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The Practicality And Validity Of The Popular Scientific Book Development “Survival Plants”

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Abstract: The popular scientific book was developed to construct the reader's knowledge in recognizing survival plants in the forest. The purpose of the development of this book was to help in identifying the wild plants that can be consumed and used as medical material directly in the forest. Besides, the development process, the practicality and validity stages of popular scientific books were intended to assess the exactness and easiness of the use of these popular scientific books. Meanwhile, in this research used development method which ADDIE development design and it was consisted of the stages of Analyze, Design, Develop, Implement, and Evaluate. However, in practicality and validity tests were only carried out at the Develop stage. The material and media validity were tested by the media and material expert team. The instrument was used a validation questionnaire. The practicality level testing was carried out on 25 student's mountaineering community and this used questionnaire instruments and interview sheets. The research data were analyzed descriptively. Thus, based on the results of the research at the material validation stage it is known that the book has an average value of 100% and it means that the book material has been very good and appropriate. Furthermore, the results of the validator's assessment on the design indicators of the contents of the book got an average value of 94.10% with a very good category. The practicality test results were obtained 92.68% with very good category.

Index Terms: Practicality, Validity, and Popular Scientific Books.

1. INTRODUCTION

KNOWLEDGE can be obtained through formal and non-formal education. Through education, it can be conveyed to the mountaineering community about knowledge to recognize and to identify plant species that can be utilized by humans (Meunick, 2013), for example for being consumed (Teketay et al., 2010; Lulekal et al., 2011; Neudeck et al., 2012; Estrada -Castillo, 2014), and doing treatment (Della et al, 2006; Collins, 2007; Cruz-Garcia & Price, 2011; Kang et al., 2014; Andika et al., 2015; de Figueirêdo et al, 2015). This knowledge is needed to avoid mistakes in the use of the plants (Gerke, 2010; Meunick, 2013). This knowledge can be conveyed through a book form of media. A book is a reading source that contains materials that can be a reference in conveying information (Peters, 2010). According to Suhardjo in Chotimah (2009) a book can contain facts and objective data written concisely and clearly. One of the books developed is a popular scientific book. Popular scientific books are a means of communication between science and society (Saipurrahman, 2014). This book is expected to be able to help students in constructing their knowledge about survival plants (Budiningsih, 2005). This book will contain material

about survival plants obtained from research results. Survival plants can be interpreted as plants that can be used for a survival in the forest. Plants that can be consumed are a very important source during the survival process (Gerke, 2009). However, in using these plants, high knowledge is needed to avoid mistakes in identifying (Gerke, 2009) Knowledge of survival plants identification can be in the form of recognizing the physical characteristics of the plants, knowing the habitat of the plants and the parts of plants that are used (Brett & McKay, 2010), by having this knowledge, nature-lovers are not wrong in choosing the types of plants in the forest (Meunick, 2013; Nyerges 2016). On the knowledge of the use of survival plants, plant parts that can be used are all or a part of plant parts (Luczaj, 2008; Liu et al, 2013; Singhal & Kumar, 2013). Reader being bored. Books that have been developed need to be validated before being given to nature-lovers. The book is validated by media and material experts. Furthermore, the books that have been valid are tested on nature-lovers. The development of this book aims to support progress in education, especially in the use of plant species in the forest.

2 RESEARCH METHODS

Popular scientific books were developed by adapting the ADDIE model (Branch, 2009). ADDIE is an acronym for the words Analyze, Design, Develop, Implement, and Evaluate. The reason to choice of this model was because the ADDIE concept were more flexible, simple and appropriate for the development of educational products or learning resources (Branch, 2009). This research is only limited to activities, namely the practicality and validity test in the Develop stage.

2.1 Validity Test

This stage is validating the media that have been developed. Validation is done by media and material experts. Then, the final score was calculated from the assessment. If the score indicates that the value is not valid yet. Then, a formative revision will be made on the book content section.

