

The Correlation Between Medicinal Plant Knowledge and Students' Conservation Attitudes Using North Sumatera Medicinal Plants Ethnoscience e-Catalog

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Abstract

This study aimed to analyze the correlation between medicinal plant knowledge and students' conservation attitudes after using the North Sumatera Medicinal Plant Ethnoscience e-Catalog. The e-Catalog is accessed through Google Sites and contains information on the local and scientific names, morphology, benefits, habitat, and conservation values of medicinal plants in North Sumatera integrated with ethnoscience. This research is a quantitative correlational study. The research subjects numbered 33 science education students. Data were collected using a medicinal plant knowledge test and a conservation attitude questionnaire. Data analysis used descriptive statistics, the Shapiro-Wilk normality test, and Spearman's rho correlation. The results showed that the students' average medicinal plant knowledge was 70.52 and the average conservation attitude was 40.24. Spearman's correlation test produced a correlation coefficient of $\rho = 0.687$ with a significance value of $p = 0.000$ ($p < 0.01$), indicating a strong and statistically significant positive relationship between medicinal plant knowledge and students' conservation attitudes. The coefficient of determination value of 47.2% shows that medicinal plant knowledge provides a fairly large contribution to students' conservation attitudes. The results of this study indicate that the North Sumatera Medicinal Plant Ethnoscience e-Catalog has the potential to become an effective digital learning medium in supporting the strengthening of students' conservation attitudes through ethnoscience integration.

Keywords

e-Catalog; ethnoscience; medicinal plant knowledge; conservation attitude.



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INTRODUCTION

Indonesia has high biodiversity, including a wealth of medicinal plants that is used across generations by various ethnic groups as part of traditional knowledge (Febriyanti et al., 2026; Susanti & Zuhud, 2019). Medicinal plant knowledge (ethnobotanical knowledge) not only includes the ability to identify plant species, but also understanding of its benefits, habitat, cultivation, and conservation value. Such knowledge is part of local wisdom that plays an important role in supporting the conservation of biodiversity (Wahidah et al., 2025).

Modernization and the reduced interaction of the younger generation with the local environment cause medicinal plant knowledge to continue to decline. This condition potentially weakens concern for the preservation of medicinal plants and their ecosystems (Perbawasari et al., 2024). In the context of higher education, strengthening medicinal plant knowledge becomes important because it can enhance biodiversity literacy while building students' conservation awareness (Azizah & Rezha, 2026; Gonzales et al., 2026).

Conservation attitude is an individual's tendency to support environmental preservation through aspects of awareness, concern, and the tendency to act. Various studies show that environmental knowledge and ethnobotanical knowledge have a positive relationship with conservation attitudes and concern for the environment (Ayu et al., 2026). Students who understand the importance of medicinal plants as biological resources and cultural heritage tend to have a more positive orientation toward preservation efforts (Ichsan et al., 2019; Sari et al., 2024).

The ethnoscience approach is a relevant strategy for integrating local knowledge with scientific concepts through contextual learning. One medium that can support such learning is the North Sumatra Medicinal Plants Ethnoscience e-Catalog, which was developed using Google Sites and includes information on local names, scientific names, morphology, benefits, habitat, and the conservation value of medicinal plants in North Sumatra. Digital media like this enables students to access information flexibly and strengthens ethnobotany literacy based on local biodiversity (Asiandu & Sari, 2024; Gonzales et al., 2026).

Although research on ethnoscience and conservation has developed, studies that are specifically that specifically analyze the relationship between medicinal plant knowledge and students' conservation attitudes after using ethnoscience-based digital learning media are still relatively limited. Most studies focus on ethnobotanical documentation or the development of learning media, whereas the relationship between ethnobotany literacy and the formation of conservation attitudes has not been widely studied (Luzyawati & , Idah Hamidah, 2026; Mumpuni et al., 2013). Therefore, this study aims to analyze the correlation between medicinal plant knowledge and students' conservation attitudes in the use of the North Sumatra Medicinal Plants Ethnoscience e-Catalog.

