RESEARCH ARTICLE

The development of the woven plant encyclopedia of the Simpakng Dayak Tribe Ketapang Regency

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Abstract: The Dayak Simpakng community in Batu Daya village, Simpang Dua sub-district, has knowledge of making plaits by utilizing plants in the surrounding environment. The introduction of woven plants to students needs to be done to preserve the knowledge and woven plants of the Dayak Simpang tribe. This research aims to develop an encyclopedia of Dayak Simpang woven plants that is valid and feasible to use in learning. This research is a Research and Development (R&D) research with the Borg and Gall model. The instruments used are validation sheets, questionnaires, observation sheets, and interview sheets. The data were analyzed using a Likert scale questionnaire. This research involved three material expert validators, three media expert validators, and three language expert validators. The development trials were conducted in small-scale trials and large-scale trials. A total of 42 students were involved in the trial with a division of 12 students in the small-scale trial, and 30 students in the large-scale test. The results of validation by material experts obtained 92.18% (very valid), the results of validation by media experts obtained 96.66% (very valid), and the results of linguist validation obtained 93.51% (very valid). Based on the results of the small-scale trial, the score was 85.06%, and the results of the large-scale trial obtained a score of 85.50%. These results show that the encyclopedia of woven plants is very feasible to use in learning and get a positive response.

Keywords: Borg and Gall; Dayak Simpakng tribe; encyclopedia; woven plants

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Introduction

Indonesia has various provinces, one of which is the province of West Kalimantan. Batu Daya Village is one of the villages of Simpang Dua District, Ketapang Regency, West Kalimantan. This village has 2 hamlets, namely Keranji and Tunas Harapan Hamlets, which are dominated by Dayak Simpakng residents, the majority of whose occupations are farmers. Indonesia has a high potential for flora biodiversity (Nur et al., 2021; Suryani et al., 2017; Von Rintelen et al., 2017). One of them is in Batu Daya village, Simpang Dua sub-district, Ketapang Regency which has a typical regional flora, namely woven plants. Ketapang Regency has various types of tribes, one of which is the Dayak Simpakng tribe, the Dayak Simpakng tribe utilizes woven plants as woven craft products. Based on the results of observations on March 20, 2023, information obtained on the potential of woven plants in Batu Daya village is still available rattan, bemban, pandanus, and bamboo resources. This local wisdom has awakened traditional creativity for the community because of the nature and uniqueness of woven plants where almost all parts of woven plants can be used to be utilized as woven materials for daily living needs. Susanti et al (2022) stated that in the Batu Daya village area of Ketapang district, there were 10 types of rattan that were used by the community for wicker crafts and household needs. Wicker crafts are one of the traditional cultures that are still growing and developing in Indonesia (Hendriyana, 2022; Suswandari et al., 2022; Wahdina et al., 2021).

Woven crafts are still produced by some Indonesian people who have distinctive characteristics, and diverse forms of ornamentation using materials available in nature (Meken et al., 2022). Crafts can also be provocative and thought-provoking, providing new ways to reach and engage the general public (Pappne Demecs & Miller, 2019). Craft is about activity and action through the production of a prototype/product, in addition to the work of one's skills (Bell & Vachhani, 2020). Woven crafts as objects of human work in this case refer to skills, abilities, which aim to preserve crafts (Hendriyana, 2022). Based on this, this local potential can be utilized as a learning resource in the form of an encyclopedia, thus increasing students' knowledge about various types of woven plants and supporting activities in their preservation. Based on the results of interviews on March 23, 2023, which have been conducted through observations and interviews with biology teachers and students at SMAN 1 Simpang Dua, based on interviews with teachers obtained the results that the use of learning media for biodiversity material is still limited to using textbooks and student worksheet, and for material about woven plants has never been introduced to students. The results of interviews with several students found that during learning students lack interest in learning and tend to feel bored easily using package books and worksheets, because students are more interested in learning using learning media that contains colorful pictures. In other words, the learning resources used are still inefficient because many students feel bored with existing learning resources. The choice of learning media is important to consider, because teachers and students need learning resources as teaching materials in the learning process (Leasa et al., 2021; Viro et al., 2020). These objectives can be communicated effectively by developing appropriate and innovative teaching materials (Utami et al., 2023). In this case, the development of encyclopedias as learning media can be used as an interesting learning resource for students in adding new knowledge according to the studies discussed in it (Masrurah et al., 2023). Therefore, new learning resources such as encyclopedias are needed.