2.1.1 Data Analysis

The validation of this research were used qualitative and quantitative data analysis in then qualitative descriptive

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analysis was based on suggestions and comments from the results of expert material review, expert development of non-textbook lessons and the results of interviews with mountaineering community. Next, the quantitative data was obtained from validation scores and answer sheets of questions given to mountaineering community. Quantitative analysis was used to obtain percentage data using the formula:

$$P = \frac{\sum xi}{\sum x} \times 100\%$$

Information :

P : Assessment Percentage

$\sum xi$: Total Score from the Validator or Trial Subject

$\sum x$: The Highest Number of Answer Scores

The feasibility of the validated product is determined by the quality of its eligibility by determining the assessment criteria. Referring from Purwanto (2009) the eligibility criteria are as follows:

90% - 100% = very valid

80% - 89% = valid

65% - 79% = quite valid

55% - 64% = less valid

0% - 54% = invalid

2.2 Practicality Test

At this stage, it can be done if the book has been declared valid based on measurements that have been made. A preliminary trial was conducted to mountaineering community to find out the value of the readability of the book that is developed.

2.2.1 Research Sample

The number of respondents was used 2 people from each mountaineering community, which were totally 25 respondents. This amount was based on the reference standard ADDIE book (2009) which states that for small group trials sufficient is enough to be given to 8-20 respondents. For papers accepted for publication, it is essential that the electronic version of the manuscript and artwork match the hardcopy exactly! The quality and accuracy of the content of the electronic material submitted is crucial since the content is not recreated, but rather converted into the final published version.

2.2.2 Data Analysis

At this stage, to calculate the percentage of all aspects of the

No	Assessment indicators	Percentage
1	Book is easy to be read	100
2	The contents of the book are easy to be understood	100
3	The accuracy of the use of sentences	98
4	Book design display	100

assessment used the formula:

Table 4.7 Results of Media Expert Validation

Information:

P : Percentage Rating

$\sum p$: Total Percentage of All Aspects of the Assessment

N : total components

The feasibility of the product being measured was determined by the quality of its eligibility by determining the assessment

criteria refer to Purwanto (2009) the eligibility criteria as follows:

90% - 100% = very valid

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55% - 64% = less valid

0% - 54% = invalid

4 RESULTS AND DISCUSSION

4.1 Media and Material Validation

4.1.1 Formative Test Result by Material Experts

The results of the validation of the material in the form of assessments, suggestions, and criticisms related to the material written in the book. The material referred to this book is a description of species, habitat and utilization of survival plants.

The results of the validation by material experts can be seen in table 4.6.

NO	Indicator	Score	Category
1	Content Eligibility		
a	Accuracy of facts	100	Very Good
b	Up to date and contextual	100	Very Good
2	Presentation Eligibility		
a	Presentation technique	100	Very Good
b	Supporting Presentation	100	Very Good
c	Completeness of presentation	100	Very Good
3	Language worthiness		
a	Correspondence with respondents	100	Very Good
b	Legibility	100	Very Good
c	Straightforwardness	100	Very Good
d	Conformity with the correct Indonesian rules	100	Very Good
e	Use of terms and symbols	100	Very Good
Average material expert judgment		100	Very Good

From the results of the material validation it was known that the book material has an average value of 100%, it means that the book material has been very good and appropriate. This book contains materials about consumption and medicinal plants, so that maximum value was expected in the development process. With the results of the assessment, this book does not need to be revised again (Purwanto, 2009).

4.1.2 Formative Test Result by Media Experts

Media validation is intended to obtain data in the form of assessments, suggestions and criticisms of popular scientific books that had been developed. Media validation indicators include books size; books cover design and book content design. The validator of this book was Dr. Munzil, S.Pd, M.Sc. The results of the validation in detail can be seen in Table 4.7.

From the results of the validation by media experts it was known that the book has been designed very well. This was evidenced by the average book rating of 92.58% with a very good category. The assessment of each indicator shows that the book cover indicator got a value of 87.5% with a very good indicator, for the assessment of the book leather design it got an average value of 90.97 with a very good indicator, and the results of the validator assessment on the book content design, the indicator got an average value of 94.10% with very good category.

