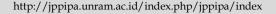


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The Development of Reference Book from Medicinal Plant Exploration Results in Rote Tengah Sub-district, Rote Ndao District

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Abstract: The utilization of medicinal plants has become one alternative for communities to treat illnesses. This is because the use of medicinal plants, besides being relatively affordable, also does not cause side effects compared to the use of modern medicine or chemical-based drugs. This study aims to develop a reference book of medicinal plants in Rote Tengah Sub-district, Rote Ndao District. The development model used in this research is the ADDIE model (analysis, design, development, implementation, evaluation). The research results obtained from material expert testing showed a validity of 94.6%, design expert testing showed 95.5%, and media expert testing showed 100%. Overall, the percentage of assessments from all three experts indicates a value of 96.7% with a qualification of very valid (highly appropriate). This indicates a positive response to the developed medicinal plant reference book, which is deemed suitable for use as a learning resource. This is because the developed medicinal plant reference book has its own advantages, where the illustrations in the reference book are made with attractive designs, thus attracting students' attention and making it easier to understand.

Keywords: Medicinal Plants; Reference Book; Rote Ndao

Introduction

Indonesia is a tropical country located in Asia with a high level of flora diversity (Elizabeth et al 2014). Indonesia has more than 9,609 types of plants that can be used as medicine, and around 300 types have been utilized for traditional medicine (Wasito, 2008)

Medicinal plants are plants that have medicinal properties to cure various types of illnesses. Traditional medicinal plants used for treating diseases have been passed down from previous generations. Many communities still use traditional medicinal plants as first aid when ill (Kinho et al., 2011).

The utilization of medicinal plants often faces challenges such as the availability of medicinal plants, as most of the utilized plants are wild and not cultivated (Indrawati et al., 2015), and there is a lack of knowledge among the younger generation about the utilization and

management of medicinal plants. Only the elderly and those trusted by the community can prepare these medicinal plants (Sada & Tanjung, 2010).

There are many medicinal plants in the Rote Tengah Sub-district, and the surrounding communities still utilize them to cure various diseases. The utilization of plants as medicine has been passed down through generations (Gustina, 2014). Most of these medicinal plants are directly sourced from forests or gardens (Wahidah, 2013). One reason why communities still use traditional medicinal plants is because they have no side effects and can be used as first aid when ill (Grenvilco et al., 2023). Community knowledge about plants as traditional medicine ingredients is declining. This is due to the lack of knowledge among the community, especially the younger generation in Rote Termanu, regarding these traditional medicines. Knowledge transmission has been primarily oral within families,

and this information is not widely disseminated, leading to knowledge erosion in subsequent generations. One effort to prevent this from continuing is by providing education to the younger generation and the general public, especially for students as an academic group, to support learning in higher education in relevant courses such as plant taxonomy concerning types of medicinal plants including classification, plant descriptions, utilization, parts of the plant used as medicine (Falah et al., 2013) processing methods, and their benefits, in the form of a specific medicinal plant reference book in the Rote Tengah Sub-district community (Termanu community), Rote Ndao District.

A reference book is scientific writing poured into a book form with its discussion substance focused only on one field of study (Pratama, 2022). Although a reference book focuses on one field of study, the discussion inside it covers a fairly broad topic. The sequence of material and structure of the textbook are arranged based on the logic of the field of study (content-oriented). The content of the book is the result of research relevant to the field of study (Mailani et al., 2022).

The reference book is presented in the form of images and text. This book is created for students, greatly aiding the learning process, and enabling them to understand and enrich their experience in the taxonomy of plants course.

The importance of this reference book is highly regarded as the primary media. Nearly every educational institution, from the most basic to the highest levels, generally employs books as learning resources (Steenis, 2005). This also proves that the existence of reference books remains an integral part of the learning process in various educational institutions today. Reference books are also a crucial part of learning activities (Wahyuni et al., 2022).

