

DEVELOPMENT OF AN ENCYCLOPEDIA OF ANGIOSPERMS FOUND IN THE SCHOOL ENVIRONMENT AS A SOURCE FOR LEARNING MATERIALS PLANTAE OF CLASS X STUDENTS OF SMAN 4 SUNGAI RAYA

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ABSTRACT

Effective, interesting and enjoyable learning requires tools to support successful learning which are interrelated, namely teaching, learning activities and learning resources. Learning resources are a very important factor to support success in the learning process. The aim of this research is to determine the validity, practicality and effectiveness of the angiosperm encyclopedia found in the school environment as a source of learning plant material for class X students at SMAN 4 Sungai Raya. The research method used was Research and Development (R&D) with the 1974 Thiagarajan 4D research design (Define, Design, Develop and Disseminate). The data collection techniques used are measurement techniques and indirect communication techniques, instruments used include validation sheets, response questionnaires, and pretest posttest questions. The sample in the research used a Purposive Sampling technique, namely with a class X B population. The data analysis technique used was a test of validity, practicality and effectiveness. The validity results in this study were 88.38%, practicality 96.02%, the effectiveness obtained was an N-Gain value of 0.69 in the medium category.

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Introduction

Technology and knowledge that are always evolving require schools to understand and develop the learning components of a particular subject. Because teachers are very important in the learning process, they are encouraged to be more creative and innovative when using media as a learning aid. In the learning process, it is necessary to use tools to measure learning outcomes that are closely related, such as learning activities, learning, and learning source (Samsinar, 2019).

Effective, interesting, and engaging instruction can be aided by the teacher as a facilitator to make the instruction more varied throughout the entire process. Due to the availability of media and learning resources, the instructor can provide a motivating and inspiring learning environment for the students during the learning process. Gurus should also be able to use a variety of learning resources for students' benefit during the teaching process,

including creative, innovative, and tepat sasaran resources that meet students' needs while utilising appropriate technology (Sulistyo & Nafisah, 2019).

Learning resources is a very important factor in determining the success of the learning process, but low sumber belajar makes it difficult for students to understand the material. Learning esources refers to any material that students can use, such as data, images, characters, the environment, and so on, to help them reach their learning objectives and capabilities. 2019:138; Akhiruddin et al.

The purpose of education can be achieved by using media as a component in the learning process so that students can understand the material more easily (Sinaga & Rakhmawati, 2022). Biology education that is closely related to everyday life can use the environment around the school as a learning resource, including utilising local resources that are available in the area. As of right now, students are having difficulty understanding biological concepts because they are only able to summarise and explain theories without connecting the material that has already been taught to their daily lives. Using the various potentials that are present in the surrounding environment can help students understand not only theoretical concepts but also local potential, making the environment around the school more useful and instructive (Hamidah & Ratnasari, 2020).

local wisdom can be incorporated into a curriculum-based learning programme since it provides a significant advantage in evaluating local knowledge. The existence of the natural environment is a potential that can be used to enhance student activities during the learning process. However, nearby keberadaan alam is not being used to its full potential. This is in accordance with (Santika, 2022). According to the results of the study conducted with the biology teacher at SMAN 4 Sungai Raya, there is a problem, which is that the teaching media only uses the book package as a guide during the teaching process. The effects of this type of educational media can affect students' motivation and interest in learning, making them more engaged in the process; students also struggle to understand the material in the best possible way; students are more attracted to visual learning media that have characteristics that make learning more enjoyable, such as pictures and colorful learning resources. Next problem is that schoolchildren are more attentive to the learning process in the classroom and have already begun practicing due to the keterbatasan of the equipment in the laboratory, so many students are more attentive during the learning process in the classroom.

According to the survey results, 90.9% of the students in grade X at SMAN 4 Sungai Raya reported experiencing difficulties when learning biology, 51.5% reported experiencing difficulties when learning plant-based submaterials, 100% of the students expressed satisfaction with the learning materials that were engaging, with few written, illustrated and colored, and 100% expressed greater satisfaction with the learning materials across the board. Therefore, educational materials that are needed and can be used to increase students' interest in studying Angiospermae are called Ensiklopedia.

.The use of educational media can benefit students and make it easier for them to identify the identified species. This can be explained by ensiklopedia media based on local potential, as these media can depict local bunga that is frequently seen by students in the surrounding area and contrasted with materials that support the aforementioned object's behaviour. Ensiklopedia also provides all the information together with illustrations or pictures that correspond to the topics discussed. With the aforementioned problems about the minimum amount of learning resources available at SMAN 4 Sungai Raya and the potential of local hutan in the school environment, it has never been used as a learning resource.

