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The Practicality of Popular Scientific Books based on the Diversity of Mangrove Shrubs in Tabanio Village

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Abstract

The development of a popular scientific book that is developed based on the local potential of a region is one solution that can be used to overcome problems that often arise such as a lack of student reading interest due to boring teaching materials and learning medifications in the Low Plant Botany course, especially in several studies of shrub diversity that require students to make direct observations. This development research aims to describe the practicality of the popular scientific book prototype entitled "Diversity of the Mangrove Shrubs in Tabanio Village." The research method used was the development model by EDR which was limited to the formative evaluation phase based on the Tessmer model. The results showed that the results of the feasibility test for popular scientific books got an average score of 88.9% with very good criteria and the results of student responses to popular scientific books got an average of 89.18% with criterion strongly agree. This shows that a popular scientific book entitled "Diversity of Mangrove Shrubs in Tabanio Village" is very practical to be used as an enrichment material in learning Low Plant Botany.

Abstrak

Pengembangan sebuah buku ilmiah populer yang dikembangkan berdasarkan potensi lokal yang dimiliki sebuah daerah merupakan salah satu solusi yang dapat digunakan untuk mengatasi masalah-masalah yang sering muncul seperti kurangnya minat membaca mahasiswa karena bahan ajar dan medifikasi pembelajaran yang membosankan pada mata kuliah Botani Tumbuhan Tinggi khususnya pada beberapa kajian keanekaragaman semak yang mengharuskan mahasiswa untuk melakukan pengamatan langsung. Penelitian pengembangan ini bertujuan untuk mendeskripsikan kepraktisan *prototipe* buku ilmiah populer yang berjudul "Keanekaragaman Semak Mangrove Desa Tabanio" Metode penelitian yang digunakan ialah model pengembangan *Education Design Reserch* (*EDR)* yang dibatasi sampai pada fase evaluasi formatif berdasarkan model Tessmer. Hasil penelitian menunjukan hasil uji keterlaksanaan buku ilmiah populer mendapatkan nilai rata-rata 88,9% dengan kriteria sangat baik dan hasil respond mahasiswa terhadap buku ilmiah populer mendapatkan rata-rata 89,18% dengan kriteris sangat setuju. Hal tersebut menunjukan bahwa buku ilmiah populer dengan judul "Keanekaragaman Semak Mangrove Desa Tabanio" sangat praktis digunakan sebagai bahan pengayaan dalam pembelajaran Botani Tumbuhan Tinggi.

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A. Introduction

South Kalimantan is an area that has various kinds of potential for biodiversity as well as several habitats for living things in the area, including mangrove forests, swamp forests, protected forests, and coastal forest vegetation. Mangrove forest is a coastal forest ecosystem consisting of groups of trees that can live in an environment with high salt content. One of the characteristics of mangrove plants has roots that stick out to the surface. According to Taksu and Wesnawa (2019), they describe in general that mangrove forests grow that live between brackish watery swamps located on the shoreline and around river mouths which have very important benefits for the life of the surrounding natural ecosystem. In addition, mangroves have several benefits for the community such as the use of mangrove plants as medicinal plants for the community (Wibowo et al., 2009). Efforts to develop popular scientific books based on local potential are important so that through this research they can provide information to the wider community about the local potential possessed by the people of Tabanio Village in South Kalimantan.

Tabanio mangrove forest is an area that provides productive natural resources both as a source of food and education and is a habitat for many flora and fauna, this area will also be used as a tourist attraction. Based on preliminary research, South Kalimantan has several mangrove shrubs such as Legundi, Mule Tikus, Kemunting, Karamunting, Lamas-lamas, Jejuru, Putri malu, Tail Tikus, Kirinyuh and Morning Flowers.

Popular scientific books are a good source of learning media for students because they have several advantages so that they are easily understood by students. Adequate sources of learning media can produce students who are competent in their fields (Abdullah, 2012). The purpose of this development is to identify the utilization, processing, and preservation of beneficial plants by local communities.