Based on the analysis of student needs and interviews with the lecturers teaching plant taxonomy in the Biology Education Study Program, the teaching materials used to study plant types are limited to books and materials provided by the lecturers. This makes it difficult for students to study material about medicinal plants due to the lack of teaching materials, especially when studying the types of medicinal plants (Husain, 2015). Therefore, there is a need for a reference book that can be used as a learning resource for students to understand plant types, the classification of medicinal plants, morphology, benefits, processing methods, and the parts used in medicine (Nikmah Hidayah, 2023). Additionally, these teaching materials must have an attractive design to make learning more engaging (Santoso, 2012)

This developmental research aims to determine: 1) the types of medicinal plants in Rote Tengah Subdistrict, Rote Ndao District, and 2) the feasibility of the

medicinal plant reference book in Rote Tengah Subdistrict, Rote Ndao District.

Method

This research is designed with a research and development approach, known as Research & Development, which is the process of developing and validating an educational product. This research uses the ADDIE model consisting of five steps: Analysis, Design, Development, Implementation, and Evaluation (Purwanto, 2012).

In the development of the reference book, not all steps in the ADDIE model are utilized. The steps used are as follows.

- 1. Analysis: At this stage, an analysis of the needs of third-semester Biology Education Study Program students regarding the reference book is conducted, along with interviews with plant taxonomy course lecturers in the Biology Education Study Program at Artha Wacana Christian University.
- 2. Design Stage: At this stage, material selection is carried out by analyzing the material to be developed, namely, material about medicinal plants. The process of determining the material to be developed is based on several considerations, including the background of the problem, learning theory studies, and research results. The development of the Medicinal Plant reference book in Rote Tengah Sub-district, Rote Ndao District, considers relevant reference book components, resulting in a reference book that is easy for students to learn from. Material analysis in the reference book is as follows:
 - a. Reviewing various sources related to the material needs of the lesson.
 - b. Analyzing reference books reviewed based on language accuracy, facts/data, concepts, generalizations, presentation accuracy, illustrations, and material comprehensibility.

In preparing and writing this lesson material, the focus is on the components of the reference book, which is a non-textbook, making it easy for students to learn from (Widodo, 2015). The components in the development and writing of lesson materials include: (1) the beginning part consisting of the correct Indonesian title of the book; foreword; and table of contents; (2) the content or material section, consisting of descriptions that are in line with the title of the book; (3) the ending part consisting of references (mandatory, except for fictional personality enrichment books); glossary; index (mandatory for atlas-type books) (Dalimartha, 2008).

- 3. Product Development Stage: This activity aims to develop a reference book on medicinal plants in Rote Tengah Sub-district, Rote Ndao District. This reference book discusses the morphology of plant types, classification, parts of the plants utilized, processing methods, and their benefits. The development stage aims to produce a reference book as a learning resource that has been revised based on input from experts (Dien, 2019). This stage is called Expert Validation. Expert validation serves to validate the material in the media before testing, and the validation results will be used to revise the initial product. The media that has been prepared will then be assessed by material expert lecturers, media experts, and design experts to determine whether the media is suitable for implementation or not. The results of this validation are used as improvements for the perfection of the developed media.
- 4. Product Revision: The results obtained from validation by material expert validators, design experts, and media experts will be used as a reference for revising the previously produced reference book. The final product of the development is a reference book. This product is the result of revisions that meet validation criteria, so the product will have relevance and be suitable for use as a supplementary book for the plant taxonomy course. Testing is conducted after the product is declared valid and suitable by material expert validators, design experts, and media experts.

The data in this research are both quantitative and qualitative. Quantitative data are obtained through assessment scores in the form of percentages from material experts, design experts, and media experts. All of this data will be used for reflection in the preparation of the medicinal plant reference book in Rote Tengah Sub-district, Rote Ndao District. Qualitative data are obtained from suggestions and general comments provided by material expert validators, design experts, and media experts. The data collection instruments used in this developmental research are validation sheets and questionnaires.

