Feasibility of The Enrichment Module of Biodiversity Utilization Based on Medicinal Plants Sub-Material

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Article Information	ABSTRAK
	Kemampuan peserta didik dalam proses pembelajaran tentunya berbeda-beda sehingga perolehan nilai juga berbeda. Modul pengayaan digunakan sebagai bahan ajar alternatif bagi siswa yang memiliki kemampuan lebih dan telah mencapai kriteria ketuntasan minimum guna menambah dan memperdalam pengetahuan tentang potensi lokal. Modul pengayaan yang dibuat menyajikan pemanfaatan keanekaragaman hayati, khususnya pemanfaatan tumbuhan obat di Desa Tirta Kencana Kabupaten Bengkayang sehingga peserta didik dapat mengenal jenis tumbuhan obat dan mengetahui manfaat serta cara pengolahannya. Tujuan dari penelitian ini adalah untuk menguji kelayakan modul pengayaan submateri pemanfaatan keanekaragaman hayati. Metode yang digunakan yaitu *Research and Development* (R&D) dengan model Borg and gall. Validasi modul pengayaan dilakukan oleh 5 orang validator di SMA yaitu 2 orang dosen dan 3 orang guru biologi. Analisis data menggunakan rumus lawshe, didapatkan nilai CVI 0,99 sehingga modul pengayaan dinyatakan valid atau layak digunakan sebagai bahan ajar dalam proses pembelajaran pada submateri pemanfaatan keanekaragaman hayati. **Kata kunci:** Kelayakan, Modul Pengayaan, Tumbuhan Obat
Publisher	ABSTRACT
	The abilities of students in the learning process are of course different so that the grades obtained are also different. Enrichment modules are used as alternative teaching materials for students who have more abilities and have achieved minimum completeness criteria in order to increase and deepen knowledge about local potential. The enrichment module created presents the use of biodiversity, especially the use of medicinal plants in Tirta Kencana Village, Bengkayang Regency so that students can get to know the types of medicinal plants and know their benefits and how to process them. The aim of this research is to test the feasibility of the submaterial enrichment module for utilizing biodiversity. The method used is Research and Development (R&D) with the Borg and Gall model. Validation of the enrichment module was carried out by 5 validators at SMA, namely 2 lecturers and 3 biology teachers. Data analysis using the Lawshe formula, obtained a CVI value of 0.99 so that the enrichment module was declared valid or suitable for use as teaching material in the learning process on the sub-material of using biodiversity. ***Keywords:** Feasibility, Enrichment Module, Medicinal Plants*

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INTRODUCTION

Indonesia's biodiversity is very high in the world, so Indonesia is known as a megabiodiversity country (Anggraini, 2018). In addition to having very high biodiversity, Indonesia also has a diversity of tribes or ethnicities that have different and unique traditional and cultural knowledge from Sabang to Merauke (Efremila, et al, 2015). West Kalimantan is one of several provinces in Indonesia that is rich in various types of plants that are useful as medicine (Nurmasari, et al, 2021). One area where the community still uses plants as traditional medicine in West Kalimantan is Tirta Kencana Village, Bengkayang Regency. The processing of plants into medicine in this village is still very simple, based on the experience and religious system obtained from ancestral elders from generation to generation.

Based on the results of interviews with 88 informants in Tirta Kencana Village, Bengkayang Regency, knowledge about medicinal plants is only passed down orally and has not been well documented. This raises concerns that over time this knowledge will be lost. Thus, there needs to be a forum to accommodate information on the use of plants as medicine, so that this knowledge can be learned and recognized by the next young generation through the learning process.

Based on the results of interviews with biology teachers in Bengkayang Regency, namely SMA Negeri 1 Bengkayang, it was obtained that the delivery of biodiversity material was carried out using textbook teaching materials, LKS and power point assistance if needed, and the internet to find additional references. The minimum completion criteria (KKM) for this material is 73. The results of the data obtained from 36 students in the class, there were 90% of students who had achieved the KKM score and 10% of students had not achieved the KKM score. Students who did not complete were given improvements in the form of reworking different questions but with the same cognitive level, while those who completed had not been given follow-up in the form of enrichment due to ineffective teaching materials and time. The sub-material on the utilization of biodiversity listed in the textbook presents examples of the use of plants in general, so that students are less familiar with the potential of plants around them. Thus, teaching materials are needed that can present the utilization of plant potential as enrichment material that aims to enrich the insights of the students themselves, one of which is through an enrichment module.