Encyclopedia is a contextual learning media with visual design that can stimulate the ability to think critically and creatively, and be fully involved in striving for an effective learning process, and be responsible for the effective learning process (Corke, 2016; Ketut Sudiana, 2022; Kumala et al., 2020). Encyclopedia can provide visualization that attracts students' interest in the learning process (Huang & Wang, 2017). The encyclopedia is equipped with scientific information and supported by original photos (Hernawati et al., 2018). Previous research findings state that encyclopedias can improve student learning outcomes and are suitable for use as learning media (Habiba et al., 2023; Julianti et al., 2021). Research by Ayu Renita, (2020) shows that the encyclopedia is feasible to use and can be used as an additional learning resource. This is also reinforced by Kumala et al (2019) which states that the development of encyclopedias is effective for improving students' concept understanding and critical thinking skills and can generate motivation for students in learning. Based on these findings, there was an increase in student scores on understanding concepts, thinking skills and generating motivation for students. This proves that the encyclopedia of woven plants can facilitate students in understanding the material and develop their thinking skills through activities in the encyclopedia. This research aims to develop a valid and feasible Dayak Simpakng woven plant encyclopedia so that it can be used in learning.

The development of this encyclopedia is expected to increase students' understanding of the local wisdom value of utilizing woven plants, because science learning can utilize the environment as a learning resource, including the local potential of an area (Audriansyah et al., 2022). The importance of cultural values in schools is reviewed from school management, learning processes, teachers, students, and school practitioners, these values refer to Indonesian local wisdom (Hidayati et al., 2020). Learning resources based on local potential can help students learn by connecting material and reality so that students can apply the material learned to the life around them by seeing the potential benefits of biodiversity, the integration between local wisdom and ethnobiology ultimately directly or indirectly supports the preservation of biodiversity (Rahayuningsih et al., 2017). Ethnobiological studies can also provide evidence of local knowledge about the management of biological resources, ethnobiological studies also focus on how local communities manage natural resources and the environment so that they can be utilized for their lives (Purwanto, 2021).

Method

This research is a research and development (R&D) method used in this research is the model (Borg & Gall, 1989) which is simplified into five stages, namely needs analysis, product development, expert validation and revision, small-scale testing, large-scale testing, and final product. The needs analysis stage includes learning media analysis, curriculum analysis, student characteristics analysis, woven safety tan analysis, and content analysis. The product development stage includes determining the media developed and making the encyclopedia. The expert validation stage includes product validation and revision by validators. Expert validation involved three material expert validators, three media expert

validators, and three language expert validators. The testing stage includes analyzing the validity, practicality, and effectiveness of the encyclopedia of woven plants. The product trial was conducted in high school, precisely at SMA Negeri 1 Simpang Dua, Simpang Dua District, Ketapang Regency, West Kalimantan. Technically, product testing was carried out twice, namely a small-scale test involving 12 XA class students, and a large-scale test involving 30 XB class students.

Data collection techniques in this study were observation, interview and documentation. The instruments used in this study were validation sheets and student response questionnaires. The response questionnaire was used to obtain students' responses to the encyclopedia, while interviews were conducted with unstructured techniques, researchers asked biology teachers and students. The data obtained from experts were then analyzed to determine the feasibility level of the encyclopedia using Formula 1 (Diani et al., 2021).

$$p = \frac{\sum x}{\sum x1} \text{x} 100\% \quad (1)$$

where P: Validity score in percentage; ∑x: Sum of all respondents' answers in one aspect; ∑x1: Sum of ideal answers in one aspect; and 100%: Constant.