According to Prastowo (2015) a good book is a book that is written using good language and is easy to understand, presented in an attractive manner equipped with pictures and clear descriptions, the contents of the book also describe something that is in accordance with the idea of \u200b\u200bthe writing. The benefits of making popular scientific books for students include making learning activities more interesting, getting opportunities to study independently and getting convenience in learning every competency that must be mastered (Putri et al., 2020).

Higher Plant Botany Learning is a study to find out the types of plants that are grouped into low plants and to take advantage of the local potential of an area, especially in mangrove shrubs in the South Kalimantan area.

The use of popular scientific books based on local potential is very helpful for students in learning because in popular scientific books there are several advantages, one of which is the presence of colorful pictures of plants accompanied by the local names of the plants so that they can attract students' reading interest and make it easier to understand the learning material (Latifah, 2010). et al. 2018). There is a need for the development of supporting teaching materials (supplementation) of population concept materials that contain material with examples from the surrounding or local environment. This is what underlies researchers to develop teaching materials based on local content in the form of popular scientific books.

Several studies on the development of popular scientific books have been studied by Ridhana et al. (2021) in his research on the effectiveness of pteridophyte popular scientific books in the Loksado area to improve students' critical thinking skills, it was stated that the increase in student learning outcomes was high after using popular scientific books. popular scientific studies of shrimp species in Tabanio coastal waters to improve critical thinking skills of high school students which shows that popular scientific books are stated to be very valid, very practical, and very effective. Therefore, this popular scientific book "Types of Shrimp in Tabanio Coastal Waters" can be used as enrichment material to train high school students' critical thinking skills. Based on these studies, it appears that there are still quite wide opportunities in developing teaching materials, one of which is popular scientific books.

B. Material and Method

1. Research Flow

This type of research is development research. The development research used refers to the development design of Tessmer (1998). A preliminary study was conducted to analyze the essential materials that can be used in learning Higher Plant Botany.

The preparation and development of the draft book aims to formulate the purpose of the book, determine the components of the draft book based on a preliminary study so that a draft book will be developed (Cahyono et al., 2018). The steps taken are collecting information to review competency standards in learning Higher Plant Botany. After that, conducting an assessment

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problems in the study of Higher Plant Botany. The next step is to find a solution to the problem based on the potential of the Tabanio Village area, namely mangrove shrubs which are plant species used as learning media.

The results of the preliminary research become the basis for the preparation of a popular scientific book entitled "Diversity of Mangrove Bush Plants in Tabanio Village". After that, it will be validated by experts/experts. The research instruments used include validation sheets of popular scientific books filled out by 3 educational experts and biologists. The individual test (readability) was carried out by 3 students who had taken the Higher Plant Botany course Putri et al. (2020).

The practicality of popular scientific books was obtained from a series of small group tests (one to one), the implementation of popular scientific books using the instrument of implementing popular scientific books and the opinions of three students using student response questionnaires. This is supported by Fajrin et al. (2021) which uses 3 students in a small group test.

C. Results and Discussion

1. Student Readability

The practicality of the contents of the popular scientific book Diversity of Mangrove Bush Plants in Tabanio Village was obtained from the results of the student legibility test (three students) as shown in Table 1. The final results of the student readability test are categorized based on the development of Arikunto in Fatmawati, (2014) as shown in Table 2.

Table 1 Student Readability

No	Indicator	Student			Average
		1	2	3	
1	The text is easy to understand.	4	4	3	3.67
2	Clear picture	4	4	3	3.67
3	There is a description in the picture	3	4	4	3.67
4	Interesting picture.	4	4	4	4.00
5	The images presented are in accordance with the material	3	3	4	3.33
6	Explaining a concept using illustrations of problems related to everyday life.	4	4	4	4.00
7	Using everyday life examples.	4	4	4	4.00
8	Encourage discussion with other friends.	4	3	4	3.67
9	Relating to biological material.	4	-	4	2.67
10	The material is coherent.	4	3	4	3.67
11	No sentence has a double meaning.	4	4	3	3.67
12	Understand the symbols or symbols used in BIP	4	4	3	3.67
13	Understand the terms used in this popular science book.	4	3	4	3.67
Amount		**46**	**41**	**48**	
Percentage (%)		**88,46**	**78,85**	**92.31**	
Average (%)			**86,54**		
Criteria			**Very Good**		