Data analysis techniques used to process data from the reviews of expert validators include qualitative data analysis and quantitative data analysis. Qualitative data analysis is used to process data in the form of suggestions and general comments from material expert validators, design experts, and material experts. Quantitative data analysis was obtained from the assessment instruments by material experts, design experts, and media experts, as well as student questionnaires. There are 4 rating scales in the instrument sheet: STV (very invalid), TV (invalid), V (valid), SV (very valid). STV is valued at 1, TV at 2, V at 3, and SV at 4. The percentage results obtained from the

research by validators and respondents are then converted using a qualification table for the level of suitability of the development product that refers to the criteria interpretation data table below.

Table 1. Qualification of achievement level

Range	Qualification	Information
0%-20%	Very invalid	Revision
21%-40%	Not valid	Revision
41%-60%	Fairly valid	Revision
61%-80%	Valid	No need for revision
81%-100%	Very valid	No need for revision

Source: Purwanto, 2012

Results and Discussion

Exploration Results

Based on the results of exploration and interviews with the community/respondents in Rote Tengah District, Rote Ndao Regency, it was found that there are 64 types of plants that are used as medicine by the community. People in Rote Tengah District, Rote Ndao Regency, still use many parts of the leaves of plants with medicinal properties to cure various diseases (Ketut Sudirga, 1992; Jamun et al., 2020).

Handayani, (2015) said that leaves are one of the most important organs for plants because leaves contain green leaf substance (chlorophyll) which is very useful for plants as a photosynthetic organ. Leaves also act as a place for gas exchange (respiration), as a place for the transpiration process and as a means of vegetative reproduction (Lathifatul, 2023).

Development Results

This developmental research resulted in a medicinal plant reference book in Rote Tengah Subdistrict, Rote Ndao District. The development process of this reference book is based on the 4D research model consisting of Define (research), Design (design), Development (development), and Dissemination (testing). The stages of developing this reference book are as follows:

Data Presentation

Data presentation on the results of developing the medicinal plant reference book in Rote Tengah Sub-district. Based on the design results conducted in the development of the medicinal plant reference book in Rote Tengah Sub-district, Rote Ndao District, can be seen in Figure 1.

The data generated were obtained by evaluating each expert consisting of 1 media expert, 1 design expert, and 1 subject matter expert. Data in the development process were obtained using instruments in the form of

questionnaires and suggestion columns provided to each expert.



Figure 1. (a) Front cover of the book, (b) book content

Research results on the development of the medicinal plant reference book will present data on the analysis of needs and evaluations by subject matter experts, media experts, and design experts. To obtain data, researchers used data collection instruments in the form of questionnaire surveys.

Based on the overall analysis of student needs, 95% indicates that third-semester students greatly need a medicinal plant book to be used in the learning process.

Data Analysis and Product Revision Expert Material Evaluation

The product design created by the researcher was evaluated by Ms. Andriani Rafael, S.Si, M.Si, Ph.D., as the subject matter expert. The subject matter expert provided assessments by scoring each question in the questionnaire provided by the researcher. The subject matter expert assessed that the content of this product is suitable for use as a learning resource.

The results obtained from the subject matter expert are in the form of quantitative and qualitative data. The interpretation of the subject matter expert's assessment results on the medicinal plant reference book in Rote Tengah Sub-district, Rote Ndao District, can be seen in Table 2.

The data from the assessment of the subject matter expert on the medicinal plant reference book found in Table 2, interpretation of the subject matter expert's assessment results, obtained a result of 94.6% with a qualification of very valid (highly appropriate). Based on the assessment results of the subject matter expert, there are several aspects: 1) The aspect of book and material suitability obtained 100% with a qualification of very valid (highly appropriate), 2) The presentation aspect obtained 87.5% with a qualification of very valid (highly appropriate), 3) The aspect of the function and benefits of the illustrated book obtained 91.6% with a qualification of very valid (highly appropriate).