The results of the data analysis are then interpreted and concluded according to the validity criteria by (Dwi Septiani & Okmarisa, 2023) as presented in Table 1.

Table 1. Encyclopedia Validity Criteria

Scoring Scale %	Criteria
81-100	Very Valid
61-80	Valid
41-60	Sufficiently Valid
21-40	Less Valid
0-20	Not Valid

First, calculate the validation results of the experts' assessment, then the student response questionnaire calculates the average using a Likert scale to determine the feasibility of the product. Expert assessment categories are shown in Table 1. The student response questionnaire assessment categories are shown in Table 2. To find out the student's response, it can be calculated according to the practicality criteria using the Formula 2 (Kartika et al., 2020).

$$\text{Response \%} = \frac{\sum Score\ obtained}{\sum \text{Total score}} \text{ x } 100\% \quad (2)$$

The results of the trial were conducted on 42 students and the results were interpreted as referred to (Dwi Septiani & Okmarisa, 2023) in Table 2.

Table 2. Criteria for Student Responses

Percentage (%)	Student Response Criteria
84 < score ≤ 100	Very Positive
68 < score ≤ 84	Positive
52 < score ≤ 68	Average
36 < score ≤ 52	Negative
20 < score ≤ 36	Very Negative

Results and Discussion

Needs Analysis

Needs analysis aims to identify potential and problems. Product analysis in this study was carried out through five stages, namely learning media analysis, curriculum analysis, student characteristics analysis, woven plant analysis, and material analysis. As explained in Table 3. Results of the Needs Analysis Stage. The results of the learning media analysis stage, learning media used in learning biodiversity biology are only limited to using textbooks and LKS. In addition, the material about woven plants has never been introduced to students. Curriculum Analysis, the curriculum used is the K13 curriculum. And analyze student characteristics.

Table 3. Results of the Needs Analysis Stage

Step	Results
Learning media analysis	The learning media used in learning biology biodiversity material is still limited to using textbooks and student worksheet, and the material about woven plants has never been introduced to students.
Curriculum analysis	The curriculum used is the K13 curriculum.
Student characteristics analysis	During the learning process, students lack interest in learning and tend to feel bored easily using package books and LKS, students are more interested in learning using learning media that contains colorful pictures. New learning media is needed for additional reference and to support the learning process.
Woven plant analysis	There are 11 types of woven plants in Batu Daya Village, Simpang Dua District, namely; 1.Bamboo betung (*Dendrocalamus asper*) 2. Bemban (*Donax canniformis*) 3. Reed lemang (*Scizostachyum brachyladum*) 4. Pandanus thorns (*Pandanus tectorius*) 5. Beladang rattan (*Korhalsia rigida*) 6. Dahanan rattan (*Korthalsia flagelariss*) 7. Smooth rattan (*Calamus hispidulus*) 8. Meiya rattan (*Korthalsia echinometra*) 9. Manau rattan (*Calamus manan*) 10. Sega rattan (*Calamus caesius*) 11. Ant rattan (*Korthalsia scaphigera*).
Material analysis	The material presented in this encyclopedia is the classification of woven plants, plant description, chemical content and fiber resistance of plants, plant morphology, plant utilization, and how to use woven plants.

A needs analysis is needed to obtain the fundamental problems encountered in the biology learning process. The existence of learning media is needed to overcome the problems that exist in schools, especially in the learning process (Nurrohmah et al., 2018). Learning media is a tool that can help the teaching and learning process so that the meaning of the message conveyed becomes clearer, thus learning can be achieved effectively and efficiently (Ariyanto et al., 2018; Nurrita, 2018). Learning media can be said to be effective and efficient if the material explained using learning media is clear and easily understood by students (Topano et al., 2023). The curriculum used is the K13 curriculum, which presents observations of various levels of biodiversity. The content contained and the learning objectives to be achieved in the media are adjusted to the curriculum and lesson plans used by the teacher.

