Practice of the Science of Teaching Journal: Jurnal Praktisi Pendidikan
E-ISSN 2830-568X | https://jurnal.hafecs.id/index.php/hafecspost/index
Volume 3 Issue 1, April 2024, pp. 1-6
DOI: https://doi.org/10.58362/hafecspost.v3i1.48

Validity of the family Anacardiaceae encyclopedia book: A development research

Validasi buku ensiklopedia famili Anacardiaceae: Sebuah penelitian pengembangan

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Abstract
Learning using encyclopedia books based on the potential of an area is one solution used to overcome problems that often arise in biology learning, one of which is students' low critical thinking ability. Developing an encyclopedia book in the Coastal Forest Area of Tabanio Village is an example of how 21st-century learning emphasizes the importance of an environmental perspective in learning. This strategy combines the idea of working locally while thinking globally. An encyclopedia is an educational resource that uses text and images to explain a subject. This research aims to verify the encyclopedia of the Anacardiaceae family, which may be found in the Coastal Forest of Tabanio Village. This research uses the Tessmer formative assessment design combined with Educational Design Research (EDR). Some validated components are coherence, readability, redundant vocabulary, active and passive sentences, value protection, applicability, and device implications. Encyclopedia experts researched three experts from the Biology Education study program at Lambung Mangkurat University. This research focuses on the Anacardiaceae family encyclopedia. The findings of this research demonstrate the validity (feasibility) of the encyclopedia of the Anacardiaceae family in the Coastal Forest of Tabanio Village. Therefore, this encyclopedia book can be used as an alternative learning resource and can be used to help improve students' critical thinking.

Keyword: encyclopedia; Anacardiaceae family; development research; validity

Abstrak. *Pembelajaran dengan menggunakan buku ensiklopedia berdasarkan potensi yang dimiliki sebuah daerah merupakan salah satu solusi yang digunakan untuk mengatasi permasalahan-permasalahan yang sering muncul pada pembelajaran biologi salah satunya rendahnya kemampuan berpikir kritis mahasiswa. Pengembangan buku ensiklopedia di Kawasan Hutan Pesisir Desa Tabanio merupakan contoh bagaimana pembelajaran abad 21 menekankan pentingnya perspektif lingkungan dalam pembelajaran. Strategi ini menggabungkan gagasan bekerja secara lokal sambil berpikir secara global. Ensiklopedia adalah sejenis sumber pendidikan yang menggunakan teks dan gambar untuk menjelaskan suatu subjek. Penelitian ini bertujuan untuk memverifikasi ensiklopedia famili Anacardiaceae yang mungkin ditemukan di Hutan Pesisir Desa Tabanio. Penelitian ini menggunakan desain penilaian formatif Tessmer yang dipadukan dengan Educational Design Research (EDR). Koherensi, keterbacaan, kosakata yang berlebihan, kalimat aktif dan pasif, perlindungan nilai, penerapan, dan implikasi perangkat merupakan beberapa komponen yang divalidasi. Pakar ensiklopedia meneliti tiga orang ahli program studi Pendidikan Biologi Universitas Lambung Mangkurat. Penelitian ini fokus pada ensiklopedia famili Anacardiaceae. Temuan penelitian ini menunjukkan validitas (kelayakan) ensiklopedia famili Anacardiaceae di Hutan Pantai Desa Tabanio. Oleh karena itu, buku ensiklopedia ini dapat dijadikan salah satu alternatif sumber belajar dan dapat dimanfaatkan untuk membantu meningkatkan mahasiswa dalam berpikir kritis. Kata kunci: ensiklopedia; famili Anacardiaceae; penelitian pengembangan; validitas.*

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INTRODUCTION

One way to help a person acquire the skills and character traits necessary to progress through all the stages of becoming a fully realized human being is through education. These stages include guidance, instruction, training, and environmental contact (Ritonga et al., 2022). The strategy to ensure a smooth learning process is to use and create learning resources that are appropriate to the level of education and are deliberately arranged to assist the learning process. A good learning process must connect teachers, students, learning models, concept learning strategies, media, and learning evaluations through the learning environment (Irianti & Mahrudin, 2021).