Table 2. Interpretation of Subject Matter Expert Assessment Results on the Medicinal Plant Reference Book in Rote Tengah Sub-district, Rote Ndao District

Aspect	Eligibility	Eligibility
rispect	percentage	Qualifications
	(%)	~
Suitability of Books and	100	Very valid
Materials		
Presentation	87.5	Very valid
Functions and Benefits of	91.6	Very valid
Reference Books		
Average Material Expert	94.6	Very Valid
Validation Results		

Design Expert Evaluation

The product design created by the researcher was evaluated by Mr. Agus M. Meha, S.Pd., M.Si as the design expert. The design expert provided assessments by scoring each question in the questionnaire provided by the researcher. The design expert assessed that the content of this product is suitable for use as a learning resource. The results obtained from the design expert are in the form of quantitative and qualitative data. The design expert's assessment results on the medicinal plant reference book in Rote Tengah Sub-district, Rote Ndao District, can be seen in Table 3.

Table 3. Interpretation of Design Expert Assessment Results on the Medicinal Plant Reference Book in Rote Tengah Sub-district, Rote Ndao District

Aspect	Eligibility	Eligibility
Aspect	0 ,	0,
<u></u>	percentage (%)	Qualification
Physical appearance	95.4	Very valid
Designing	91.6	Very valid
Illustration	100	Very valid
Functions and Benefits	100	Very valid
of Reference Books		-
Average Design	95.5	Very Valid
Expert Validation		
Results		

The data from the assessment of the design expert on the medicinal plant reference book, as interpreted in Table 3. The medicinal plant reference book obtained a result of 95.5% with a qualification of very valid (highly appropriate). Based on the assessment results of the design expert, there are several aspects: 1) The aspect of physical appearance obtained a result of 95.4% with a qualification of very valid (highly appropriate), 2) The aspect of design obtained a result of 91.6% with a qualification of very valid (highly appropriate), 3) The aspect of illustration obtained a result of 100% with a qualification of very valid (highly appropriate), 4) The aspect of the function and benefits of the reference book

obtained a result of 100% with a qualification of very valid (highly appropriate).

Media Expert Evaluation

The product design created by the researcher was evaluated by Ms. Eltina Maromon, S.Pd, M.Pd as the media expert. The media expert provided assessments by scoring each question in the questionnaire provided by the researcher. The media expert assessed that the content of this product is suitable for use as a learning resource. The data obtained from the media expert are in the form of quantitative and qualitative data. The media expert's assessment results on the medicinal plant reference book can be seen in Table 4.

Table 4. Interpretation of Media Expert Assessment Results on the Medicinal Plant Reference Book in Rote Tengah Sub-district, Rote Ndao District

Aspect	Eligibility	Eligibility
_	Percentage	Qualification
	(%)	
Media Display	100	Very valid
Content and purpose of	100	Very valid
Media		
Media Linguistics	100	Very valid
Average Media Expert	100	Very valid
Validation Results		•

The data from the research evaluation by the media expert on the medicinal plant reference book is interpreted in Table 4. The medicinal plant reference book obtained a result of 100% with a qualification of very valid (highly appropriate).

Based on the assessment results of the media expert, there are several aspects: 1) The aspect of media appearance obtained a result of 100% with a qualification of very valid (highly appropriate), 2) The aspect of media content and purpose obtained a result of 100% with a qualification of very valid (highly appropriate), 3) The aspect of media language obtained a result of 100% with a qualification of very valid (highly appropriate).

Next, the researcher calculated the overall objects, which are the frequencies or responses to the medicinal plant reference book from the subject matter expert, design expert, and media expert (Arikunto, 2007), with the total overall as follows:

r1 % = (Subject matter expert + Design expert + Media expert) / Total number of trials

$$= (94.6 + 95.5 + 100) / 3$$

 $= 96.7\%$

Based on the overall total of 96.7%, the medicinal plant reference book indicates a qualification of very

valid (highly appropriate). The decision-making regarding the suitability of this medicinal plant reference book refers to the level of achievement qualification by Purwanto (2012).

Book Revision

The book revision was done according to the general suggestions and comments from the subject matter expert, design expert, and media expert (Prasetiyo & Perwiraningtyas, 2017).