Based on the analysis of the characteristics of some students that students have handbooks as learning materials used. However, students have difficulty because the presentation of package books and worksheets is less effective and monotonous, students prefer learning media that is practical and interesting and contains colorful pictures. The use of images and colors in printed media can be a solution to reduce the effects of boredom (Hidayat & Saputro, 2015). One of the efforts to utilize local potential into learning materials at school by integrating local wisdom values into learning biology at school is compiled in the form of a woven plant encyclopedia (Sary et al., 2023). At SMAN 1 Simpang Dua the development of learning media must be oriented to the needs of students who until now that the learning resources used by teachers in the learning process are in the form of package books and LKS. Therefore, teachers really want media facilities that can explore local biodiversity, especially related to the environment around students. The presence of learning media that emphasizes local potential can provide meaningful learning and can help students achieve learning objectives (Ardianti et al., 2019). The analysis of woven plants was carried out by interviewing the Dayak Simpang community of Batu Daya Village, interviews were conducted with the Customary Chief of Batu Daya Village, the head of the family, housewives, farmers, and woven plant craftsmen with an age range of 28-50 years and above. There are 11 types of Dayak Simpakng woven plants that support the development of encyclopedias shown in Table 4.

Based on the results of the analysis obtained shown in Table 4, the researcher documented the morphological characteristics of vegetative and generative organs. The results of identification and utilization will be compiled into an encyclopedia product.

Table 4. Types of Dayak Simpakng woven plants found in Batu Daya Village

No	Local Name	Spesies
1	Bamboo Betung (*Bambu Betung*)	*Denrocalamus asper*
2	Bemban (*Bemban*)	*Donax canniformis*
3	Reed Lemang (*Buluh Lemang*)	*Schizostachyum brachyladum*
4	Pandanus Thorns (*Pandan Duri*)	*Pandanus tectorius*
5	Belandang Rattan (*Rotan Belandang*)	*Korthalsia rigida*
6	Dahanan Rattan (*Rotan Dahanan*)	*Korthalsia flagelariss*
7	Smooth Rattan (*Rotan Halus*)	*Calamus hispidulus*
8	Meiya Rattan (*Rotan Meiya*)	*Korthalsia echinometra*
9	Manau Rattan (*Rotan Manau*)	*Calamus manan*
10	Sega Rattan (*Rotan Sega*)	*Calamus caesius*
11	Ant Rattan (*Rotan Semut*)	*Korthalsia scaphigera*

Product Development

After the needs analysis stage, the next step is the design stage which aims to design a woven plant encyclopedia that is used as learning media. Encyclopedia product design using canva. Canva has several diverse advantages that can produce attractive designs and make it easier to design learning media practically and save time (Wulandari & Mudinillah, 2022; Zebua, 2023). The content of this encyclopedia comes from the identification of Dayak Simpang woven plants obtained from interviews with Dayak Simpakng community informants. The developed encyclopedia consists of three main parts, namely the introduction, the content, and the closing. The initial part consists of the contents of the cover component, preface, table of contents, introduction, and user guide.

The content consists of morphological characteristics of plants, plant descriptions, distribution, chemical content and fiber resistance of plants, the use of plants as weaving, and qr codes containing video demonstrations of the weaving process using various types of woven plants, and finally references, glossary, author profile. Students who learn about plant introduction through a woven plant-based encyclopedia will solidify students' understanding of plant concepts, the utilization of woven plant encyclopedias as a medium that is easily accessible to students, because the encyclopedia itself is a list of subjects accompanied by definitions, background and biographical data arranged systematically, this encyclopedia has the advantage of making it easier for students to access information sought alphabetically. In addition, this encyclopedia is also equipped with pictures of woven plants accompanied by information that can make students more interested in learning about them. This will make students have a learning experience, so that students can remember the concepts taught.

The encyclopedia is made in accordance with ISO standards with dimensions of 21x29.7 cm. the visual presentation of the encyclopedia can be seen in Table 5.

Learning media that are in accordance with the needs of learning activities will create effective and efficient learning so that the material conveyed by the teacher to students can be absorbed optimally (Junaidi, 2019). Many researchers have stated that the use of encyclopedias can improve learning outcomes, understanding of concepts, learning motivation and critical thinking of students (Kustandi et al., 2021; Mulyani & Armiati, 2021; Suratno et al., 2023). Encyclopedia can be applied in learning for students both in the classroom and outside the classroom independently (Daryanes et al., 2023).