Enrichment modules are teaching materials that contain enrichment materials, which are intended to broaden and deepen students' knowledge. Enrichment modules are aimed at students who have much faster learning abilities than students in general (Fatmawati & Siti, 2018). Enrichment modules are made with A4 paper size (21 x 29.7 cm) which contain sub-materials on the utilization of biodiversity contained in KD. 3.2 Analyze observation data on various levels of biodiversity (genes, types and ecosystems) in Indonesia and their threats and preservation. In addition, the enrichment module also contains documentation of plants based on the use of medicinal ethnobotany in Tirta Kencana Village, Bengkayang Regency.

This study aims to determine the feasibility of the enrichment module for the sub-material on the utilization of medicinal plant-based biodiversity in Tirta Kencana

Village, Bengkayang Regency. Thus, it is hoped that the enrichment module can help students in Bengkayang Regency and outside Bengkayang Regency in recognizing and understanding the types of plants used as medicine.

METHODS

The method used in this study is Research and Development (R&D) referring to the Borg and Gall model (Sugiyono, 2019). This study uses five of the ten stages of Borg and Gall, namely (1) identifying potential and problems, (2) data collection, (3) product design, (4) design validation and (5) design revision.
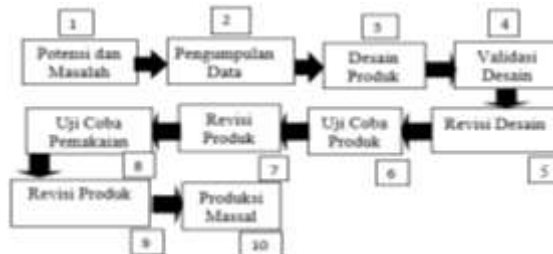

Image 1. *Research and Development* (R&D) Borg and Gall

Identifying the potential and problems in this study, namely, the potential of medicinal plants was obtained in Tirta Kencana Village, Bengkayang Regency, but community knowledge about this was only conveyed verbally from elders or ancestors and had not been well documented so that there needed to be a forum to present the potential of these medicinal plants so that they were known by the outside community and the next younger generation. Therefore, the researcher created an enrichment module as a teaching material, which aims to include the results of interviews regarding the potential of medicinal plants.

Data collection by interviewing 88 informants using triangulation techniques (interviews, observations and documentation). Furthermore, the teaching material validation process was carried out by five validators (examiners), consisting of two lecturers of Biology Education at FKIP Tanjungpura University Pontianak and three Biology teachers at high schools, namely SMAN 1 Bengkayang, SMAS Borneo Bengkayang, and SMA Santo Fransiskus Asisi Pontianak. The validation sheet contains four aspects and eight media assessment criteria referring to the Ministry of National Education (2008), using a Likert scale validation assessment sheet (Sugiyono, 2019). Furthermore, data analysis was carried out based on the aspects and assessment criteria that had been made using the Lawshe formula (1975). The first step is to analyze the CVR value with the following formula.

$$CVR = \frac{ne - \frac{N}{2}}{\frac{N}{2}} \quad \text{(Source: Lawshe, 1975)}$$

Keterangan:

CVR   = *Content Validity Ratio* (Rasio Validasi Konten)
N   = Total panelis validator
Ne   = The number of validator panelists who agree with the validity of the media (considered to agree if the criteria value is between 3 and 4; if the value is less than 3 then it is considered to disagree).

