

## Bridging Ethnobotany and Islam: Measuring the Feasibility and Practicality of an Ethnobotany Textbook Integrated with Islamic Values

Lia Angela\*, Muhammad Aflian

Institut Agama Islam Negeri Kerinci

Jalan Kapten Muradi Sumur Gedang, Desa Sungai Liuk, Kec. Pesisir Bukit, Kota Sungai Penuh

\*Corresponding author: [liaangelic88@gmail.com](mailto:liaangelic88@gmail.com)

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### ABSTRACT

This study aims to analyze the quality and feasibility of an ethnobotany textbook integrated with Islamic science as an alternative learning resource for students in the Biology Education Study Program. The textbook was developed using the ADDIE model. The developed textbook underwent validation by three experts: a material expert, with a score of 95%; a design expert, with a score of 85,6%; and a language expert, with a score of 93,3%. Practical testing conducted by students and lecturers resulted in an average score of 85.6%, categorizing the textbook as highly practical. The findings indicate that the textbook is both effective and practical to utilize in the learning process. Key strengths of the textbook include its alignment with the lesson plan/course profile and the seamless integration of Islamic science into each section of the textbook.

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## INTRODUCTION

Ethnobotany is a discipline that scrutinizes the relationship between humans and plants within cultural, social, and economic contexts (Walujo, 2011; Wijaya, I. & Oktarina, 2014). At a global level, ethnobotany plays a crucial role in utilization of plants for the biodiversity conservation and local wisdom in (Hakim, 2014). In various parts of the world, indigenous communities have long used plants for medicinal purposes, food, and religious rituals, which now serve as significant sources of knowledge for the development of modern medicines (Leonti et al., 2024).

In Indonesia, as a megadiverse country, the utilization of plants in daily life is highly diverse and holds significant cultural value (Wahyuni, 2020). Various indigenous communities, such as the Baduy, Dayak, and Samin, possess ethnobotany that has been passed down through generations (Efremila., 2020). However, modernization and lifestyle changes have led to a decline in this

knowledge, making it less recognized by the younger generation (Muhammad, 2021). Therefore, the incorporation of ethnobotany into education becomes a strategic solution to preserve and develop the local values.

Ethnobotanical education can enhance students' ecological awareness and understanding toward the interconnections among plants, society, and culture (Suja, 2022). In various countries, such as Indonesia the integration of ethnobotany into the curriculum has an effective impact in improving environmental literacy and supporting STEM (Science, Technology, Engineering, and Mathematics) (Muttaqin, 2023). However, In the Indonesian context, ethnobotanical education has not received adequate attention in the formal curriculum (Adriadi et al., 2022).

One of the main challenges in ethnobotanical education is the limited availability of the appropriate teaching materials for local cultural and environmental contexts. Most textbooks refer to general sources without accommodating local wisdom. Therefore, the development of ethnobotanical textbook based on local culture is essential to improve the effectiveness of learning and support the sustainability of ethnobotany in education (Setyawan et al., 2021).

Islam emphasizes the importance of maintaining ecological balance and respecting all of God's creatures. The concept of *khalifah fil ardh* in Islam highlights that humans have a responsibility to preserve and wisely utilize natural resources (Kholil, 2024). Ethnobotany, with the integration of Islamic values, can assist students understand of Islamic views on the use of plants for life's needs, encompassing aspects of *halal-haram*, environmental conservation, and social welfare (Handayani et al., 2021).

Several studies indicate that biology teaching based on Islamic values can enhance students' understanding of the relationship between science and religion (Jaswan & Tobroni, 2024). However, there is still a limited number of studies focused on the implementation of Islamic values in ethnobotanical teaching materials. Previous research has developed ethnobotanical materials based on local culture, but few have systematically integrated Islamic values (Ilhami et al., 2021; Adriadi et al., 2022). Earlier studies have primarily focused on the utilization of plants within communities without a broader Islamic perspective. Therefore, this study aims to develop ethnobotanical teaching materials that are not only scientifically and culturally based but also contain relevant and applicable Islamic values. The integration of Islamic values in ethnobotany textbooks makes this research different from previous research studies.