Discussion

This developmental research resulted in a product in the form of a medicinal plant reference book in Rote Tengah Sub-district, Rote Ndao District. The development model used in this research is the ADDIE development model with five stages: analysis, design, development, implementation, and evaluation.

The process of developing this reference book is based on the 4D research model consisting of Define (research), Design (design), Development (development), and Dissemination (testing). The development of the medicinal plant reference book in Rote Tengah Sub-district, Rote Ndao District, provides knowledge for readers and students. After this book is developed, the next step is to test the validity or suitability of the medicinal plant reference book. There are three important aspects considered in the validation testing phase: validation testing in terms of content, design, and media (Akbar, 2013).

Validation testing in terms of content obtained 94.6% with a qualification of very valid (highly appropriate), based on three aspects. First, the aspect of the book and the material's suitability support each other, observed from the images displayed in the book matching the types of medicinal plants obtained. The language used is easily understood, and the media of the medicinal plant reference book created is related to the material systematics and aligned with the book's objectives. Second, the presentation of the material is very good and clear because the arranged material is accompanied by appropriate plant images, presentation, classification, and descriptions of plants, allowing readers to acquire good knowledge when using the medicinal plant reference book. These are some of the assessments from the subject matter expert on the developed medicinal plant reference book. After conducting the subject matter expert validation, the researcher then conducted validation testing in terms of design.

Design validation testing resulted in 95.5% with a qualification of highly valid (very suitable). This is based on four aspects: firstly, the aspect of physical appearance/design is very appealing because overall, the design of the medicinal plant reference book is

attractive when viewed. Secondly, the design aspect includes choices of color, size, and an exciting storyline and layout of the book's content. Thirdly, the illustration aspect includes illustrations in the medicinal plant reference book that aligns with the developed material. Fourthly, the aspect of the book's function and benefits can enhance readers' knowledge to utilize plants around their homes as medicine. These are some of the assessments from the design expert regarding the developed medicinal plant reference book (Sulton, 2013). After validating the design aspect, the researcher validated the media aspect.

Media validation testing resulted in 100% with a qualification of highly valid (very suitable) and no revisions are needed. This is based on three aspects: firstly, the aspect of media appearance/physical appearance of the reference book looks simple but practical for use in explaining the material because the sequence of the medicinal plant material mechanisms is systematically arranged and easy to understand (Abidin, 2014). Secondly, the aspect of media content and purpose, the content and purpose of using the book are very easy to understand because clear images and words are used. Thirdly, the aspect of media language is assessed using language that is easy to understand according to proper Indonesian language methods.

The assessment of the medicinal plant reference book as outlined above indicates that the development of the medicinal plant reference book received positive responses from subject matter experts, design experts, and media experts, thus indicating that the developed reference book is suitable for testing and as a learning resource for biology students.

The feedback from the subject matter expert aligns with the theory presented by (Prastowo, 2011) about the benefits of reference books that can enrich readers' and students' knowledge and motivate students to be more interested in media in learning. Strengths align with the assessment from the design expert stating that this reference book has an attractive design with various techniques and colors, thus attracting the reader's attention.

The decision-making regarding the suitability of this medicinal plant reference book refers to the achievement qualification according to (Riduwan, 2012), which states that if the percentage obtained is \geq 61%, then this developed medicinal plant reference book is suitable for testing as a learning resource.

The medicinal plant reference book product for the Termanu village community has been revised according to the components of the front cover, back cover, core content, language usage, front cover design, and content, as seen in Figure 1. This reference book contains 64 types of medicinal plants used by the Termanu village community.

Conclusion

This research concludes that there are 64 types of medicinal plants in Rote Tengah Sub-district, Rote Ndao District. From the assessment and validation results by subject matter experts, design experts, and media experts, it can be concluded that the overall assessment results obtained a percentage of 96.7%, categorized as highly valid. This indicates that the developed medicinal plant reference book is suitable for testing and further use as a student learning resource.

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Author Contributions

All authors had significant contributions in completing this manuscript

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Conflicts of Interest

The authors declare no conflict of interest

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