Table 2 Percentage of Readability Test

Percentage	Criteria
80,1%-100%	Very good
60,1%-80%	Good
40,1%-60%	Currently
20,1%-40%	Not good
0,0%-20%	Not very good

(Modified from Arikunto in Fatmawati, 2014)

The results of the readability test for the popular scientific book "Diversity of Mangrove Bush Plants in Tabanio Village" in Table 2 mention an average of 86.45% in the very good category. The results of the practicality of the student content indicate that the popular scientific books developed are suitable for further testing in an effort to improve students' critical thinking skills in studying Higher Plant Botany learning. The results of the student legibility test stage (one to one) of the popular scientific book Diversity of Mangrove Bush Plants in Tabanio Village aims to assess the appearance and presentation aspects of the popular scientific book "Diversity of Plants and Mangrove Bushes in Tabanio Village". At this stage, suggestions were obtained by 3 students who had taken the Higher Plant Botany course for improvement as shown in Table 3.

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The readability test aims to conduct an assessment by students who are users of the scientific book Diversity of Mangrove Bush Plants in Tabanio Village. The assessment is viewed from the readability component, interactive component, and ease of use component. This is in line with Akbar (2013) which states that individual tests or audience validation (students/readers) can be used in the assessment of a book, including this popular scientific book Diversity of Mangrove Bushes in Tabanio Village.

2. Implementation of Popular Scientific Books

The implementation of popular scientific books was obtained from a small test step carried out on 3 undergraduate biology education ULM students who had taken the Higher Plant Botany course. Student response data can be seen from Table 3.

Table 3 Implementation of Popular Scientific Books

No	Statement	Student Code		
		M1	M2	M3
1	Students read the front (table of contents, instructions and explanation of contents)	1	1	1
2	Students read the introductory information	1	1	1
3	Students read descriptions of general information	1	1	1
4	Students look at pictures and descriptions in popular scientific books	1	0	1
5	Students look at the writing on the colored boxes	1	1	1
6	Students read facts about the diversity of mangrove species	1	1	1
7	Students reading the glossary	0	1	1
8	Students use popular scientific books when making observations	1	0	1
9	Students use popular scientific books when analyzing data	1	1	1
Sub Quantity		**8**	**7**	**9**
Percentage (%)		**88.9**	**77.8**	**100.0**
Average (%)			**88.90**	
Criteria			**Very Good**	

Table 4 Student Response to BIP

No	Statement	Student Code		
		M1	M2	M3
1	The use of this popular scientific book makes me have a high willingness to follow the lesson	4	4	5
2	The use of this popular scientific book makes me have a high willingness to make good use of study time	4	4	5
3	The use of this popular scientific book makes it easier for me to understand the lesson	5	4	5
4	This popular scientific book is very interesting and not boring	5	4	5
5	This popular scientific book allows me to eliminate the misconceptions in myself	4	5	4
6	If the use of popular scientific books is carried out like this, I can remember the concepts from the lesson material longer	4	4	5
7	The use of this popular scientific book can help solve problems in everyday life related to learning topics	5	5	4
8	The use of this popular scientific book has broadened my horizons	5	4	5
9	If the learning of Higher Plant Botany is carried out with an inquiry model, it can improve learning achievement	4	4	5
10	If the study of Higher Plant Botany is carried out like this, it can increase the spirit of group work	5	5	4
11	This Higher Plant Botany lesson can improve my reasoning in studying the subject matter	5	5	4
12	This Higher Plant Botany lesson can help me think more critically	4	5	5
13	This Higher Plant Botany lesson can increase my creativity	5	5	5
14	This Higher Plant Botany lesson can make me feel more valued in expressing opinions	5	4	5
15	This Higher Plant Botany lesson made me have the courage to express my opinion	5	5	4
Acquisition Score		**69**	**67**	**70**
Percentage (%)		**87.0**	**88.33**	**90.33**
Average (%)			**88,16**	
Criteria			**Strongly Agree**	

Based on the results of the implementation test table in Table 3, it shows that the popular scientific book Diversity of Mangrove Bush Plants in Tabanio Village above, obtained 88.9% results

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with very good criteria. This shows that the popular scientific book Diversity of Mangrove Bush Plants in Tabanio Village is in a very good category to be used as enrichment material for Higher Plant Botany courses in an effort to improve students' critical thinking skills.

