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The practicality of popular scientific books on Moraceae plant ethnobotany case study at KHDTK ULM

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Abstract

Cultural heritage in an area that is unique is one step in preserving it so that it can be used as a source of learning based on local potential in contextual learning developed in popular scientific book teaching materials. This development research entitled "Ethnobotany of Moraceae Plants Case Study at KHDTK ULM" aims to examine the practicality of the contents of the BIP, the practicality of expectations and the actual of BIP. The method in developing this research is to lead to formative evaluation by Tessmer. The results of the research on the readability test got very good criteria with an average value of 94.23%, in addition, the results of the BIP implementation test with an average value of 95.18% so that it can be grouped into very good criteria and the results of student responses show the average score BIP is 96.15% so it can be grouped into very practical criteria. This shows that a popular scientific book with the title "Plant Ethnobotany Moraceae case study at KHDTK ULM" is very practical to use and attracts students' reading interest in Ethnobotany learning.

Abstrak

Warisan budaya pada suatu daerah yang bersifat khas yaitu salah satu langkah dalam melestarikannya sehingga dapat dimanfaatkan sebagai sumber belajar berbasis potensi lokal dalam pembelajaran kontekstual yang dikembangkan dalam bahan ajar buku ilmiah populer. Penelitian pengembangan ini berjudul “Etnobotani Tumbuhan Moraceae Studi kasus di KHDTK ULM” memiliki tujuan untuk menguji kepraktisan isi BIP, kepraktisan harapan dan aktual BIP. Metode dalam pengembangan penelitian ini yaitu menggarah pada evaluasi formatif oleh Tessmer. Hasil penelitian pada uji keterbacaan mendapatkan kriteria sangat baik dengan nilai rata-rata 94,23%, selain itu, hasil uji keterlaksanaan BIP dengan nilai rata-rata 95.18% sehingga dapat dikelompokan dalam kriteria sangat baik dan hasil respon mahasiswa menunjukan hasil nilai rata-rata BIP yaitu 96,15% sehingga dapat dikelompokan dalam kriteria sangat praktis. Hal tersebut menunjukan bahwa buku ilmiah populer dengan judul “Etnobotani Tumbuhan Moraceae studi kasus di KHDTK ULM” sangat praktis digunakan dan menarik minat baca mahasiswa dalam pembelajaran Etnobotani.

A. Introduction

South Kalimantan is a large island, has abundant biodiversity potential and has a very diverse plant species with a variety of different habitats, some areas where most of the land is wetlands in the form of rivers, estuaries, mangrove forests, swamps, peat swamps. , swamps without forests, reservoirs and coastal areas besides that there is also a protected forest which is used as a Special Purpose Forest Area (KHDTK) which is an educational forest area of Lambung Mangkurat University.

The KHDTK ULM Educational Forest is the place for the peak of reforestation in Banjar Regency, this area is also famous as a Mandi Angin tourist attraction. It is an area that can be said to be still beautiful, due to the availability of a variety of natural diversity that is still productive as a source of food or as a source of education and is a habitat for many flora and fauna, including some plants from the genus Ficus, Artocarpus and Morus belonging to the Morcaea family.

In general, the family Moraceae can be easily found in areas with ecological conditions as diverse as in dry soils, mountains, lowlands, sandy dry soils, and sandy clay, the Moraceae family is generally consumed by local people as a source of food,, or in carrying out other life activities. Some types of plants from this family are used by the community for the benefit of customs and and special beliefs in the use of natural resources.

The Moraceae family is traditionally used by the community around KHDTK ULM which refers to six ethnobotanical studies including Kariwaya (*Ficus benjamina*), Jackfruit (*Artocarpus heterephyllus*), Breadfruit (*Artocarpus altilis*), Tarap (*Artocarpus elasticus*) and Mulberry (*Morus alba*). People's knowledge of the use of plants around them needs to be maintained by including traditional botanical knowledge education which is the local potential of the local community for that there needs to be a special approach, such as BIP which contains information related to these plants so that they are known by the wider community.