According to Putrawangsa (2018) and Mesra (2023), learning resources are one type of educational intervention that can be designed, developed, improved, and evaluated through systematic studies known as development research. Learning resources can be created gradually, methodically, and effectively to advance the collection of learning materials (Ritonga et al., 2022). The tests include self-evaluation, expert, individual, and small group tests to make learning resources. The stages of Tessmer's Formative Evaluation Model are represented in this stage, and the encyclopedia is one of the learning resources that can be created. The development of this learning media is due to students needing teaching material to facilitate the learning process (Irianti et al., 2022).

An encyclopedia is a literary work that combines descriptive text with visual aids, such as pictures or illustrations, to arouse students' curiosity about the subject matter and serve as a valuable source of new information based on the studies it discusses (Nurdiansyah et al., 2021). Based on this, a high-level plant encyclopedia was made, which contains botanical details on identifying or classifying various species by looking at the morphological characteristics of plants in the Anacardiaceae family (Ita et al., 2022). The foundation for the growth of the encyclopedia is the interaction of individuals with their environment using concrete media to produce changes in knowledge and behavior (Nurhadi, 2020). Thinking globally and acting locally increases global awareness while respecting local wisdom unique to each place (Sari, 2023).

Akmalia (2021) argues that developing teaching materials is the process of creating new items or improving existing products that are accounted for to improve teaching standards. This research was conducted using the EDR formative evaluation method of the Tessmer model. Zaini (2019) states that EDR tests students' critical thinking skills. Based on this statement, scientists will expand the variety of available products and create an encyclopedia of plant data results.

This research complements previous research on the Anacardiaceae family at Banua Botanical Garden. So, there has been no research in the Tabanio coastal forest area with the Anacardiaceae family in developing previous encyclopedia books. Tabanio Beach Forest consists of a wide variety of diverse flora and fauna. Putri et al. (2019) state that Tabanio Beach Forest is between Tabanio village and Pagatan Besar. Coastal forests are a component of marine and coastal ecosystems, which offer a variety of natural resources for tourism, education, food production, and recreation. This forest area is home to various plants and animals, and one of the many plant families found is from the Anacardiaceae family.

The Anacardiaceae family is found in dry to moist habitats, mostly in lowlands and tropical and subtropical regions, and extends to temperate zones. The Anacardiaceae family is one of the families of flowering plants (Magnoliophyta) included in the genus Sapindales, and this genus is characterized by shrub or tree habitats with bark containing resins that, when exposed to the skin, can cause inflammation (Steenis, 2013). The Anacardiaceae family is rarely used as a learning resource, especially locally based, so it is necessary to develop teaching materials for students to recognize the Anacardiaceae family found in the surrounding environment. The requirements for making good teaching materials must be assessed based on their feasibility. Testing the validity of the format, language, content, and presentation of teaching materials and their advantages or usefulness is one way to determine whether the material is suitable for use in the classroom.

Determining the validity of a learning device is based on a comparison between its validity requirements and the score obtained from the assessment (Widoyoko, 2017). Based on the existing problems, the researcher intends to test the validity of the encyclopedia book that has been developed as an encyclopedia book about the Anacardiaceae family in the Tabanio Beach Forest Area.

RESEARCH METHOD

The Tabanio Village Coastal Forest Area was used as a preliminary research site to produce the first draft of the encyclopedia book. The EDR (Research on Educational Design) approach was then used to conduct the development research, utilizing Tessmer's formative assessment design in four stages. However, this research only reached the expert review stage to collect content validity data. The test was conducted on the Lambung Mangkurat University campus to three experts, namely ULM Education Lecturers. After that, the research data was examined using Formula 1 by Zaini (2019), adapted from Nur (2013), to average the scores obtained by each evaluation component. Data analysis was done using descriptive categorization techniques, as shown in Table 1.

