, intentions, and behavior across multiple contexts. Because this study used descriptive qualitative data supported by percentages, it can only demonstrate students' immediate responses and reflective awareness, not long-term behavioral change. This distinction is important to avoid overstating the effectiveness of the intervention.

In relation to Indonesian and local studies, the findings support previous research showing that contextual and ecopedagogical approaches can improve the relevance of Social Studies learning. Prasetya et al. (2020) reported that Contextual Teaching and Learning in Social Studies helps students connect learning materials with real-life situations, while Prasetya et al. (2022)found that ecopedagogical Social Studies learning can foster students' ecological awareness through the integration of classroom theory and practical environmental experiences. The present study is consistent with these findings because students were able to relate the cave visit to Social Studies material and understand the relationship between nature conservation and community livelihoods. However, this study contributes a more specific local dimension by using Tapak Raja Cave as a learning site in the Nusantara Capital City area. In this regard, the cave is not merely a natural object but also a socio-economic and cultural space associated with local tourism, community welfare, and environmental responsibility. DOI-verified Indonesian studies specifically examining cave-based Social Studies learning within the 2020–2026 period were not found in this verification; therefore, comparison is made with broader Indonesian studies on contextual Social Studies learning, ecopedagogy, and Islamic environmental education.

The findings further resonate with Indonesian studies on Islamic environmental education and ecotheology. Wakhidah & Erman (2022) showed that environmental education content has been incorporated into the Indonesian Islamic Religious Education curriculum, although its implementation still requires stronger integration with daily practices. Rohman et al. (2024) also emphasized that Islamic eco-theology can enrich environmental education by connecting ecological issues with religious and moral reasoning. In a similar direction, Taufikin (2025) found that eco-theology-based Islamic education can foster ecological awareness through religious pedagogy grounded in the concepts of *khilāfah*, *amānah*, and *mīzān*. The present study confirms these arguments in a Social Studies context by demonstrating that students were able to relate cave-based learning to religious awareness, harmony with nature, and concrete conservation actions. Unlike studies that discuss ecotheology mainly at the curriculum or institutional level, this study shows how ecotheological values can be internalized through direct field experience in a local natural site.

Theoretically, the findings support the assumptions of contextual learning, student engagement theory, and ecotheological education. From the perspective of contextual learning, the cave visit enabled students to construct meaning by linking Social Studies concepts with real

environmental and community phenomena. From the perspective of student engagement, the high affective responses and positive evaluation of the learning process indicate that local outdoor learning can stimulate emotional, behavioral, and cognitive engagement. From the perspective of ecotheology, the high internalization of religious awareness and harmony with nature suggests that environmental education can be strengthened when ecological responsibility is connected with spiritual meaning. Thus, this study extends existing theory by showing that contextual learning in Social Studies can function not only as a cognitive strategy but also as a value-based and faith-informed pedagogical approach. The theoretical refinement proposed by this study is that contextual Social Studies learning becomes more transformative when it integrates three dimensions simultaneously: direct environmental experience, socio-economic interpretation, and religious-ecological reflection.

Pedagogically, the findings suggest that teachers should design Social Studies learning activities that move beyond textbook explanation and involve structured observation, guided discussion, reflective writing, and value clarification in local environments. The relatively lower score for peer discussion indicates that future learning designs should provide more time and clearer procedures for collaborative inquiry. Teachers can develop worksheets that require students to identify natural objects, analyze their social and economic relevance, reflect on religious meanings, and propose conservation actions. In terms of policy, the findings are relevant to madrasah curriculum development and the Ministry of Religious Affairs' ecotheology agenda, which has been formally included in the 2025–2029 priority programs through KMA No. 244 of 2025. Schools and policymakers can use this model to develop local-potential-based Social Studies modules, strengthen field-based environmental education, and promote ecotheological habituation through school culture, community partnerships, and collaboration with local site managers. However, policy implementation should not reduce ecotheology to ceremonial activities; it should be integrated into curriculum planning, teacher training, assessment, and sustained environmental practices.

The novelty of this study lies in its integration of cave-based local learning, Social Studies pedagogy, environmental awareness, and Islamic ecotheology within a madrasah context near the Nusantara Capital City area. Previous studies have examined outdoor learning, place-based education, environmental literacy, ecopedagogy, and Islamic environmental education separately, but this study brings these strands together in one empirical setting. The contribution of this study is therefore twofold. First, it provides empirical evidence that a local cave ecosystem can be used as a multidimensional learning resource for Social Studies, linking natural resources, local economy, conservation, and community welfare. Second, it demonstrates that ecotheology can be translated into field-based learning practices, allowing students to interpret environmental care not only as civic responsibility but also as religious responsibility. This finding expands the literature by challenging the assumption that ecotheology is mainly a theological or curricular discourse; instead, it can become an experiential pedagogical framework for environmental character formation.

This study has several limitations that should be considered when interpreting the findings. First, the participants were limited to 20 seventh-grade students from one madrasah, which restricts the generalizability of the results. Second, the study used descriptive data and did not include a pre-test, post-test, or comparison group, so it cannot establish causal effects on students' environmental awareness or behavior. Third, some instruments used dichotomous response formats, which may limit the depth of measurement and increase the possibility of social desirability bias. Fourth, the

study measured immediate responses and reflections after the field activity but did not examine whether students' awareness developed into sustained environmental behavior. Future research should employ mixed-methods or quasi-experimental designs, involve larger and more diverse samples, use validated environmental awareness and ecotheology instruments, and conduct longitudinal observations to examine the long-term impact of cave-based contextual learning on students' ecological behavior, religious reflection, and community participation.

Conclusion

This study concludes that Tapak Raja Cave has strong potential as a contextual Social Studies learning resource for strengthening students' environmental awareness and ecotheological values. The findings show that cave-based learning generated high positive affective responses, supported students' cognitive understanding of natural resources and community livelihoods, facilitated the internalization of religious and ecological values, and encouraged meaningful student reflection on environmental conservation. Tapak Raja Cave functioned not only as a natural learning laboratory but also as a pedagogical space where students could connect Social Studies concepts with local economic activities, environmental responsibility, and religious meaning. The study contributes to Social Studies pedagogy by demonstrating that local natural sites can be used to integrate ecological, socio-economic, and spiritual dimensions in madrasah learning. However, the findings should be interpreted cautiously because the study involved a limited number of participants, used descriptive data, and did not measure long-term behavioral change. Future studies are recommended to involve broader samples, apply validated instruments, use pre-test and post-test designs, and conduct longitudinal observation to examine the sustained impact of ecotheology-based contextual learning on students' environmental behavior.

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