Based on these conditions, this becomes a big enough potential for the development of innovative teaching materials with local content by utilizing the surrounding environment. The development of innovative and interesting learning resources is very important. The development of innovation in packaging learning resources for students or the wider community has a major influence on the success of the knowledge transfer process carried out (Prastowo, 2015). The process of contextual learning is one of the educational processes that can help readers see the meaning in the subject matter they learn so that it can be implemented in everyday life, namely in the context of their personal, social, and cultural environment (Kadir, 2013). One of them is learning that is packaged in the Ethnobotany course.

Ethnobotany is an elective subject in the Biology Education Study Program at ULM, which is a course that teaches us about the interaction between society and its environment. This study is a descriptive form of documenting the traditional botanical knowledge of the local community. The use of local potential-based teaching materials greatly helps students to more easily understand learning materials, especially in Ethnobotany courses. Therefore, it is necessary to develop teaching materials such as BIP which can support the ethnobotany concept material.

Popular scientific books (BIP) is a learning resource developed with one that contains the local potential of an area asa learning meter with a popular language to improve students' critical thinking skills. Putri et al. (2020) stated that BIP developed based on local potential is noted to be very good for improving the skills of student science processes. According to Tim Editor LIPI Press (2016), popular scientific book is a book written with scientific rules and compiled in a very simple way and using language that is easily understood by readers. Latifah et al. (2018) state the use of local potential-based beep is very beneficial for learners in learning because in popular scientific books there are several advantages, one of which is the inclusion of images of plants that have different colors and are accompanied by local names on each plant, so that it can attract students' reading interest and make it easier to understand the learning materials.

Research on the development of popular scientific book teaching materials based on local potential is imported by Nurlita et al. (2021) the practicality of the Popular Scientific Book of Diversity Pteridophyta is declared practically used. Based on the research relevant to the research conducted by Fajrin et al. (2021) on the practicality of popular ethnobotany scientific books declared practically used as an enrichment material ethnobotany learning.

Based on the background of the study of plant ethnobotany as well as the need for reference teaching materials to support the ethnobotanical concept material which contains descriptions with examples that are around the environment and the absence of research on developing local potential at KHDTK ULM underlies researchers to develop teaching materials based on local content made in

the form of a popular scientific book material on Moraceae plant ethnobotany, a case study at KHDTK ULM.

B. Material and Method

This type of research is development research. The development research used refers to the formative test design of Tessmer. A preliminary study was conducted to analyze the essential materials that can be used in ethnobotany learning. The product developed is in the form of a popular scientific book entitled "Plant Ethnobotany Moraceae, a case study at KHDTK ULM".

Data on the practicality of the contents of popular scientific books were obtained from the results of the One to one test while the practicality of expectations was obtained from the Small group test and the actual practicality was obtained from the Field test based on Tessmer's Formative Evaluation which obtained the following data:

1) Student readability test. The instrument used is a contents preview sheet.
2) The implementation of the use of popular scientific books. Instrument used is a sheet of expectations and actual implementation.
3) Student responses to the use of popular scientific books. The instrument used is a practical test sheet of expectations and actual in the form of student response questionnaires. Results and Discussion.

C. Results and Discussion

1. Student Readability

The practicality of the contents of the popular scientific book Moraceae Plant Ethnobotany case study at KHDTK ULM aims to determine the effectiveness of popular scientific books developed for students who use them during learning. The practicality of the content or student readability test was obtained based on the assessment of the presentation and display of the BIP which was developed by involving three undergraduate Biology education students who had passed the ethnobotany course which was developed in detail as shown in Table 1.