$$\overline{X} = \frac{\Sigma X}{n} \text{.....Formula 1}$$

Descriptions:
$\overline{X}$ = Average score of all aspects
ΣX = Total average score of validity aspects
n = Number of validity aspects

Table 1 Categories of Encyclopedia Validation

No.	Categories	Description
1.	1 ≤ X < 2	Not valid
2.	2 ≤ X < 3	Fairly valid
3.	3 ≤ X < 4	Valid
4.	4	Very valid

RESULTS AND DISCUSSION

The validity test of the encyclopedia material of the Anacardiaceae family in the Coastal Forest Area of Tabanio Village has been conducted. The cover and table of contents of the encyclopedia developed after the validation process can be seen in Figure 1.

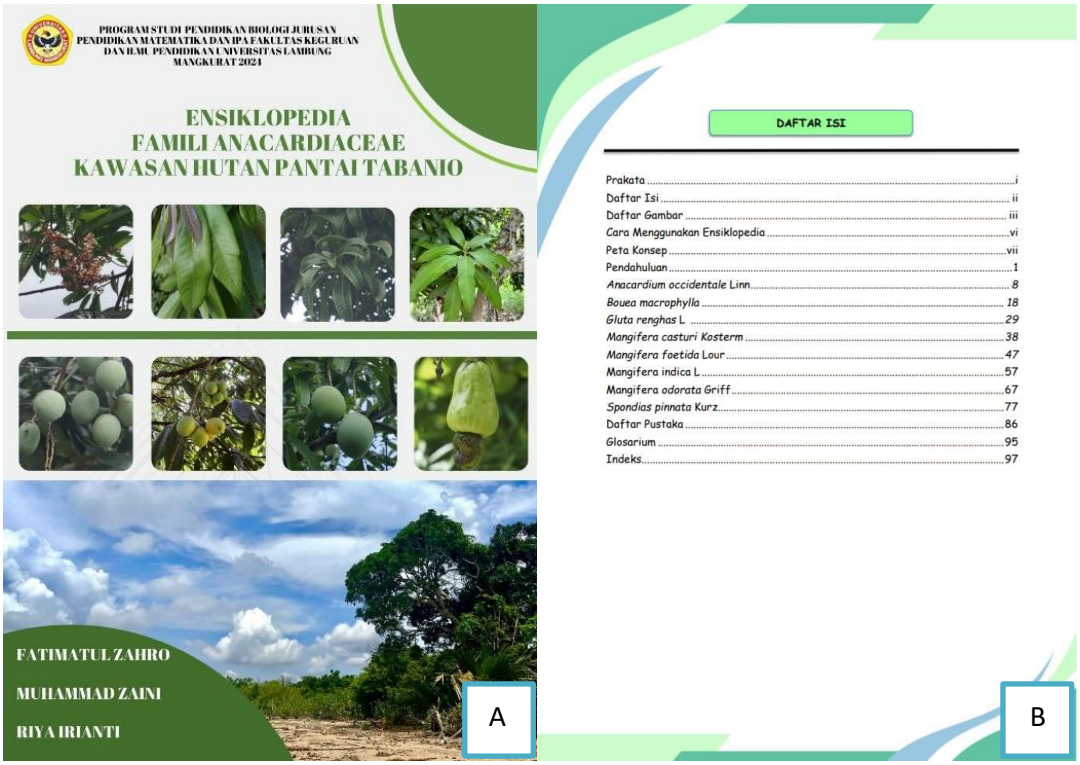


Figure 1 Front cover (A) and table of contents (B) (in Indonesian)