After the CVR value for each criterion is calculated and the results are obtained, the next step is to calculate the CVI (Content Validity Index) value to show that the instrument as a whole has good content validation. The CVI value is calculated using the following formula:

$$\text{CVI} = \frac{\Sigma\,\text{CVR}}{\Sigma\text{n}} \quad \text{(Lawshe, 1975).}$$

Note:

N = Number of items in each aspect with a rating of agree or strongly agree (score 3 or 4):

If the CVI validation value of 0.99 is in accordance with the minimum limit value, the enrichment module can be considered good and suitable for use (Lawshe, 1975). The CVR and CVI index values are set to 0.99 if the CVR value = 1. This value is adjusted to the number of validators used in this study, which is five.

RESULT AND DISCUSSION

The creation of a biodiversity sub-material enrichment module based on medicinal plants in Tirta Kencana Village, Bengkayang Regency was designed using the Canva.com application with A4 paper size (21 cm x 29.7 cm), and printed using 230 gsm art cartoon for the cover and 150 gsm art paper for the content. The enrichment module contains 56 pages, double-sided display, full color, with a bluish gray and green base color.

The components of the enrichment module in this study are modifications that refer to (Prastowo, 2016), namely there is a front cover that displays the module title, subtitle and picture of plants, equipped with the university logo, university name, year and author's name. The back cover provides a brief overview of the contents of the enrichment module, foreword, table of contents, concept map, introduction, brief description of the sub-material on the utilization of biodiversity (there is an understanding of biodiversity, the utilization of biodiversity in general which includes supporting images and knowledge information), a brief description of Tirta Kencana Village, research results on the use of plants as medicine in Tirta Kencana Village, summary, independent activities, evaluation, bibliography, glossary, and answer key. The appearance or components of the enrichment module can be seen in Figure 2.
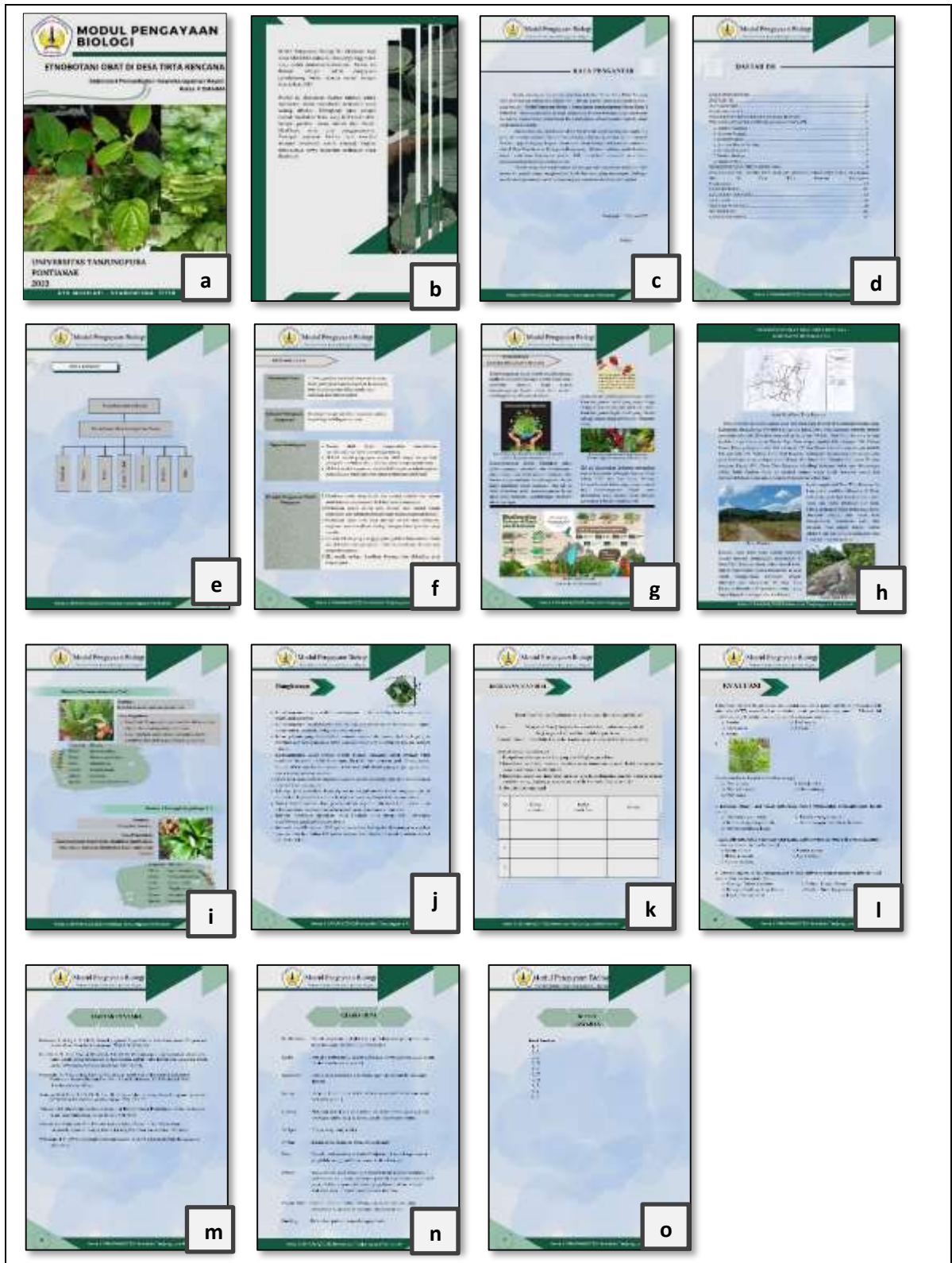
Figure 2. Enrichment Module Display: a. Front cover, b. Back cover, c. Foreword, d. Table of contents, e. Concept map, f. Introduction, g. Brief description of sub-material on utilization of biodiversity, h. Brief description of Tirta Kencana Village, i. Results of research on utilization of medicinal plants in Tirta Kencana Village, j. Summary, k. Independent activities, l. Evaluation, m. Bibliography, n. Glossary, o. Answer key