This study offers a contribution by developing an ethnobotanical textbook that integrates Islamic values into each concept discussed. This textbook is expected to serve as a relevant learning

resource for students in Islamic higher education context and enhance ecological awareness based on values. This study not only contributes to the fields of biology and ethnobotany education but also supports the ongoing efforts of the Islamization of knowledge in Islamic higher education. In this study, the focus of the investigation is directed toward the feasibility and practicality of the developed textbook, as these two aspects are the main indicators for determining the quality and acceptability of an educational product before it is widely implemented. Feasibility relates to the extent to which the textbook meets standards of content, presentation, language, and the integration of Islamic values, while practicality measures how easily the textbook can be used by teachers and students in actual learning situations.

## RESEARCH METHODS

This research is a development study aimed at designing, validating, and analyzing the practicality of an ethnobotany textbook integrated with Islamic values. Research and Development (R&D) was employed which focuses on the processes of design, development, and evaluation of learning products (Gall, M., Gall, J., & Borg, 2007). According to Borg and Gall (1983), in research and development (R&D) studies, a feasibility test is necessary to ensure that the developed product meets user needs and academic standards before being applied in practice. In addition, practicality becomes crucial because a good product is not only valid but also practical for use by the target users (Darmono et al., 2024). This means that even if a textbook is theoretically well-designed, it is still ineffective if, in practice, it is difficult to use or does not fit the users' context.

The development model applied in this study is the ADDIE model (Analyze, Design, Develop, Implement, Evaluate) which uses a systematic approach to design, develop, and assess the effectiveness of a learning product. The analysis stage is the stage to analyze student needs in ethnobotany learning which includes curriculum analysis, material analysis and student needs analysis. The design stage begins with designing a textbook based on the results of the analysis stage, at this stage each material is designed with Islamic values that are in accordance with the ethnobotany material of each chapter in the textbook being developed. The development stage is the stage to analyze the feasibility of the textbook being developed by conducting validity tests and textbook trials. The implementation stage is the stage to analyze the feasibility of the book with large-scale trials so that the textbook can be used in learning as teaching materials. The last stage of the ADDIE model is the evaluation stage, namely the stage to analyze the feasibility, practicality and effectiveness of the textbook being developed by conducting effectiveness tests on the textbook.

Validation of the textbook was conducted by three experts using an adapted validation sheet instrument from the National Education Standards Agency (BNSP, 2014). The assessment covers four aspects including content/material, media/ presentation, and language (Fraenkel, J. R., Wallen, N. E., & Hyun, 2012). The assessment of the content aspect considers the relevance of the material to the Course Learning Outcomes (CLO/CPMK), the accuracy of ethnobotanical concepts, the novelty of information, the integration with Islamic values, and the relevance of the material. The media aspect is evaluated based on the format size of the textbook, cover design, and content design. In the language aspect, the evaluation includes criteria for writing and linguistic accuracy.

The textbook practicality evaluation involves both lecturers and students. The practicality assessment by lecturers was conducted by a lecturer who teaches the ethnobotany course in the Biology Education Program at IAIN Kerinci. The practicality assessment by students was carried out through a small-scale test involving 15 fourth-semester biology education students. The data obtained from validation and practicality assessments were analyzed using qualitative and quantitative descriptive approaches. The qualitative descriptive approach was used to summarize suggestions and recommendations from experts regarding the shortcomings and development of the textbook, such as suggestions on terminology usage or addition of illustrations. Meanwhile, quantitative analysis was performed by calculating the average scores from the validation sheets using a Likert scale of 1–4, which were then converted into percentages to determine the validity level of the textbook. Validity scores were categorized into four levels: very valid (81–100%), valid (61–80%), fairly valid (41–60%), and invalid (<40%) (Creswell, 2019). The practicality scores were categorized into four levels: very practical (76–100%), practical (52–75%), fairly practical (26–50%), and impractical (0–25%) (Isma, et al., 2023)

To ensure the accuracy of the assessments, the experts involved possess competencies relevant to their fields. Language experts are academics in linguistics or language teaching with over five years of experience. Content experts are ethnobotany lecturers and religious studies lecturers with more than seven years of experience and have published scientific works related to ethnobotany and religion. Media experts are graphic design practitioners with a minimum of five years of experience in developing print and digital learning media. These criteria ensure that the validation of the textbook is conducted comprehensively and credibly.