3. Student Response to BIP

The practicality of the popular scientific book Diversity of Mangrove Bush Plants in Tabanio Village was obtained based on the results of student responses to the practicality of expectations and actual as shown in Table 4.

Based on the results of student responses to the use of BIP, the score is M1 87.00%, M2 is 88.33% and M3 is 90.33% with an average number of 88.16% so that the criteria are strongly agreed by the students.

The results of the readability test, implementation and student responses of the scientific book that was developed were declared practical to be used by students because it had several advantages such as being easy to understand, the presentation of clear plant pictures making it easier for students to understand the material being studied. It is very important to do a product development practicality test before the product is used to measure its effectiveness. This is evidenced by research on the development of teaching materials reported by Dharmono et al. (2019) which developed the Tabanio Coastal Forest Plant Population Handout as an Enrichment Material for the Plant Ecology Course.

The purpose of using popular scientific books developed to improve critical thinking skills with predetermined indicators is to make it easier for students to understand BTT lecture material. Based on students' opinions on the use of popular scientific books in studying BTT, they stated that it was easier for students to learn and understand the material presented with teaching materials in the form of popular scientific books. Students are of the opinion that studying plants using popular scientific books containing descriptions and pictures can facilitate students in determining plant characteristics and the process of plant identification.

This is also expressed in several studies which include Fitriansyah et al. (2018) which states that popular scientific books were developed with a very practical category which means that they are very easy to use and use in learning. Students think that studying using popular scientific books is very useful and fosters interest in participating in BTT learning activities which have been known as boring subjects. This is in line with Dharmono (2011) statement It was found that the cause of BTT learning was boring because the material was standard and did not develop. The pictures contained in popular scientific books make learning in BTT courses not boring and even more interesting. Popular scientific books can foster a positive attitude for BTT courses so that students strongly agree to use popular scientific books as teaching materials for BTT learning.

The advantages of the popular scientific books that have been developed make this teaching material very practical because the advantages of the popular scientific books that were developed contain material on the types of mangrove shrubs that are found around students, especially those who live in settlements close to the mangrove forest of Tabanio Village. Popular scientific books that have been developed contain descriptions of their characteristics and benefits, along with the pictures shown in popular scientific books are pictures with original colors that match the original plants, making it easier to identify the species of shrubs being studied. The presentation of popular scientific books developed is arranged in such a way as to make it easier to understand and learn. According to Lucardie (2014) interactive and fun learning is considered a mechanism that encourages students' concentration and helps in the absorption of learning materials.

Based on the description of students' responses to the practicality of popular scientific books developed, the elements of practicality of popular scientific books have been fulfilled. Based on practicality data, there are still students who say no to the field test. This is thought to be caused by the characteristics of students who are the subjects in this study. As stated by Sudjana (2002), that each individual student is individualism where each has intellectual skills, talents, interests, and their respective characters in terms of learning.

The relevant research has been studied by Dharmono et al. (2019) which developed a Handout with an average result of 91.1% which shows the criteria for strongly agreeing by students so that popular scientific books developed can improve students' critical thinking skills.

D. Conclusion

The popular scientific book that was developed was stated to be practical for use in Higher Plant Botany learning based on the results of the student readability test with an average score of 86.54% in the very good category. The implementation of BIP by obtaining an average score of 88.90% in the very good category. Meanwhile, the student response scored 88.16% which indicates that

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students gave a positive response to popular scientific books (BIP) so that popular scientific books are practically used by students.

The development of this popular scientific book can improve critical thinking skills as shown by the results of research showing moderate N-Gain so that this popular scientific book can be used as enrichment material for BTT courses.

The limitation of this research is that the material contained in this book is less extensive, so that only certain materials are studied. So that further research is needed for the development of BIP with broad material.

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