The results of the student readability test at the one-to-one evaluation stage aim to assess the presentation of popular scientific books that are attractive both in terms of appearance and content of the book so as to generate interest in reading in students towards popular scientific books. The readability test involves three students who have taken the Ethnobotany course as a subject in the assessment of popular scientific books being developed and these students will provide assessments and suggestions for improvement. The results of the student legibility test on the development of the popular scientific book "Plant Ethnobotany Moraceae case study at KHDTK ULM" can be seen in Table 1 obtaining an average value of 94.23% (very good category).

Table 1 Student Readability Test Results

No	Validated indicators/aspects	Student			Average
		I	II	III	
1	Easy to understand text	4	4	3	3.67
2	image is clear or not blurry	4	3	4	3.67
3	there is a description on the picture	4	4	4	4.00
4	the image presented is interesting	3	3	3	3.00
5	the image presented is in accordance with the material	4	4	4	4.00
6	There is an explanation of the concept using illustrations of problems related to everyday life	4	4	3	3.67
7	using everyday life examples	4	4	4	4.00
8	encourage discussion with other friends	4	4	4	4.00
9	related to biological material	4	4	4	4.00
10	the material is coherent	3	3	4	3.33
11	there are no sentences that have a double meaning	4	3	4	3.67
12	symbols or symbols in this popular scientific book are easy to understand	4	4	4	4.00
13	the terms in this popular scientific book are easy to understand	4	4	4	4.00
Overall average (%)					**94.23**
Criteria					**Very good**

This is based on excellence in presenting the contents of the book that has been in accordance with the aspects that have been determined, including the use of sentences that are easy to understand using simple language and also the use of clear images equipped with information so that students are more interested and easy to understand. The presentation of popular scientific books related to biological material, especially ethnobotany, in a coherent and orderly manner makes students more comfortable in studying the contents of the book. As described by Mulyati

(2002) that pictures or photos in learning resources with the aim of providing understanding to the reader, as well as providing learning innovations that are not boring. The descriptions on each picture make it easier for students to conclude so that it attracts the reader's interest and helps clarify information.

The level of readability of popular scientific books includes aspects or techniques in presenting a book and the language used. Based on individual trials, it focuses more on factors that affect student learning outcomes. At this stage obtained (assessment, comments, observations, and student suggestions) which are used as indicators in product improvement. Putra et al. (2021) explained that it is important to carry out individual tests so that the teaching materials developed are in accordance with the conditions of students in the field. In addition, teaching materials according to student needs makes it easier for students to learn independently, thereby increasing interaction as a process in the learning experience.

According to Taqwa et al. (2020), the readability test has the aim of making it easier for students to use popular scientific books so they don't make mistakes. Therefore, popular scientific books that have been developed also have shortcomings and must be revised to suit the needs of students. Based on student assessments, some of the pictures are not in accordance with the illustrations so that it confuses students in determining examples and explaining problems in concepts that are suitable for everyday life according to ethnobotany studies.

Student assessments and suggestions are very important at this stage of the readability test because they form the basis for the improvement of popular scientific books which are developed in order to meet student demands for more optimal learning with good and quality teaching materials and adapt to student needs, especially in subjects ethnobotany course.

Popular scientific books that have been developed can be continued in the next stage to perfect the product development so that it can be used in contextual learning on students' critical thinking skills in studying ethnobotany learning. In accordance with what was stated by Khairiyah et al. (2016) that readability is a benchmark in adapting material to teaching materials that have been presented as reading material developed for readers, both the general public and students. This is also in line with what Arifin et al. (2019), that the readability test aims to determine the level of readability by students, so that it does not cause multiple interpretation statements that have multiple meanings.

2. Implementation of the Use of BIP

The implementation test involved 5 students for expected data and 20 students for actual data. Use of popular scientific books "Plant Ethnobotany Mora-ceae case study in KHDTK ULM" can be seen in Table 2.