METHODS

This research is a quantitative correlational study that aims to analyze the relationship between medicinal plant knowledge and students' conservation attitudes in the use of the North Sumatra Medicinal Plants Ethnoscience e-Catalog. The study was conducted in the even semester of the 2025/2026 academic year in the Science Education Study Program, FMIPA, Universitas Negeri Medan, with a total of 33 students selected using purposive sampling. Research instrument consists of a knowledge test of medicinal plants with 20 multiple-choice questions and a conservation attitude survey containing 12 statements using a four-point Likert scale. The questionnaire measures three dimensions of conservation attitude: awareness (cognitive), care (affective), and behavioral tendency (conative).

Data collection was carried out after students used the e-Catalog Etnosains accessed via Google Sites. Data were analyzed using SPSS. Descriptive statistics were used to describe means and standard deviations. Normality tests were conducted using Shapiro–Wilk. The correlation between medicinal plant knowledge and conservation attitude was analyzed using Spearman's rho correlation at a significance level of 0.05. The magnitude of the contribution of medicinal plant knowledge to conservation attitude was calculated using the coefficient of determination (R^2).

RESULTS AND DISCUSSION

Results

Descriptive Statistics

Descriptive statistical analysis aims to describe the level of knowledge about medicinal plants and students' conservation attitudes after using the e-Catalog Etnosains Tanaman Obat Sumatera Utara. The analysis results can be seen in Table 1.

Table 1. Descriptive statistics of the research variables

Variable	N	Minimum	Maximum	Mean	Standard deviation
Medicinal plant knowledge	33	61	79	70.52	5.501
Conservation attitude	33	30	48	40.24	4.272

Table 1 above shows the average medicinal plant knowledge of students, namely 70.52, and the average conservation attitude is 40.24. A standard deviation value smaller than the mean indicates that the data for both variables are relatively homogeneous.

Normality test

Normality tests were conducted using Shapiro–Wilk. The analysis results can be seen in Table 2.

Table 2. Shapiro–Wilk normality test results

Variable	Statistics	Sig.	Description
Knowledge of medicinal plants	0,926	0,028	Not normal
Conservation attitude	0,966	0,373	Normal

The normality test results in Table 2 show that the data on medicinal plant knowledge are not distributed normally ($p = 0.028$), while the conservation attitude data are normally distributed ($p = 0.373$). Therefore, correlation analysis was conducted using Spearman's rho correlation.

Correlatin between medicinal plant knowledge and conservation attitude

Spearman correlation test results are presented in Table 3.

Table 3. Results of Spearman correlation test

Variable	Coefficient correlation	Sig. (2-tailed)	R ²	Interpretation
Medicinal plant knowledge	0,687	0,000	0,472	Relationship
Conservation attitude			(47.2%)	strong positive

Based on Table 3, the Spearman correlation coefficient obtained is $\rho = 0.687$ with a value significance 0.000 ($p < 0.01$). This result indicates there is a strong and significant positive relationship between students' knowledge of medicinal plants and their conservation attitude, where the higher the medicinal plant knowledge of students, the higher the conservation attitude shown after using the e-Catalog Etnosains Tanaman Obat of North Sumatra.

The R² value of 0.472 (47.2%) shows that knowledge of medicinal plants provides a contribution of 47.2% to the variation in students' conservation attitudes, while the remaining 52.8% is influenced by other factors.

Discussion

The results show that there is a strong and significant positive relationship between knowledge of medicinal plants and students' conservation attitudes in the use of the North Sumatra Medicinal Plant Ethnoscience e-Catalog. The Spearman correlation coefficient of $\rho = 0.687$ indicates that an increase in students' knowledge of medicinal plants is followed by an increase in conservation attitudes. This finding shows that knowledge about identity, benefits, habitat, and conservation value of medicinal plants is closely related to students' awareness and concern for biodiversity conservation.