The results of this validation serve as a reference for improving the textbook, ensuring that the final product fulfills the academic standards and meet the learning needs at the higher education level.

## RESEARCH RESULT

The purpose of the validation test is to assess the validity, feasibility and practical use of textbook integrated with Islamic values. Feasibility test involves content, media, and language experts. Meanwhile, for practicality tests, teachers and students were employed. The results of the validation are shown in the following tables.

**Tabel 1.** The result of content feasibility

Indicators	Percentage	Criteria
Content appropriateness	98%	Very Valid
Content arrangement	90%	Very Valid
Content novelty	96%	Very Valid
The integration of Islamic value	96%	Very Valid
<b>Average</b>	<b>95%</b>	<b>Very Valid</b>

Based on the validation results from media experts, an average percentage of 95% was obtained, categorized as very valid, leading to the conclusion that the teaching materials can be piloted with students during the learning process.

The validation by media experts aims to validate the design layout of the developed textbook. Suggestions from the validators include improving the title on the cover of the textbook, which is still ambiguous, and correcting the identity details on the cover that are not accurate. The cover is a part that describes the content of the textbook, so the wording on the cover must be precise to ensure that readers, especially students, do not become confused about the textbook's purposes, thereby generating the reading interest. The results of the validation by media experts are presented in Table 2.

**Table 2.** The result of media feasibility

Indicators	Percentage	Criteria
Textbook format size	100%	Very Valid
Cover design	87,5%	Very Valid
Content design	100%	Very Valid
<b>Average</b>	<b>95,8%</b>	<b>Very Valid</b>

Based on the results of media expert validation, an average percentage of 95% was obtained, categorized as highly valid. It can therefore be concluded that the textbook is feasible to be piloted with students during the instructional process. The purpose of the language validation is to analyze

the linguistic accuracy used in the textbook. The results of the language expert validation are presented in Table 3.

**Table 3.** The results of language feasibility

Indicators	Percentage	Criteria
Writing Criteria	100%	Very Valid
Linguistics component	98%	Very Valid
Grammar	95%	Very Valid
<b>Average</b>	<b>97,6%</b>	<b>Very Valid</b>

Based on Table 3, the validation results from language experts yielded an average percentage of 97.6%, categorized as very valid, indicating that the textbook integrated with Islamic values is linguistically suitable for use as teaching material in the learning process. Subsequently, a practicality assessment was conducted to students and lecturers who utilized the teaching materials during the ethnobotany learning process. The results of the practicality assessment by lecturers are presented in Table 4, and by students are presented in Table 5.

**Table 4.** Practicality evaluation results (lecturer)

Indicators	Percentage	Criteria
Presentation	87.5%	Very practical
Attractiveness	82,5%	Very practical
Ease of use	87.5%	Very practical
Design	85%	Very practical
<b>Average</b>	<b>85,6%</b>	<b>Very practical</b>

**Tabel 5.** Practicality evaluation results (students)

Indicators	Percentage	Criteria
Design	95%	Very practical
Content presentation	90%	Very practical
Advantages	95%	Very practical
<b>Average</b>	<b>93,3%</b>	<b>Very practical</b>

The results of the practicality evaluation by lecturers and students indicate that the textbook has an average practicality percentage of 85.6% and 93.3%, which fall into the category of very practical, thus making the textbook as a reference in the learning process. This stage is based on student responses during small group testing, where 15 students were categorized as very practical. The final product of this study is the textbook that has been integrated with Islamic values.

## DISCUSSION

The textbook was developed by integrating Islamic values into each chapter. This aims to align the concepts of ethnobotany with Islamic values, enabling students to obtain comprehensive information regarding ethnobotany studies and Islamic concepts. The integration of Islamic values



in ethnobotany textbook has a positive impact, contributing to the shaping of individuals morals and the ability to apply knowledge and skills with Islamic principles (Sapti et al., 2019; Leroch et al., 2012).