Validation stage

Validation aims to obtain assessments and suggestions and then as a reference to improve the encyclopedia book to produce a better product (Wibowo et al., 2019). Based on the assessment of material/content experts, media experts, and linguists. The validation of encyclopedia learning media was conducted by 9 validators consisting of 3 material experts (2 lecturers and 1 teacher), 3 media experts (2 lecturers and 1 teacher), and 3 linguists (1 lecturer and 2 teachers). Revisions were made in accordance with input from media experts, material experts, and language experts. The revision in this step is a design revision before the product trial. The result of the revision is an initial product that has been validated. In order for the initial product to be called suitable for use by students, it needs to be tested on the test subjects described in the trial stage. Based on the results of the assessment given by the experts, the results are shown in Table 6.

Table 5. Description of the display of the encyclopedia of woven plants

No.	Figure	Encyclopedia Section
1.		Cover of the Encyclopedia
2.		User Guide for the Encyclopedia
3.		Content section consisting of; classification, plant description, fiber strength, and chemical content of plants, distribution, and morphological parts of plants

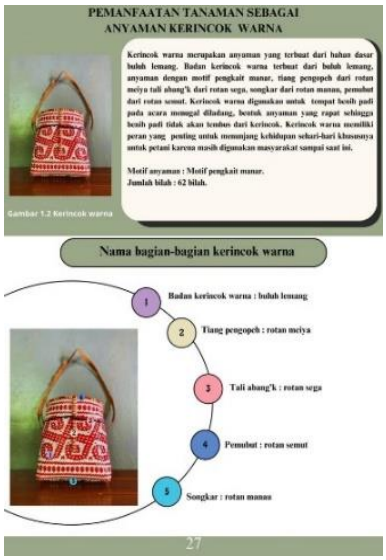
No.	Figure	Encyclopedia Section
4.		Steps for weaving woven products, accompanied by QR code for instructional weaving videos.
5.		Utilization of plants for weaving and the names of the woven parts.

Table 6. Percentage by experts

No	Assessment Aspect	Average Feasibility (%)	Criteria
1	Content	92.18	Very Feasible
2	Media	96.66	Very Feasible
3	Language	93.51	Very Feasible

Table 5. The results of the experts' assessment show that the encyclopedia learning media can be used. The average percentage of feasibility for material experts is 92.18%, meaning that the encyclopedia is very feasible to use, the media aspect is 96.66%, meaning that the encyclopedia is very feasible to use, the language aspect is 93.51%, meaning that the encyclopedia is very feasible to use. learning media that have been categorized as feasible by experts can be tested to users. However, before being tested, improvements and adjustments are made according to development suggestions from media experts so that a good, optimal, accurate, and reliable product can be produced (Efendi et al., 2023).

Student Response and Final Product

Student response questionnaires are used for evaluation of small-scale trials and large-scale trials. Small-scale trials and large-scale trials were conducted after validation by material experts, media

experts and linguists. Students were asked to adjust the learning experience while using the encyclopedia based on 18 questions given in Table 7. Based on the results obtained from the student response questionnaire that the use of the Dayak Simpakng woven plant encyclopedia is feasible to use as a learning resource, this is evidenced by the student responses generated in the small-scale trial and the large-scale trial are very positive. This can be seen in Table 7 in the results of student responses to the small-scale test which received 85.06% criteria (very positive) and the large-scale trial received 85.50% criteria (very positive).