The local potential of the exploratory learning process is to analyse, develop, teach, and increase student participation in the biological education process. In the classroom at

SMAN 4 Sungai Raya, learning via the exploration of plant that exists outside of the classroom can create new ideas. In order to analyse and categorise the various species found in the surrounding area of the school, researchers conducted a field observation around SMAN 4 Sungai Raya with the help of the Plannet application to identify the species that were discovered by the researchers. Through exploration, the researchers were able to determine the species' alami habitat and the condition of the live habitat.

The title of the study, " Development Ensiklopedia Angiospermae What is Found in the School Environment as a Learning Resource for Plantae Material for Class X Students of SMAN 4 Sungai Raya," serves as a motivator for the researcher.

Method

The research being conducted uses a 4D model, which is composed of the following terms: Define (Pendefinisian), Design (Perancangan), Develop (Pengembangan), and Disseminate (Penyebarluasan). The subject of this study's development is the tim ahli validator, which is composed of five validators: one media person and one media person who is a graduate of the Pendidikan Biologi programme and a teacher at SMAN 4 Sungai Raya. Three people make up the ahli material, which consists of two students from the biology programme and one teacher from SMAN 4 Sungai Raya. In contrast, the subject of this study's uji coba soal uses a small group of students, specifically XI IPA, which consists of 31 students from SMAN 4 Sungai Raya. The techniques used in this study include silent and non-verbal communication, measurements, and documentation, Instruments used in this study include student questionnaire response, ahli validation, and tests, which are composed of pretest and posttest questions.

The primary challenge in this study is the validity, practicality, and effectiveness of the development of angiospermae that are used in school environments as learning resources. Siswa Kelas X SMAN 4 Sungai Raya Materi Plantae.

Ensiklopedia Angiospermae That Is Used in School Environments as a Sumber of Learning is validated by validators using both quantitative and qualitative data. The aforementioned qualitative data may serve as a review and validation example from the ahli or validator. The following is a hypothesis to support the presentation of Ensiklopedia's validity in this study:

$$\text{The Persentase Index \%} = \frac{\text{The sum of the scores obtained}}{\text{highest score (number)}} \times 100\%$$

It is possible to examine the practical requirements of the Ensiklopedia Angiospermae that are used in the school environment as a basis for teaching plant science to Siswa Kelas X SMAN 4 Sungai Raya in Table 1.

Table 1. Product Validity Analysis

Percentage %	Validity Criteria
81 - 100%	Very Valid
61 - 80%	Valid
41 - 60%	Fairly Valid
21 - 40%	Less Valid
4 - 20%	Invalid

(Septiani et al, 2023)

The Encyclopedia of Angiosperms Found in the School Environment as a Learning Resource for Plantae Material for Class

The effectiveness of the Encyclopedia of Angiosperms Found in the School Environment as a Learning Resource for Plantae Material for Class The formula for calculating the percentage of module effectiveness in this research is as follows:

$$N\text{-gain}(g) = \frac{S_{post} - S_{pre}}{S_{maks} - S_{pre}}$$

Information:

N-gain(g) = Normalized

Spota = Skor *Post Test* (Dalam rata-

rata) Smaks = Skor maksimum

Spre = Skor *Pre Test* (Dalam rata-rata)

So, to see the effectiveness criteria of the Encyclopedia of Angiosperms Found in the School Environment as a Learning Resource for Plantae Material for Class X Students of SMAN 4 Sungai Raya 2.

Table 2. Grouping of N-gain(g)

Big N-gain(g)	Clarification
$g > 0,7$	Tall
$0,3 \leq g \leq 0,7$	Currently
$g < 0,3$	Low

(Hake, 1998)

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Results And Discussion

Results of Encyclopedia Development

Development of an Encyclopedia of Angiosperms Found in the School Environment. This Angiosperm Encyclopedia consists of title, identity, foreword, table of contents, research location, table of contents, list of images, list of species, list of tables, exploration table, Cp, Atp and learning objectives, instructions for use, concept map, angiosperm plants found in the environment around the school, glossary, bibliography index. The contents of the Encyclopedia consist of material on angiosperm plants, results of field observations and identification of angiosperm plants which consist of descriptions, habitats, benefits, regarding identified angiosperm plants, classification, picture descriptions and local names of angiosperm plants. The closing consists of a glossary, index, and description of SMAN 4 Sungai Raya. Kevalidan Ensiklopedia

The validity of the Encyclopedia in this research uses the results of the material expert validation sheet and the results of the expert validation sheet. The following are the results of the material expert validation analysis.

Table 3. Average Assessment of Material Experts

No	Validator	Name Validator	Percentage %	Criteria
1.	Validator I	Tesa Manisa, M.Pd	83,71%	Very Valid
2.	Validator II	Herditya, M. Pd	78,72%	Valid
3.	Validator III	Prameswara Wahyu Jati, S. Pd	91,32%	Very Valid
		Rata-rata	84,58%	Very Valid

From the validation results of the material obtained, an average score from material experts was obtained of 84.58% with Very Valid criteria. The Encyclopedia of Angiosperms Found in the School Environment as a Learning Resource for Plantae Material for Class X Students of SMAN 4 Sungai Raya is very valid to be used as a learning medium. The results of the media expert validation analysis are as follows.