The enrichment module was validated by five validators based on four aspects and eight assessment criteria, as well as analysis of the feasibility test data for the

biodiversity sub-material enrichment module using the formula (Lawshe, 1975) to obtain the CVR and CVI values as shown in Table 1.

Table 1. Analysis of Validation Results of Enrichment Module Teaching Materials

Aspect	Criteria	Validator					CVR	Description
		1	2	3	4	5		
Content	1. Compliance of KD, indicators, learning objectives with the content of the sub-material on the use of biodiversity	4	4	4	3	4	0,99	Valid
	2. Suitability of species examples and images with sub-material on the use of biodiversity	4	3	3	4	3	0,99	Valid
	3. The suitability of the research results presented with the sub-material on the use of biodiversity	4	3	3	4	4	0,99	Valid
	4. The module is self-instructional (allows students to learn independently)	4	4	4	4	4	0,99	Valid
Language	5. Sentences are arranged communicatively so that the information is easy to understand.	3	3	4	4	4	0,99	Valid
Display	6. The display design is attractive for learning and is suitable for both independent and group use.	4	3	4	4	4	0,99	Valid
	7. Appropriateness of colors, images, writing and font size in the enrichment module	3	3	4	4	4	0,99	Valid
Effectiveness	8. Practicality and durability of enrichment modules	3	4	4	4	4	0,99	Valid
	CVI						0,99	Valid

Description: CVR = Content Validity Ratio, CVI = Content Validity Index

The enrichment module includes a brief description of the sub-material on the utilization of biodiversity with communicative language and a special discussion on plants used as medicine by the community in Tirta Kencana Village. This discussion is equipped with pictures, species names, classifications, benefits, and methods of processing medicinal plants. The feasibility test of the medicinal plant enrichment module was measured through 4 aspects consisting of 8 criteria, a CVR value of 0.99 was obtained for each criterion, and a total CVI value of 0.99, so it is said to be valid and suitable for use in the learning process. The 4 aspects can be described as follows.

a. Content

Consisting of four criteria, the first is the suitability of KD, indicators, learning objectives with the content of the biodiversity utilization sub-material, obtaining a CVR value of 0.99 so that it is considered valid. These results indicate that the enrichment module that has been prepared is in accordance with the basic competencies, competency achievement indicators and learning objectives to be achieved. Ghiyaats (2019) stated that BSNP considers

learning media good if the content is in accordance with learning objectives, basic competencies, and syllabus.