Table 2 Implementation of the Use of BIP

No	Statement	Execution	
		Hope	Current
1	Students read the front (table of contents, instructions and explanation of contents)	100.00	100.00
2	Students read the introductory information	100.00	100.00
3	Students read descriptions of general information	66.67	100.00
4	Students look at pictures and information in the popular scientific book "Ethnobotany Moraceae (Case Study in Forest Areas with Special Purpose ULM)"	100.00	90.00
5	Students look at the writing on the colored boxes	66.67	100.00
6	Students read facts about the concept of ethnobotany	100.00	100.00
7	Students reading the glossary	100.00	100.00
8	Students use the popular scientific book "Ethnobotany Moraceae (Case Study in Forest Areas with Special Purpose ULM)" when making observations	100.00	100.00
9	Students use the popular scientific book "Ethnobotany Moraceae (Case Study in Forest Areas with Special Purpose ULM)" when conducting data analysis	100.00	90.00
Percentage (%)		**92.59**	**97.78**
Criteria		**Very good**	

Based on the results of Table 2 on the BIP implementation test "Plant Ethnobotany Moraceae case study in KHDTK ULM" in the expected and actual terms, the results obtained an average of 95.18% with very good criteria. This shows that the popular scientific books developed are practical to be used in teaching ethnobotany courses on students' critical thinking skills.

The implementation of popular scientific books developed is carried out systematically, sequentially, and regularly in accordance with the RPS which requires students to be active in the learning process, students pay attention to each

presentation of the content of scientific books developed starting from reading the front and the preliminary information listed in addition to the use of pictures. The interesting thing makes students look at the pictures and their descriptions so that readers are motivated about the facts of the ethnobotany concept of Moraceae plants and use popular scientific books that are presented to help identify during observations or practice. In line with what was explained by Rahmiati et al. (2021) that the results of the implementation of popular scientific books were influenced by the process of implementing systematic, sequential, and in accordance with the applicable curriculum.

Popular scientific books developed are also equipped with questions and statements of critical thinking skills in order to raise problems in the minds of readers regarding the use and what solutions to do which are presented coherently in the developed scientific books so as to create popular scientific books that are practical and easy to understand in every use. both for public consumption and in the learning of students' critical thinking skills. This is in line with that stated by Dhamono et al. (2019), that the teaching materials developed must contain statements to explore students' critical thinking skills. The existence of these statements makes students sequentially or systematically study part by part of the material presented in the BIP. It is also stated by Pambudi et al. (2019) that an organized and systematic learning plan will have a good impact on learning and achieve good learning objectives.

The statement above and in line with previous research can lead to the conclusion that the popular scientific book "Ethnobotany of Moraceae Plants, a case study at KHDTK ULM" with a very good category is included in the development of teaching materials that are practical to use and can help students in attracting contextual interest in learning, especially ethnobotany learning. based on the results of the student implementation test.

3. Student Response to BIP

Student responses to the popular scientific book Moraceae plant ethnobotany case study at KHDTK ULM to find out the implementation of BIP developed for learning involving five students for expected data and 20 students for actual data, students from S1 Biology Education ULM who have passed the ethnobotany course. The results of student responses are presented in Table 3.

Table 3 Student Responses to BIP

No	Statement	Practicality	
		Hope	Current
1	This popular scientific book "Ethnobotany of Moraceae (Case Study in Forest Areas with a Special Purpose)" motivates me to study.	100.00	99.00
2	I can learn actively and independently with this popular scientific book on Moraceae ethnobotany (Case Studies in Forest Areas with Special Purposes).	96.00	96.00
3	The material presented can be understood easily.	100.00	97.00
4	The popular scientific book "Ethnobotany of Moraceae (Case Study in Forest Areas with a Special Purpose)" is very interesting and not boring when used.	96.00	97.00
5	If the use of the popular scientific book "Ethnobotany of Moraceae (Case Studies in Forest Areas with a Special Purpose)" is implemented like this, the concepts from the lesson material can be remembered easily and for longer.	96.00	97.00
6	The use of this popular scientific book "Ethnobotany of Moraceae (Case Study in Forest Areas with a Special Purpose)" can help solve problems in everyday life related to learning topics.	96.00	96.00
7	The use of this popular scientific book "Ethnobotany of Moraceae (Case Study in Forest Areas with a Special Purpose)" has broadened my horizons.	92.00	97.00
8	I can understand the material with the help of good quality pictures.	100.00	96.00
9	I can study according to the needs of independent study.	96.00	97.00
10	Learning by using this popular scientific book "Ethnobotany of Moraceae (Case Study in Forest Areas with a Special Purpose)" can help me develop critical thinking skills.	100.00	98.00
SPercentage (%)		**95.20**	**97.10**
Criteria		**Very Practical**	