Table 2 Summary of Encyclopedia Book Content Validity Test Results

No.	Aspects	Score			Average	Categories
		V1	V2	V3		
1.	The material presented contains several definitions that are clarified by the glossary.	3	4	4	3,67	Valid
2.	The material is reinforced with several journals and other literature sources that strengthen the material	4	4	3	3,67	Valid
3.	The presentation of the material is clarified by the existence of a general description	4	4	4	4,00	Very Valid
4.	Loading illustrations according to the material presented	3	4	3	3,33	Valid
5.	The presence of images of each species strengthens the presentation of the material	3	4	4	3,67	Valid
6.	Image settings are more varied and customized	3	4	4	3,67	Valid
7.	The image layout is arranged according to the presentation of the material	3	4	4	3,67	Valid
8.	A description of the material is presented in alphabetical order according to established rules	3	3	4	3,33	Valid
9.	Presentation of material loaded alphabetically	4	4	3	3,67	Valid
10.	The material is presented with an index for easy learning	3	4	4	3,67	Valid
11.	Contains various scientific facts (IUCN/conservation status)	3	4	3	3,33	Valid
12.	The material contains an invitation to critical thinking	4	4	3	3,67	Valid
13.	The material is added with history or genealogy	3	3	3	3,00	Valid
14.	Instructions for using the encyclopedia are presented sequentially and clearly	4	4	4	4,00	Very Valid
15.	Important parts are clarified with how to use them	3	4	4	3,67	Valid
	Total score average category				**3,60**	**Valid**

Based on Table 2, encyclopedia books have the following benefits: the content is supported by an overview, the instructions for use are given clearly and concisely, and visual appeal is most important. Table 2 shows that the content of the encyclopedia is categorized as valid, with a total average score of 3.60, with aspects that obtain valid criteria, namely the material presented with a glossary contains several definitions that are clarified, the material is presented alphabetically, an index is provided to facilitate learning, there are various scientific facts (IUCN/conservation status), there are invitations to critical thinking, there is history and genealogy, and important parts are explained how to use them. Various journals and library sources strengthen the material, contain illustrations according to the material presented, and pictures of each species reinforce the presentation of the material. In addition, there are also aspects with very valid criteria, namely, the presentation of the material is clarified by the existence of a general description, and the instructions for using the encyclopedia are presented sequentially.

The content validity of the encyclopedia of the Anacardiaceae family in the Tabanio Coastal Forest Area is valid based on 15 aspects, with research results supported by previous research. Adawiyah et al. (2023) report that the encyclopedia with a very valid category can be used as a source of teaching biology. This encyclopedia has several advantages related to several aspects of the highly valid category. These aspects include presenting material clarified by the general description and instructions for using the encyclopedia presented sequentially. This aligns with Orkha et al. (2020), who state that the encyclopedia is a compendium of written works with broad, comprehensive, and easy-to-understand explanations about various forms of knowledge or certain scientific subjects. These writings are categorized alphabetically or by category. Another study from Rosnawati & Sunaryati (2021) on developing an encyclopedia based on the local potential of Wakatobi on the Mollusca Filum developed has specifications with quality criteria (standards) of non-text books. It has met the validity criteria with a score of (4.56), practicality criteria with teacher response scores (4.18) and student responses (4.07), and effectiveness with (85.370), so that it can be used as a learning resource.

The results proved that this encyclopedia is an impactful resource for teaching biology. The clear and sequential presentation of the material enhances its usability and educational value. In addition, the advantage of the Anacardiaceae encyclopedia as an educational tool is that it is comprehensive and easily accessible. The development of the encyclopedia by utilizing local potential needs to be followed up, especially its application in learning activities to observe its practicality, effectiveness, effect on learning outcomes, and student and teacher responses. The sustainability of this research aims to optimize and disseminate the use of this encyclopedia learning resource. According to Maha et al. (2022) and Sagara (2022), the sequential presentation of material needs to pay attention to its educational function because it indicates the feasibility of learning resources. Sequential material makes it easier for students to connect facts, concepts, procedures, and principles to learning resources.

CONCLUSION

The encyclopedia of the Anacardiaceae family developed in this study in the Tabanio Coastal Forest Area meets the validity criteria with a score of 3.60. Future research is expected to examine each encyclopedia aspect in more detail. Furthermore, more species can likely be collected because the Anacardiaceae family products produced in the Tabanio Coastal Forest Area comprise only eight species. The suggestion that researchers can give for the improvement of further research is that this encyclopedia book should be developed on other materials.

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