The second criterion is the suitability of the species examples and images with the sub-material of biodiversity utilization, the CVR value obtained is 0.99 so it is said to be valid. This result shows that the species examples and images used in the enrichment module are in accordance with the sub-material of biodiversity utilization so that they can clarify the discussion of the sub-material. Arsyad (2014) teaching materials or media use images to show the ideas of the material presented, so as to clarify the intent and purpose of the discussion/discussion in the media.

The third criterion, the suitability of the research results presented with the sub-material on the utilization of biodiversity, obtained a CVR result of 0.99 so that it is considered valid. This shows that the results of the ethnobotany research on medicinal plants in Tirta Kencana Village, Bengkayang Regency presented in the enrichment module are in accordance with the sub-material on the utilization of biodiversity, by including images, species names, classifications, benefits, and how to process them.

The fourth criterion is that the module is self-instructional (allows students to learn independently), the CVR result is 0.99 so it is declared valid. In the enrichment module which is made using simple language (communicative), there are instructions in using the enrichment module, and it is equipped with evaluation questions. According to Daryanto (2013) a module is a teaching material that functions as a tool or means of independent learning, which allows students to learn at their own pace and ability.

b. Language

Sentences that are arranged communicatively so that information is easy to understand, get a CVR result of 0.99 which means valid. The enrichment module that was created already uses communicative and simple sentences for information that is easier to understand and avoids sentences with multiple meanings so that there are no misinterpretations. According to Aryursmar (2011) Media must use short, simple, interesting, concise, straightforward, and clear language.
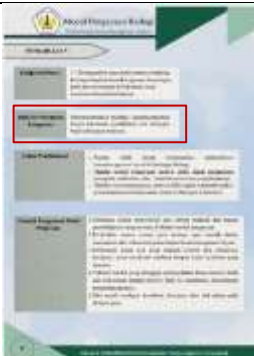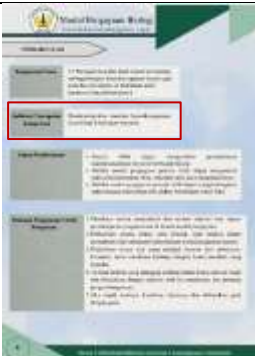
c. Display

There are two criteria in the presentation aspect, the first is the display design that attracts interest in learning and is suitable for both independent and group learning, obtaining a CVR result of 0.99 which means it is valid. The enrichment module is designed in an interesting way to motivate students' interest in learning independently and in groups. The enrichment module is made with a brief, concise and clear description of the material, the color of the module is full color, equipped with pictures and includes local potential (medicinal ethnobotany in Tirta Kencana Village, Bengkayang Regency) so that it is interesting and not boring. According to Rahmawati (2013) Students usually like interesting reading with little explanation but with lots of pictures and colors.

The second criterion, the suitability of color, image, writing and font size in the enrichment module, obtained a CVR result of 0.99 so that it was declared valid. The enrichment module was made in full color with a grayish blue background combined with dark green and light green, the dominant writing color was black so that it did not cause visual difficulties for the reader. This is in line with Purnama (2010) Color can arouse feelings, attention, and interest because it is very close to a person's vision and sensitivity.

d. Effectiveness

In this study, the aspect of effectiveness is meant by the practicality and durability of the enrichment module, with a CVR result of 0.99 which means it is valid. The enrichment module is A4 in size (21 x 29.7 cm), like books in general so that it is easy to carry anywhere. The enrichment module is made using 230 gsm art carton on the cover and the contents use 150 gsm art paper, so that it provides clear print results and does not fade easily. In addition, the type of paper that is slightly thick also increases the durability of the enrichment module so that it is not easily torn, so it can be used for a long time. According to Diko (2015) art paper is a type of paper that has a couted nature, is resistant to moisture, is difficult to absorb dirt, and provides sharper print colors.