Table 4. Average Rating of Media Experts

No	Validator	Name Validator	Percentage %	Criteria
1.	Validator I	Nawawi, S.PD S., M.Pd	91,11%	VeryValid
2.	Validator II	Puput, S. Pd	93,33%	Very Valid
		Rata-rata	92,22%	Very Valid

From the media validation results obtained, it was obtained average value from media experts amounting to 92.22% with very valid criteria. So the Encyclopedia of Angiosperms Found in the School Environment as a Learning Resource for Plantae Material for Class X Students of SMAN 4 Sungai Raya is categorized as very valid so that it can be used as a learning medium that is ready to be tested on students.

So the level of validity of the assessment results of the validator expert team, namely material experts and media experts, is regarding the Encyclopedia of Angiosperms Found in the School Environment as a Learning Resource for Plantae Material for Class X Students of SMAN 4 Sungai Raya.

Table 5. Recapitulation of Results from Material Experts and Media Experts

No	Validator	Percentage %	Criteri
1.	material expert	84,54%	Very Valid
2.	Media Expert	92,22%	Very Valid
	Average	88,38%	Very Valid

Based on the table above, we summarize the assessments of material experts and media experts amounting to 88.38% with very valid criteria so that the Encyclopedia of Angiosperms Found in the School Environment as a Learning Resource for Plantae Material for Class X Students of SMAN 4 Sungai Raya can be used in the school where the research was carried out. The results obtained are in line with Della Aulia Pangesti (2023) entitled "Development of an Encyclopedia of Angiosperm Plants Based on Local Potential as a Learning Resource for Class X High School Students with very good criteria. The Angiosperm Encyclopedia Found in the School Environment as a Learning Resource for Plantae Material for Class with learning media in the form of an Encyclopedia that was developed. This is also reinforced by previous research conducted by 1. Atirah, et al in

(2019) "Development of an Encyclopedia of Medicinal Plants Based on Local Potential in the Sinjai Region as a Learning Resource for Plantae (Spermatophyta) Material with validity results of 83.7% with very valid criteria as well as research (Nurul Fatimah 2019) Development of an Encyclopedia of Ornamental Plants in Pasty (Yogyakarta Animal and Ornamental Plant Market) on Biodiversity Main Material for Class X SMA/MA Students with validity results of 83.98% with medium criteria.

The effectiveness of the Encyclopedia in this research uses posttest results. The following are the results of the analysis of the effectiveness of the module in terms of student posttest results, which can be seen in table 6

Table 6. Hasil N-gain

Information	Pretest	Posttest	Average value (Mean)		Average N-gain	Information
			Pretest	Posttest		
			Number of students	31		
The highest score		70	100			

Based on the results obtained from the students' pretest and posttest questions in table 6 above, the N-gain was obtained at 0.69 with moderate information, so it can be said to be effective. This is supported by Della Aulia Pangesti's research (2023) entitled "Development of an Encyclopedia of Angiosperm Plants Based on Local Potential as a Learning Resource for Class X High School Students with an average student result of 85.2% with very good criteria.

Meanwhile, according to Fiki Zada Ribhi Assani in (2018) "Development of a Spermatophyte Encyclopedia Based on Local Potential at the Sunan Kalijaga Tomb and Demak Grand Mosque as a Learning Resource for Plantae Material for Class X SMA/MA with effectiveness results of 86.25% with very effective criteria.

Research (Reni Julianti (2021) with the title "Development of an Encyclopedia of Medicinal Plants for the Kerinci Community as a Learning Resource for Biodiversity Materials for High School Students. The results of trials on teachers obtained a large scale score with a score of 96.44%

Conclusion

Based on the results obtained from research conducted regarding the Encyclopedia of Angiosperms Found in the School Environment as a Learning Resource for Plantae Material for Class X Students of SMAN 4 Sungai Raya, it was declared very valid and effective so that it can be used in learning. So it can be concluded that:

1. Validity of the Encyclopedia Encyclopedia of Angiosperms Found in the School Environment as a Learning Resource for Plantae Material for Class X Students of SMAN 4 Sungai Raya. The results obtained were 88.38%, so it can be said to be very valid.
2. Practicality of the Encyclopedia Encyclopedia of Angiosperms Found in the School Environment as a Learning Resource for Plantae Material for Class
3. he effectiveness of the Encyclopedia Encyclopedia of Angiosperms Found in the School Environment as a Learning Resource for Plantae Material for Class

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