That correlation can be explained through the concept of ethnobotanical knowledge, namely community knowledge about the use and management of plants passed down through generations. Ethnobotanical knowledge is part of biodiversity literacy that not only enhances understanding of biological resources but also builds appreciation for the ecological and cultural value of a species (Pandey, 2017). Students who understand the importance of

medicinal plants as traditional medicine, cultural heritage, and components of biodiversity tend to have a more positive orientation toward conservation efforts. This finding is consistent with Luzyawati et al. (2026), who stated that ethnobotanical knowledge plays an important role in supporting biodiversity conservation through strengthening awareness of local resources.

The use of the North Sumatra Medicinal Plant Ethnoscience e-Catalog is suspected to be a factor that to strengthen the connection between knowledge and conservation attitudes. The e-Catalog presents information on local names, scientific names, morphology, benefits, habitat, and conservation value of medicinal plants within the local context of North Sumatra. The contextual presentation of materials enables students to connect scientific concepts with local knowledge, making learning more meaningful. The ethnoscience approach provides a learning experience close to students' environment and culture, thereby enhancing the relevance of learning and reinforcing awareness of the importance of medicinal plant conservation (Fadilah, 2026; Shukla, 2023).

The determinant coefficient value of 47.2% shows that almost half of the variation in attitude of conservation attitudes can be explained by knowledge of medicinal plants. This percentage indicates that knowledge of medicinal plants is one of the important factors in shaping conservation attitudes. Nevertheless, there remains 52.8% of variation influenced by other factors, such as learning experiences, cultural values, motivation, social environment, and student involvement in conservation activities. This result indicates that the formation of conservation attitudes is a multidimensional process not only influenced by cognitive aspects but also by affective factors and direct experience in interacting with the environment.

Analysis of the conservation attitude dimension shows that awareness (cognitive) receives the highest score highest, followed by concern (affective) and behavioral intention (conative). This pattern indicates that increases in medicinal plant knowledge are more quickly reflected in the awareness aspect than in behavior changes. Students have understood the importance of conserving medicinal plants, but the tendency to take conservation actions remains relatively lower. This finding is in line with Ichsan et al. (2019), who reported that knowledge about medicinal plants relates to positive attitudes toward conservation, but changes in conservation behavior require more applicable learning experiences.

From the perspective of conservation education, this study shows that the e-Catalog ethnoscience can be an effective digital learning media to enhance ethnobotanical literacy while strengthening students' conservation attitudes. Integrating scientific information with local wisdom enables students to understand that medicinal plants have ecological, pharmacological, and cultural values that are interconnected. Ethnoscience-based learning also supports the development of sustainable education by strengthening biodiversity literacy and responsibility to the environment. Therefore, the use of the ethnoscience e-Catalog not only serves as a media information, but also as a means of internalizing conservation values based on local biodiversity wealth.

Nevertheless, this study has limitations. The correlational design only shows a

relationship between knowledge of medicinal plants and conservation attitudes, thus it cannot explain causal relationships. In addition, the relatively small sample size and being from a single study program limit the generalizability of the research results. Future research is recommended to use experimental or quasi-experimental designs with a larger sample and to involve direct measurement of conservation behavior so that the mechanism of e-Catalog Ethno-science influence on the formation of attitudes and conservation behavior can be understood more comprehensively.

CONCLUSION

The results show a strong and significant positive relationship between knowledge of medicinal plants and conservation attitudes among students after using the e-Catalog Ethno-science of Sumatra herbal plants. The higher students' knowledge about identification, benefits, habitat, and conservation value of medicinal plants, the more positive the conservation attitude demonstrated. Knowledge of medicinal plants contributes significantly to shaping students' conservation attitudes, thus it can be used as one factor in strengthening awareness, concern, and tendency toward conservation actions. Therefore, it can be concluded that the e-Catalog Ethno-science of Sumatra Herbal Plants has the potential to be an effective digital learning media based on ethnoscience to support the enhancement of students' knowledge of herbal conservation and simultaneously strengthen students' conservation attitudes through the integration of ethnoscience.

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