The popular scientific book "Ethnobotany of Moraceae Plants, Case Study at KHDTK ULM" which was developed based on the results of student responses both expected and actual, obtained an average result of 96.15% with a very good category. This shows that in actual and expected popular scientific books developed according to students are very practical to use and can explore students' critical thinking skills in systematically studying ethnobotany courses.

Practically based on student responses, it means that the developed BIP is easy to use

anywhere and anytime able to provide motivation and interest in learning, students find it helpful to understand the material independently and open students' horizons so that they are able to train students' critical thinking skills.

Research and development products are said to be practical when they are easy to use for users in a learning environment (Tessmer, 1993). The term practical has the same meaning as easy to use (usability) (Plomp & Nieveen, 2007). Popular scientific books developed are easy for students to understand because of the systematic and simple presentation of material accompanied by real pictures that are associated with knowledge and adapted to student experience according to learning needs. This is in line with what was stated by Latifah et al. (2020) that the presentation of content or material accompanied by pictures, associated with knowledge and adapted to experience will make it easier for students to understand the contents of popular scientific books. This is also in line with what was stated by Dewi et al. (2010), that interesting teaching materials are when using images with appropriate illustrations so as to clarify the content of the material that is easy for students to understand.

Figure 1
Examples of illustration images of mulberry herb processing in the Popular Scientific Book of Moraceae plant ethnobotany case study at KHDTK ULM

The advantages of popular scientific books that aredeveloped in an attractive presentation can not be separated from the manufacturing process by paying attention to various aspects that are written in a simple and using popular language style, concise and dense, contains information that is easy to remember and understand, so that it attracts reading interest and is easily understood by a wide audience and provide an interesting variety of appearance so as not to be boring. This makes it easy to learn, and not boring, and easy to carry anywhere so that it can be studied anytime and anywhere.

Learning the ethnobotany of Moraceae plants using popular scientific books went well. This is explained by Akbar (2013) that good learning is carried out in an interactive, inspiring, fun, challenging and motivating way for students to participate actively. Nurlita et al. (2020) stated the popular scientific books that are coherently created in such a way can make it easier for readers to understand clearly. Tessmer (1993) stated that the practicality test was focused on data about students' abilities to confirm the success of improving product results before field testing.

The results of positive student responses to ethnobotany learning using the popular scientific book "Ethnobotany of Moraceae plants, a case study at KHDTK ULM" which is practically expected to improve students' critical thinking skills. According to Dharmono et al. (2019) that the practicality of popular scientific book development products is very important before the product is used to measure its effectiveness, the practicality of teaching material development products is not only for popular scientific books, but also for other types of teaching materials. This is in line with Yi & Cho (2011) that popular scientific books are practical to use and easier to learn and understand because popular scientific books are scientifically structured and structured so that they can attract student interest.

D. Conclusion

The results of the research on the development of the popular scientific book Moraceae Plant Ethnobotany, the case study at KHDTK ULM, is stated to be very practical and can be used in learning to increase reading interest and train critical thinking skills of students in learning, especially ethnobotany courses. This is based on the average results of the stages of the student readability test getting a value of 94.23%, the results of the implementation of popular scientific books that are carried out on students get an average result of 95.18%, while for the results of popular scientific books based on the results of the students response get an average of 96.15%. The assessment is included in the very good category so that the book can be said to be practical to use in studying Ethnobotany courses.

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