The validation stage of this textbook is the first phase of the development process aimed at assessing the validity of the textbook being developed. The validity of this textbook is evaluated by experts in their respective fields, namely content and design experts. According to Handayani et al., (2021), validation of teaching materials is necessary to ensure that the content aligns with the needs of businesses or industries, thus affirming that the materials are suitable and appropriate for use in the learning process. Furthermore, states that the validity of a product developed can be determined based on the results of the validation activities. The textbook validation is assessed by experts who have mastery in their respective fields, using categories of evaluation: (1) not valid, (2) less valid, (3) valid, and (4) very valid. Oktaviana & Susiaty, (2020) asserts that validity is considered good when the validity coefficient falls between valid and very valid. The results of the development of this textbook are declared valid by content validators since the textbook meets the evaluation aspects, namely feasibility, content, and presentation. The materials are presented in a systematic order, making them easy for students to understand.

The validation results from content experts indicate that the textbook is valid since it encompasses several aspects, including relevance, accuracy, novelty and sequence of the material, as well as the integration of Islamic values. The relevance of the material refers to how well the content of the textbook aligns with the learning objectives and the curriculum. Materials must meet the needs of learners and correspond to the basic competencies intended to be achieved. In the context of ethnobotany, the material should include local knowledge about the utilization of plants and its relevance to daily life. The integration of Islamic values within the ethnobotanical content must also adhere to Islamic principles that support environmental preservation and the wise use of resources (Hidayah et al., 2023). This aligns with the view that local wisdom-based education and religious values can enhance students' understanding and appreciation of the environment (Suttrisno & Rofi'ah, 2023).

The accuracy of the material is a critical aspect in the development of textbooks. The content presented must be based on reliable sources and have undergone verification by experts. Research by Uriyah et al., (2018) shows that inaccuracies in material can lead to misconceptions and diminish the effectiveness of learning. In the context of ethnobotany, accurate information about plant species, their benefits, and methods of utilization must be supported by the latest scientific

research. Additionally, the integration of Islamic values should be based on authentic sources such as the Qur'an, Hadith, and relevant Islamic literature (Halifah & Frazila, 2024).

The novelty of the textbook is essential to ensure that the teaching materials remain relevant to advancements in science and technology. According to Rahmawati, D. & Sriyati (2024), outdated materials can cause learners to miss out on the latest information. In the field of ethnobotany, new findings regarding the utilization of plants and environmental conservation should be integrated into the teaching materials. Furthermore, the integrated Islamic values should reflect a contemporary understanding of the relationship between humans, nature, and religion (Mappasessu & Thalib, 2024).

The integration of Islamic values in ethnobotanical textbook aims to connect scientific knowledge with Islamic principles. According to (Eliza, 2019), the integration of religious values in learning can enhance students' motivation and understanding. In the context of ethnobotany, values such as environmental preservation, social responsibility, and ethical resource utilization can be linked to Islam. For instance, the concept of "khalifah" in Islam emphasizes human responsibility to care for and wisely utilize nature (S. Huda, 2024). This integration not only enriches the textbook but also shapes the character of students to be environmentally aware and religious.

The validation results from media experts cover aspects such as textbook format, cover design, and content design are declared very valid with an average percentage of 95.8%. According to Kurniawati, (2019), the appearance of textbook plays a role in enhancing student motivation to study the content; teaching materials are deemed valid if their appearance encompasses several aspects such as format, layout, systematics, attractiveness, and language.

The textbook format is an important aspect that affects the use of teaching materials by students and lecturers. According to Li & Wang, (2024), a good textbook format should consider the practical aspects such as size, thickness, and layout that facilitate readers. The ethnobotanical textbook utilizes a concise yet comprehensive format, with a suitable size for carrying and using in various learning situations. Additionally, the use of organized columns, images, and diagrams can enhance readability and understanding of the material (Gunay, 2024). The textbook format should also allow for multimedia integration, such as QR code linking to videos or additional resources, to enrich the learning experience (S. Huda, 2024).

The cover design of the textbook plays a crucial role in attracting readers' interest and visually reflects the textbook's content. According to Li & Wang (2024), an effective cover design must



combine aesthetic elements with relevant information. For ethnobotanical textbook that integrate Islamic values, the cover design can incorporate images of local plants relevant to ethnobotany, as well as Islamic symbols such as calligraphy or geometric ornaments that reflect Islamic values. Furthermore, the colors used should also be chosen carefully, as colors can influence readers' perceptions and emotions (Ardi et al., 2024). An appealing cover design not only enhances visual appeal but also creates a professional and high-quality impression (Yilmaz, 2022).