Table 7. Results of small-scale test and large-scale test student responses to the encyclopedia of woven

No	Statement	Small-Scale Trial		Large-Scale Trial	
		%	Criteria	%	Criteria
1.	This encyclopedia makes it easy for me to learn	83.33	Positive	89.16	Very Positive
2.	The material in this encyclopedia is difficult to understand	77.08	Positive	77.5	Positive
3.	This encyclopedia gives me the opportunity to learn according to my abilities	87.5	Very Positive	92.5	Very Positive
4.	Learning using this encyclopedia is no different from using worksheets and textbooks	75	Positive	84.16	Very Positive
5.	Without the teacher's explanation, this encyclopedia can be used as a self-learning media	79.16	Positive	75.83	Positive
6.	Without the teacher's explanation, the biodiversity in this encyclopedia is difficult to understand	77.08	Positive	77.5	Positive
7.	This encyclopedia can encourage me to actively learn	83.33	Positive	92.5	Very Positive
8.	Learning with this encyclopedia makes me feel bored	79.16	Positive	84.16	Very Positive
9.	I am interested in studying biodiversity using this encyclopedia	79.16	Positive	90	Very Positive
10.	I am less interested in studying biodiversity using this encyclopedia	79.16	Positive	85	Very Positive
11.	Text and writing in this encyclopedia are clear and easy for me to understand	85.41	Very Positive	93.33	Very Positive
12.	This encyclopedia uses language that is difficult to understand	87.5	Very Positive	85.83	Very Positive
13.	The images and material presented are clear and enhance my understanding	83.33	Positive	90.83	Very Positive
14.	The images and material in this encyclopedia are not appropriate, making it difficult to understand	83.33	Positive	88.33	Very Positive
15.	This encyclopedia makes it easy for me to learn	77.08	Positive	90.83	Very Positive
16.	This encyclopedia makes it difficult for me to learn	83.33	Positive	85	Very Positive
17.	Learning resources are not only from the Woven Plant Encyclopedia but also from other supporting books	70.83	Positive	94.16	Very Positive
18.	I can use this encyclopedia as a learning media both at school and outside school	83.33	Very Positive	81.66	Positive
	Average	85.06	Very Positive	85.50	Very Positive

The use of a woven plant encyclopedia can have an influence on student interest in learning and student success in understanding the learning taught by the teacher. The existence of learning media plays an important role in the quality of student learning because not only teachers who actively provide material to students, but students can also be active in learning (Lafifa et al., 2022). This can be seen from the results of small-scale trials obtained results with an average of 85.06% (Very positive), large-scale trials obtained results with an average of 85.50% (Very positive) which means that students are very interested in learning to use the encyclopedia of woven plants.

This encyclopedia is designed with contextual and visual design equipped with original photos of woven plants. Hernawati et al (2018) said that images or photos can provide a real picture to show the actual object, provide a more vivid learning atmosphere and are more accurate than words, so that they can stimulate the thinking ability of students. Contextual learning can be applied to obtain effective learning outcomes (Naziah et al., 2020). The encyclopedia contains local wisdom biodiversity material so that the existence of learning media in the form of a woven plant encyclopedia has ethnoscience potential to become a source of knowledge that can be explored to increase students' enthusiasm for learning (Hikmawati et al., 2020). The final product of the encyclopedia is an encyclopedia that has gone through several stages to produce an encyclopedia that is ready for use. The encyclopedia stages consist of needs analysis, product development, revision according to suggestions from validators, small-scale trials and large-scale trials, aiming to find out how students respond to woven plant encyclopedia learning media so as to produce encyclopedias that can be used by students to learn and make it easier for students to understand the lessons taught by teachers, especially in biodiversity material regarding woven plants and the benefits of woven plants.

Conclusion

The results showed that the development of the Dayak Simpang woven plant encyclopedia was very valid and could be used in learning. The results of encyclopedia validation have met the predetermined assessment criteria both in terms of very valid material, very valid language aspects and very valid media aspects. Both small-scale and large-scale tests produced very positive criteria. Thus, the Dayak Simpakng woven plant encyclopedia can be utilized as a learning media.

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Conflict of Interest

The researcher declares that there is no conflict of interest regarding the writing of this article.
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Author Contributions

A.J. Saputri: Methodology; data analysis; manuscript writing; review and editing. **A. Sunandar:** Manuscript writing; review; reference finding and editing. **M. Qurbaniah:** Article writing, review; and editing.

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