Table 2. Validator Comments and Suggestions

Table 2. Validator Comments and Suggestions	Revison	
	Before	**After**
Improve the GPA and Content of the Material to be more appropriate2q		
There are images that are not explained in the text, page 6.		

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Display for monotonous research results	
Some images are blurry (as on page 7), The image on page 7 (ethnic diversity) does not match the sub-material, it is better not to include it	
Misspelling of nutmeg species name, page 4.	

The enrichment module that has been validated and analyzed data, then revised or improved parts that are still lacking based on comments or suggestions given by the validator as shown in table 2. The purpose of the design revision is to perfect the enrichment module, to achieve a final module design that is in accordance with the agreed intent and purpose.

SUMMARY

The enrichment module on the biodiversity utilization sub-material using 4 aspects consisting of 8 assessment criteria obtained an average validation value of CVR and CVI of 0.99 (valid), it can be concluded that the enrichment module is suitable for use. To find out how effective the enrichment module teaching materials that have been validated are as learning media on the biodiversity utilization sub-material in class X of high school, a trial is needed.

ANKNOWLEDMENT

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REFERENCES

Anggraini, W. (2018). Keanekaragaman Hayati Dalam Menunjang Perekonomian Masyarakat Kabupaten Oku Timur. *Jurnal Aktual STIE Trisna Negara*, 16(2), 99-106.

Arsyad, A. (2014). *Media pembelajaran*. Jakarta: Raja Grafindo Permai.

Aryusmar. (2011). Karakteristik Bahasa Jurnalistik Dan Penerapannya Pada Media Cetak. *Jurnal Humaniora*, 2 (2), 1209-1218.

Daryanto, (2013). *Inovasi Pembelajaran Efektif. Bandung*: Yrma Widya.

Depdiknas. 2008. *Panduan pengembangan bahan ajar*. Jakarta: Depdiknas

Diko, M. (2015). *Ragam Jenis Kertas*. http://www.gramediaprinting.com/.

Eefremila, Evy, W., & Lolyta, S. (2015). Studi Etnobotani Tumbuhan Obat Oleh Etnis Suku Dayak Di Desa Kayu Tanam Kecamatan Mandor Kabupaten Landak. *Jurnal Hutan Lestari,* 3(2), 234-246.

Fatmawati, E., & Siti, N. H. (2018). Penerapan modul pengayaan berstrategi PQ4R untuk meningkatkan hasil belajar siswa. *E-Journal Pensa*, 6(2), 208-212.

Ghiyaats, A. (2019). *Analisis Kelayakan Isi Buku Petunjuk Praktikum Anatomi Blok 1.3 Terhadap Mahasiswa Kedokteran FK UNS Angkatan 2018*. Diakses dari https://osf.io/gt2yk/download/?format=pdf

Lawshe, C. H. (1975). A Quantitive Approach to Content Validity. *Personnel Psychology*. 28(4), 563-575.

Nurmasari, Syamswisna, & Andi, B. T. (2021). Kelayakan Ensiklopedia Pada Submateri Pemanfaatan Keanekaragaman Hayati Dari Hasil Etnobotani Tumbuhan Obat. *Didaktika Biologi: Jurnal Penelitian Pendidikan Biologi*, 5(2), 85-92.

Prastowo, A. (2011). *Panduan Kreatif Membuat Bahan Ajar Inovatif; Menciptakan Metode Pembelajaran Yang Menarik Dan Menyenangkan*. Jogjakarta: Diva Press

Purnama, S. (2010). Elemen warna dalam pengembangan multimedia pembelajaran agama Islam. *Jurnal AI-Bidayah*, 2(1), 113-129.

Rahmawati, L.N., Sudarmin, Pukan, K.K. (2013). Pengembangan Buku Saku IPA Terpadu Bilingual Dengan Tema Bahan Kimia Dalam Kehidupan Sebagai Bahan Ajar di Mts. *Unnes Science Educational Journal*, 2(1), 157-164.

Sugiyono. (2019). *Metode penelitian pendidikan*. Bandung: Alfabeta.