The content design of the textbook includes layout, typography, image use, and visual consistency within the textbook. According to Chen, H. T., & Li, (2017) good content design must ensure a balance between text and visual elements, using readable fonts and appropriate sizes. For ethnobotanical textbook, content design includes illustrations or photos of plants, process diagrams, and location maps relevant to the material. The integration of Islamic values can be demonstrated through quotations from relevant verses of the Qur'an or Hadith, as well as informational boxes explaining the relationship between ethnobotanical material and Islamic principles (Dahirin & Rusmin, 2024). Furthermore, the use of consistent colors and icons can help readers identify important sections within the textbook (Yeh & Yi-Chia Cheng, 2010).

The results of the language feasibility assessment from language experts yielded an average score of 97.6%, categorized as very valid. The language feasibility assessment includes aspects of writing criteria, language use, and the application of the Indonesian standardized Spelling (EYD) in the textbook. The writing criteria refer to the structure and organization of the text used in the textbook. According to Anderson & Arsenault (1998), materials must have a logical and systematic writing flow, making it easier for readers to understand the content. Writing should begin with an introduction that explains the background and learning objectives, followed by a structured discussion of the material, and concludes with a summary or conclusion (Rianti et al., 2022). Furthermore, the use of subheadings and key points can assist readers more easily identify essential information (Wilson et al., 2024). The integration of Islamic values in writing is done naturally, by incorporating relevant verses from the Qur'an or Hadith in the context of the discussion (Muslim, 2018).

The language aspect encompasses word choice, sentence structure, and the style of language used in the textbook. According to Sapti et al., (2019), the language used in textbooks must align with the comprehension level of the readers, in this case, students. Complicated language can hinder understanding, while overly simplistic language can diminish the academic quality of the textbook (Turner et al., 2022). In ethnobotany textbooks, botanical terms are explained with clear

definitions and relevant examples. Additionally, the language style used is informative yet engaging, motivating students to continue reading (Chan et al., 2018). The integration of Islamic values is conducted with respectful language to cultural and religious diversity (Safitri et al., 2023).

The use of Indonesian standardized spelling (EYD) is an important aspect in textbook writing. According to Rajagukguk et al., (2024), spelling and grammatical errors can undermine the credibility of textbooks and disrupt readers' understanding. The ethnobotany textbook utilizes EYD, which includes the correct spelling of standard words, appropriate punctuation, and the correct writing of terms according to Indonesian language rules (Heristyo et al., 2024). The writing of verses from the Qur'an or Hadith follows correct writing conventions, including the use of quotation marks and accurate transliteration (Hidayat, 2024). Consistency in the use of EYD not only enhances the quality of the textbook but also demonstrates the professionalism of the author (Kwangmuang et al., 2021).

The results of the practicality assessment by lecturers yielded an average score of 97.6%, categorized as highly practical. The lecturers' practicality assessment encompassed aspects such as presentation, attractiveness, ease of use, and instructional material design. Presentation refers to the ability of the textbook to convey information effectively and efficiently without compromising the depth of the content. According to De Witte & López-Torres, (2017), efficient instructional materials should harmoniously integrate text, images, and diagrams to facilitate quick and in-depth understanding. The ethnobotany textbook were designed to minimize confusion and maximize information retention. The use of comparison tables on plant benefits or flowcharts on natural resource utilization can help students grasp complex concepts more easily (Qasserras, 2024). The integration of Islamic values is presented contextually, incorporating relevant Quranic verses or Hadiths within scientific discussions (Schreiber et al., 2024).

The attractiveness of the instructional materials relates to their ability to motivate students. According to Weinert et al., (2024), visually and content-wise appealing instructional materials can enhance learner engagement in the learning process. In ethnobotany textbooks, attractiveness can be enhanced with colored images, creative illustrations, and case studies relevant to everyday life. Displaying photos of rare plants or traditional plant utilization practices can make the content more vivid and engaging (Shabiralyani et al., 2015). The integration of Islamic values adds its own appeal, especially when presented in an inspirational and modern context (Hidayat, 2024).

