

# **Development of an Encyclopedia of Closed Seed Plants (Angiosperms) in the Madrasah Technonatura Yogyakarta Area As a Science Learning Resource for MI and MTS Students**

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**Abstract:** Development of an Encyclopedia of Closed Seed Plants. The high diversity of plant species at Madrasah Technonatura Yogyakarta is a local potential that can be utilized as a learning resource in the science learning process. This research aims to determine the diversity of types of closed seed plants in the Madrasah Technonatura Yogyakarta area and develop an encyclopedia of several types of closed seed plants and determine the quality of the products developed. This research is a type of R & D (Research and Development) research. This research uses an exploratory method. Development research method with the ADDIE model (analysis, design, development, implementation, evaluation). The final result of the research is printed media in the form of an encyclopedia of closed seed plants. Products are assessed using an assessment instrument in the form of a checklist questionnaire sheet. The product was assessed by 1 material expert, 1 media expert, 3 peer reviewers, 1 science teacher, and 10 responses from MTS Technonatura level 7 students and 7 MI Technonatura level 3 students. The data obtained was then analyzed descriptively qualitatively and quantitatively. The results of research on the encyclopedia of closed seed plants by material experts received a percentage of 90% in the very good category, media experts 95% in the very good category, peer reviewers 96% in the very good category, science teachers 95% in the very good category, and students 95% in the very good category. Thus, it can be concluded that the encyclopedia of closed seed plants that has been developed is suitable for use as a science learning resource for MI and MTS students. (Angiosperms) in the Madrasah Technonatura Yogyakarta Area As a Science Learning Resource for MI and MTS Students.

**Keywords:** Encyclopedia, Madrasah Technonatura, Science learning resources.

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## **Introduction**

Indonesia has an area of 9 million km<sup>2</sup> (2 million km<sup>2</sup> of land, and 7 million km<sup>2</sup> of ocean) has a very high plant diversity. Indonesia has 25% of the world's flowering plant species, ranking seventh with a total of 20,000 species, and 40% of these species are endemic to Indonesia (Whitemore 1985 in Kusmana 2015). The most commonly found and utilized seed plant commodities are closed seed plants (angiosperms). Closed seed plants are autotrophic organisms that use double mating

through flowers and fruits which is one of the causes of this evolutionary success (Nugroho et al., 2012).

Technonatura Jogja International Madrasah is one of the formal educational institutions registered with the Ministry of Religious Affairs of the Republic of Indonesia under the auspices of CREATE, this madrasah is located in Pakem, Kalasan, Sleman which has a room with an open concept and close to nature. Around the madrasah, there are many types of plants that are interesting to study, one of which is closed seed plants.

Identification of inventory, and classification is one of the efforts that can be done by researchers to determine the level of diversity of flowering plants in order to be developed as a science learning resource in the form of an encyclopedia. The results of this study can be used as a madrasah archive and as a learning resource for students at the MI and MTS levels to recognize angiospermae plants.

## Materials and Methods

### A. Study area

The research was conducted in the area of Technonatura International Madrasah Jogjakarta since August-November 2024.

### B. Sampling

Picture taking was done using an Infinix note 30 cellphone camera. the research began with the determination of observation points, followed by exploration to each observation point. exploration was carried out by taking photos of angiospermae plants and then the identification process was carried out. photos of plants taken must be clear to facilitate the identification process. identification, inventory, classification of the identification process was carried out with the help of several references. the most widely used references are flora books (steenis, 2006), flora encyclopedias (lipi writing team, 2009), and several websites on the internet such as natureloveyou. sg, plantsystematics.org, inaturalist.org, plan-net.com, and other websites. the results of the identification process are validated by experts. the inventory process is carried out by recording all plant species that exist at each observation point. this data collection results in the number of species at each observation point and the number of angiospermae plant species in the International Madrasah Technonatura Jogjakarta. the classification process is carried out by grouping the benefits of angiospermae plant species of the International Madrasah Technonatura Jogjakarta.

### C. Research Procedure

This research uses development research (Research and Development). Development research (R&D) is a research method used to produce certain

products, and test the effectiveness of these products (Sugiyono, 2015: 297). This research uses the ADDIE model which is limited to the Analyze, