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Development of an ethnobiology supplement book based on the study of medicinal plants in Wonawa District, Kepulauan Yapen Serui Regency

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Abstract: This study aims to produce a supplement book for ethnobiology courses based on research on traditional medicinal plants in Wonawa District, Kepulauan Yapen Serui Regency. The type of research is research and development. The ADD (analysis, design, and development) stage of the ADDIE model is applied to the development of supplement books. Interviews are used for data collection and identification of medicinal plants. Experts validate books made while students fill out response questionnaires. The validity criteria for supplement books with a value of 88.63% based on the findings of the research are Very Valid. In the Excellent category are responses to supplement books from students with an average rate of 87.5%. The developed supplement book can be used for student learning because it fulfills the valid criteria and the response has been overwhelmingly positive.

Keywords: Ethnobiology, local wisdom, supplement book, traditional medicinal plant

Abstrak: Penelitian ini bertujuan untuk menghasilkan buku suplemen mata kuliah etnobiologi berdasarkan riset tanaman obat tradisional di Kecamatan Wonawa Kabupaten Kepulauan Yapen Serui. Jenis penelitian adalah penelitian dan pengembangan. Tahap ADD (analysis, design, and development) dari model ADDIE diterapkan pada pengembangan buku suplemen. Wawancara digunakan untuk pengumpulan data dan identifikasi tanaman obat. Pakar memvalidasi buku yang dibuat sementara siswa mengisi angket tanggapan. Kriteria kevalidan buku suplemen dengan nilai 88,63% berdasarkan temuan penelitian adalah sangat valid. Pada kategori sangat baik hasil respon siswa terhadap buku suplemen dengan rata-rata nilai respon 87,5%. Buku suplemen yang dikembangkan dapat digunakan untuk pembelajaran siswa karena memenuhi kriteria valid dan responnya sangat baik.

Kata kunci: Etnobotiologi, kearifan lokal, buku suplemen, tanaman obat tradisional

INTRODUCTION

Teaching materials are a collection of subject matter used to accomplish predetermined competency standards and fundamental competencies. Teaching materials are very useful for educators and students. Learning facilities are tools and equipment that are directly used and support the educational process, one of which is the use of teaching materials (Fitriani & Setiawan, 2018). Learning using teaching materials based on local wisdom as a whole shows good results in student learning activities (Suwarni, 2015). Several factors make it difficult for students to learn biology, including because the material is abstract, contains several foreign terms that are not understood, concepts are learned too

much, and some concepts are difficult to understand (Damopolii, Botutihe et al., 2019; Fauzi & Fariantika, 2018). To overcome this problem, teaching materials are needed. Adequate learning resources for delivering material are supported by carrying out an interesting learning process that enables students to learn actively (Damopolii et al., 2022), improve cognitively (Fitriani et al., 2019; Lelasari et al., 2021; Utami & Dewi, 2021), thinking (Nusantari et al., 2021), and their skill (Mandasari et al., 2021; Sriyati et al., 2021).

One of the topics discussed in ethnobiology is ethnobotany. Ethnobotany is a field of science that explains the relationship between culture and the uses of plants, such as for medicines, food ingredients, dyes, traditional ceremonies, clothing and cosmetics (Cock & Van Vuuren, 2020; Syafitri et al., 2014). The study of knowledge in local communities about botany is called ethnobotanical science. It revolves around the use of plants by the people around them, and their applications can increase human vitality (Kandowangko et al., 2014). The use of medicinal plants by local people is something new and there is already a field of science that studies the direct relationship between humans and plants in their traditional use, which is called ethnobotany (Agize et al., 2013; Bibi et al., 2014; Eni et al., 2019). The course is an elective, allowing students to learn about plants and their uses for human life.

Based on the results of initial interviews with students in the ethnobiology subject, it was found that in teaching and learning activities, students in the ethnobiology especially in ethnobotany topic currently still often take samples of medicinal plants from outside Papua. Teachers still don't introduce many medicinal plants, especially medicinal plants typical of Papua. This is due to the lack of availability of teaching materials as a reference in each learning process. Currently students are only focused on material that only contains examples of plants that exist outside the Papua region, which are delivered by lecturers or papers presented during class discussions. Even though in attending lectures, students should be able to dig up the detailed information needed. Students can search for learning resources that can be used as a guide in each lesson in order to enrich their knowledge and understanding of learning. One of the teaching materials developed to increase student understanding in the teaching and learning process is a supplement book based on local potential.

Utilization of plants in forest parks as supporting media for identification can help students identify plant species (Wulandari et al., 2016). The environment is a learning resource that can be utilized, because through the environment it can create contextual learning (Kasim et al., 2018; Nusantari et al., 2020). Biology is a study of living things and various theories that reveal and explain the world of life, the surrounding environment is a laboratory that has an important role and provides a lot of information for human life. Utilizing local resources around where you live can support student learning (Rumalolas et al., 2021). Papua has natural resources that can be utilized for learning resources. Integrating local potential into learning can improve student performance (Damopolii, et al., 2019).

Wonawa District is one of the local communities who inhabit Wooi village in the Kepualauan Yapen Serui Regency. Wooi village is a community that still maintains customs and traditions in the use of natural resource plants, especially plants used as medicinal plants, but the use of medicinal plants is only limited to passing them on from parents to children or grandchildren from generation to generation in the family. Wooi Village uses many plants as ingredients in medicine. So it is necessary to explore and include it in teaching materials for ethnobiology courses. This activity aims to prevent the knowledge of medicinal plants by the local community from becoming extinct. Apart from that, introducing it to students as the general public can maintain this knowledge from generation to generation.

Retrieval of data that needs to be interviewed, namely, informants or resource persons based on age who use medicinal plants in Wooi village. Beliefs about traditional medicine are hereditary and not all people in this sub-district have knowledge of traditional medicine. Information from medical knowledge is only limited to children as their oral descendants. Most of the information about knowledge and methods of traditional medicine will eventually disappear. Therefore, the researchers wanted to dig up information about the people of Wooi Yapen Barat village who so far still practice traditional medicine and the results of this research will be used as a source of learning biology. This research aims to produce a supplement book product of traditional medicinal plants in Wonawa District, Kepualauan Yapen Serui Regency.

METHOD

This research was conducted in Wonawa District, Yapen Serui Islands Regency and at the Department of Biology Education, UNIPA. The current study employs a research and development methodology. The developed product, based on research into the identification of medicinal plant species, is a supplement book. The development of supplementary books only utilizes the A (Analysis),D (Design) and D (Development) stage of the ADDIE model. The research subjects were thirty-five students of Biology Education, three expert sources on traditional medicinal plants, and two experts for supplement book validation.

Medicinal plant data collection was carried out by conducting interviews with three informants. Medicinal plant interview results are documented. The finished supplement book was then validated by two experts. The expert fills in the validation sheet with a score of 1 – 4. Products that have met validity are then tested on students to obtain their responses. Student responses were collected using a questionnaire. Data were analyzed by calculating the scores given by experts and students. The validity criteria are based on the adoption of research by Nunaki et al. (2019) regarding book validation and student response criteria.

RESULTS AND DISCUSSION

Results of interviews with informant

Six queries guided the interview to determine the researcher's location and the demand for the development of supplementary books. The following information was

obtained through interviews with three local informants conducted directly by researchers. The author has collected data through documentation in the form of taking photos directly at the location of the plants growing. Table 1 is the questions posed by the researchers to local informants and Table 2 is the types of medicinal plants.

Table 1. The findings of interviews with informants

No	Question	Asnwer
1	Do you use herbs derived from plants to treat a disease? Yes, it can treat some diseases.	Yes, it can treat some diseases.
2	What types of plants are used? There are several types of plants.	There are several types of plants.
3	These plants are used to treat what disease? Coughs, Allergies, Itches, Ulcers, Cancer, and Fever / Fever Etc.	Coughs, allergies, itches, ulcers, cancer, and fever / fever etc.
4	What parts of these medicinal plants can be used? Parts of Leaves and Stems.	Parts of leaves and stems.
5	How to use ? Boiled with water, in Rahu and pounded.	Boiled with water, in smoked and pounded.
6	Where Are These Plants Obtained? Is it planted, in the forest or in the yard of the house. From Forest and Home yard	From forest and home yard

Table 2. Traditional medicinal plants

No	Local Name	Scientific Name	Utilized Part	Function	Source
1	Hawai	*Carica Papaya L.*	Stems, Leaves	Earache	Yard
2	Sirsak Raun	*Annona muricata*	Leaf	Indigestion	Yard
3	Rema	*Piper betle L.*	Leaf	Allergies / Itching	Yard
4	Andori Kami	*Psidium guajava.L*	Leaf	Diarrhea / Stomach Pain	Yard
5	Blakan Babiji	*Phyllanthus urinaria*	Tree, Root, Leaf	Body aches and pains	Yard
6	Daun Tumbuh Daun	*Kalanchoe pinnata*	Leaf	Fever and headache	Yard
7	Katok Raun	*Sauropus androgynous*	Leaf	Launching breast milk	Yard
8	Jarak Raun	*Ricinus communis*	Leaf	Swollen or Wounded Body Parts, Toothache	Yard
9	Miana Raun	*Coleus scutellarioides L*	Leaf	Boils, Cough	Yard
10	Kombowar	*Morinda citrifolia L*	Leaf	Indigestion and Swollen body parts	Forest
11	Marisan	*Capsicum frutescens*	Leaf	Boils	Yard
12	Mangkokan Raun	*Polyscias scutellaria*	Leaf	Swollen Breasts and Luke	Yard
13	Kamo	*Caladium*	Leaf	Boils	Forest
14	Tumpangan Air	*Peperomia pellucida L. Kunth*	Leaves and Roots	Body aches and pains	Yard
15	Kucai Raun	*Allium tuberosum*	Leaf	Lower the heat	Yard

The results of interviews with lecturers of ethnobiology courses

Before conducting field research, researchers conducted interviews with lecturers of ethnobiology courses. The interviews consisted of nine question items to assess the demand for supplementary books. Table 3 is the findings of interview data with ethnobiology course instructors.

Table 3. Results of interviews with ethnobiology course lecturers

No.	Pertanyaan	Jawaban
1	Are the learning resources that have been used in learning?	From books, internet, and research results
2	Are educational materials helpful for learning activities?	Not all of them are effective
3	Are the limitations of the learning resources used so far?	Local additional information in the Papua area
4	Are students ever invited to conduct direct observations?	Have been in field research.
5	How is the acquisition of student learning outcomes in ethnobiology courses?	Good
6	What challenges do students face when studying ethnobiology?	Understand the calculation and IVI of each growth.
7	Do you have any experience developing ethnobiology course materials based on your own research?	Ever made
8	What instructional materials do students require?	Teaching materials based on local Papuan potential
9	What if you use research-based supplement books to support ethnobiology lectures in class?	Yes, I totally agree if it is local Papuan.

The design stage is designing the product concept. At this stage, choose a format, and do the initial design of teaching materials and assessment instruments. Research-based supplement book for ethnobiology courses to identify types of medicinal plant products by considering students and lecturers. The overall design of the supplementary book consists of: (1) front and back covers, (2) acknowledgments, (3) preface, (4) table of contents, pictures and tables, (5) chapter I introduction to plants - Chapter III Summary, (6) Bibliography, and (7) Glossary.

The Development Stage is the preparation stage for the final product of the supplement book process. This development stage includes identifying research-based supplement books as learning resources and validating supplementary books by two validators. Two experts validated the developed supplement book. The product validator's purpose was to ascertain the veracity of the supplement book. The results assessment results of the first and second validators indicate that the developed supplementary volume can be utilized with a number of modifications. Suggestions for improvement and criticism given by validator one, there are several suggestions for improvement from the supplementary book that can be used, namely in the thank you section page "i" the size and type of the letters are reduced. The lecturer's names are numbered sequentially. Part of chapter 1 Second

paragraph made in Perpoint form, the table of medicinal plant species can be revised, the Classification page is removed from the morphological description table made by the researchers directly in the field from roots, stems, leaves, flowers, fruits, seeds, add lessom plan and maps in the appendix.

Based on the results of the second validator, several suggestions for improving the supplementary book were developed. In the following, several suggestions and criticisms from the validator have been presented, two saying that on the cover, the name of the tribe is added, the logo is lowered to the bottom along with the name of the department, etc. Then use capital letters, changes to writing on page iii of the preface, the glossary is arranged alphabetically.

Table 4. Expert validation results

Validator	Score	Category
Validator 1	79.54	Valid
Validator 2	97.72	Very Valid
Average	88.63	Very Valid

The results of the practical test for supplement books can be determined by analyzing the responses of 35 students to a Likert-scale questionnaire about supplement books. This analysis reveals a positive response from ethnobiology course supplement book users.

Table 5. Student responses

No.	Statement	(%)	Category
1	This supplementary book made it easier for me to learn and influenced me in learning and knowing the morphology of traditional medicinal plants.	87.85%	Excellent
	The language employed is simple, so I am able to comprehend the material's contents	87.85%	Excellent
2	I am able to comprehend the terms contained in the supplementary book because they are illustrated and described.	82.28%	Excellent
3	The font and size of the letters in the supplement book are legible and clear	85.00%	Excellent
4	The illustrations and images in the supplementary book are clear and appealing	88.57%	Excellent
5	There is a glossary, which makes it easy for me to understand scientific words	82.85%	Excellent
6	I am understanding and capable to comprehend how to measure traditional medicinal plants	86.42%	Excellent
7	Because there are illustrations to elucidate the material, I understand more when I read.	92.14%	Excellent
8	Supplementary books according to what students need	88.57%	Excellent
9	This supplementary book can help me in learning about traditional medicinal plants.	90.00%	Excellent
	Average	87.50%	Excellent

Based on the results of the design of the supplement book on the use of medicinal plants measuring 21 cm in length and 14.8 cm in width. It contains pictures of plants and

explanations, starting from the use of parts of plants used in medicine, how to concoct, usage, effects of treatment and classification or scientific names. Based on the use of supplement books in writing description activities, students can understand the general explanation contained in supplement books. Supplementary books help students understand and improve their thinking skills (Zajuli et al., 2020). The general explanation contained in the supplementary book includes the meaning of the description section. Through this understanding process students will have insight and general knowledge about writing descriptions. After understanding the general explanation, students can also understand the steps or how to write a good and correct description. The step or method of writing the description is based on direct observation of an object in the environment around the home page. The surrounding environment is contextual information (Ruto et al., 2021).

The designed supplement book is then validated by experts/validators. Based on the assessment of validators one and two, validity of the supplement book has been determined.. Several revisions were made. Based on the results of validator one's assessment in terms of competency or sub-competency aspects, coherent and complete systematics, language difficulty level, and correct substance discussion, an overall average score of 79.54% is obtained for the "Valid" criterion, with a range of 61% to 80% (Akbar, 2013). In addition, the evaluation of the second validator is reviewed using the same criteria as the first validator. Achieved an aggregate average of 97.72% for the "Very Valid" criterion. Therefore, the supplementary book developed based on evaluating validators one and two is categorized as "Very valid" or "usable."

The results of students' responses to supplement books after students see and read supplement books. The results of student responses obtained that the total average response of 87.5% was included in the excellent category. A major number of these replies indicated that pupils had a favorable reaction when it came to independently comprehend the material presented in the supplement book. This finding indicates that the supplementary book developed is practical. The last activity is optimizing supplementary books according to suggestions and input that have been obtained through validation tests by media and material expert lecturers. In addition, optimization of supplementary books is also carried out according to the responses and input given by students and teachers on the questionnaire sheet that was given during the product trial.

Based on the research that has been done, it can be seen that the supplementary books developed are truly valid and practical for use in learning activities. The developed supplementary book can create a new atmosphere in teaching and learning activities. It can be seen that students look very happy and enthusiastic in using supplement books. Besides that, students also look easier to use and learn with the help of supplement books. This is inseparable from the benefits of using supplement books. One of the benefits of using supplement books in learning activities is to simplify and make learning activities more effective and efficient (Ginting & Harini, 2022; Susanti et al., 2022). Through the use of

supplementary books it can also be used as motivational material in order to increase student interest in learning, so that learning objectives can be achieved optimally.

CONCLUSION

According to the findings of the research, it was determined that the ethnobiology supplement book based on research on traditional medicinal plants in the Wonawa District, Kepualauan Yapen Serui Regency, had very valid criteria for both supplement book validators, with a percentage value of 88.63%. This was the conclusion that was reached as a consequence of the findings of the study. The results of student responses to the supplement book received an average response rate of 87.5% and were categorized as outstanding. As a consequence, the supplement books that were prepared may now be utilized in the learning process of students who are majoring in biology education at UNIPA.

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