4.1.2 Discussion of Product Revision Result After Validation

The final product that has passed several revisions was the main product of the results of development research conducted by the researchers. The book presentation includes the outer title sheet and the inner title sheet using Elephant letters of varying sizes. The headline of 'Survival Plants' uses the Elephant letter with a size of 60. In writing the author's name uses the Elephant letter with a size of 22. Writing plants explorations using the Elephant letter with a size of 10. On the back cover used the size of the letter 25 for the writing 'Survival Plants'. A brief illustration of the book on the back covers using the Bell MT letters with the size of 12. On the middle cover uses the Arial letter with the size of 12 for the author's name and size 24 for writing 'Plant Survival'. The inside cover of the book uses Times New Roman letters with different writing sizes based on the writing. In writing the title 'SURVIVAL PLANTS' uses the letter of size 36, for writing 'plant exploration' uses letters size 14, and for writing the names of writers, editors and universities use letters with size 24. The following cover illustrations in popular scientific books with the title 'Survival Plants'.



Figure 1 Cover the initial draft



Figure 2 Final cover after revision

In the Foreword section, table of contents, introduction, utilization of survival plants and recognizing survival plants, the writing uses Times New Roman letters with size 14 and bold form with Title in the section using capital letters. In the

contents of this book, writing the name of the species and the name of the area uses Arial letters with the size 28 and colored need with a transparent black background of measuring 18.46 cm and 3.37 cm with a transparent portion of 35%. In the photo section the collision parts (Leaf / Flower / Stem / Fruit / Root) use photo captions using the Castellar Font with a size of 14 with a rectangular background measuring 4.27 cm length and 0.84 cm width. In the Description part, Habitat and Utilization section use Castellar letters with the size 22 with a blue square background measuring 6.22 cm length and 1.3 cm width. In the bibliography and profile the author uses Times New Roman letters with size 14.



Figure 3 Section Content of the Book

At this stage improvements were made of the book section based on input from the validators. Some things that are suggested to be revised can be seen in table 4.11

Table 4.11 Product Revision Results Based on Validator Input

No	Criticism	Revision
1	On the cover there should be a university identity	Addition of college logo (UM) on the cover
2	The title on the back of the book needs to be given	Giving the title on the back of the book
3	The letters of the preface and introduction need to be enlarged	Increase the size of the letters in the introduction and preface to the book
4	Image captions need to be added	Add caption to the book
5	There are some writing errors on the book	Improving the writing on the book
6	The material needs to be adjusted to the plant book so that no description errors occur.	The contents of the book are improved and adjusted to the literature, such as flora of java, Indonesian useful plants and books Edible Wild Plant and medicinal plants

4.1 Practicality Test Result (Readability)

Readability test conducted on 25 respondents from mountaineers club, this aimed to get an assessment and suggestions about the ease of readers in understanding the book, the accuracy of the use of sentences, and display design of the book. The results of the trial readability can be seen in table 4.8

Table 4.8 Readability Test Results

No	Indicator	Score	Category
1	Book size	87.5	Good
2	Leather book design		
a	Book leather layout	87.5	Good
b	Book leather typography	93.75	Very Good
c	Leather book illustrations	91.67	Very Good
Average indicator 2		90.97	Very Good
3	Book content design		
a	Layout of the contents of the book	92.31	Very Good
b	Typography of book content	100	Very Good
c	Illustration of the contents of the book	90	Very Good
Average indicator 3		94.10	Very Good
Total score indicator		152	
Average percentage valued of the indicator		92.68	Very Good

Table 4.8 shown that this book used sentences that were easy to read and understand by the reader and the design used was very precise and based on the presentation of the contents of the book. This book is written concisely and adapted to the reader. Thus, the book does not seem boring to read or understand.

4 CONCLUSION

Based on the results of practicality and validity tests of popular scientific books on survival plants material it was known that this book has been developed very well. The validation stages of the material are known, books have an average value of 100% and it means that the book material has been very good and precise. Furthermore, the results of the validator's assessment on the design indicators of the contents of the book got an average value of 94.10% with a very good category. The practicality test results obtained 92.68% with a very good category. This was evidenced by the results of validation with media experts and material experts along with trials on students' mountaineering club.

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