Ease of use of textbook includes aspects of navigation, readability, and alignment with user needs. According to (Molina et al., 2022), the user-friendly textbook should have a clear structure,

detailed instructions, and a consistent format. The Ethnobotany textbook achieves ease of use through the inclusion of indexes, glossaries, and term lists to assist the learners access the information (Rofi'i et al., 2022). The textbook was designed to be usable in various learning settings, whether in-class or self-directed. The integration of Islamic values is presented in an easily understandable manner, with brief explanations of the relevance of the cited Quranic verses or Hadiths (Ardi et al., 2024).

The design of the textbook includes layout, typography, and the use of visual elements that support learning. According to Evans et al., (2010), textbook design should balance aesthetics and functionality. Ethnobotany textbook was designed with readable fonts, adequate spacing, and non-distracting colors. Visual elements such as images, diagrams, and icons are used strategically to clarify the content (Tomita, 2015). The integration of Islamic values in the design is achieved by using appropriate Islamic ornaments that align with the textbook's theme without compromising readability (Basoeki & Mingchang, 2021).

Furthermore, the results of the practicality assessment by Biology education's students yielded an average score of 93.3%, categorized as highly practical. The students' practicality assessment covered aspects such as design, material presentation, and the benefits derived from using the ethnobotany textbook integrated with Islamic values during the learning process. The design of the instructional materials includes visual design, layout, and the use of attractive graphic elements. According to Huda et al., (2024), a well-designed textbook can enhance learners' interest and motivation in using it. The developed ethnobotany textbook feature a design that reflects natural and Islamic themes, such as the use of natural colors like green and brown, as well as Islamic ornaments like calligraphy or geometric patterns (Moslimany et al., 2024). The use of high-quality images, informative diagrams, and consistent icons makes the content more engaging (Shabiralyani et al., 2015). The integration of Islamic values in the textbook design is harmoniously executed (Alashari, 2024).

Material presentation relates to how information is organized and conveyed in the textbook. According to Panjwani et al., (2010), effective material presentation should ensure logical flow, clear language, and adequate visual support. In the ethnobotany textbook, the content is systematically organized, starting from basic ethnobotany concepts, plant utilization, to the integration of relevant Islamic values (Asigbaase et al., 2023). The use of case studies and reflective questions assists the students relate the content to everyday life (Qasserras, 2024).

The developed ethnobotany textbook provides significant benefits to students in understanding ethnobotany concepts. The benefits can be observed in how the textbook assist students comprehend the relationship among humans, plants, and the environment, while integrating Islamic values into practical life (Moslimany et al., 2024). The benefits of the textbook refer to their contribution to achieving learning objectives and enhancing students' understanding. Beneficial instructional materials should meet students' academic needs, support skill development, and provide new insights (Meitiyani et al., 2022).

Limitations of this study include the small-scale practicality testing, which involved only students and a lecturer from a single class and institution. This limits the generalizability of the findings to broader contexts, such as implementation across multiple universities or schools with diverse cultural and geographical backgrounds. Moreover, the study focused solely on aspects of feasibility and practicality, while the effectiveness of the textbook in enhancing students' learning outcomes, ecological attitudes, and religious values has not been empirically tested. It is recommended that future research empirically examine the effectiveness of the textbook in improving students' academic performance and their attitudes toward environmental conservation and Islamic values.

## CONCLUSION

The development of the ethnobotany textbook integrated with Islamic values has proven to be highly feasible and practical. The validation results from content, media, and language experts yielded very high scores, indicating that the textbook meets academic standards in terms of material relevance, presentation, linguistic accuracy, and integration of Islamic principles. Moreover, the practicality evaluations by lecturers and students also showed very high percentages, confirming that the textbook is easy to use, attractive, and beneficial for the learning process. The integration of Islamic values throughout the textbook not only enriches the scientific content but also fosters students' environmental awareness and religious character. Thus, the developed textbook serves as an effective alternative learning resource for students in biology education programs, particularly within Islamic higher education institutions.

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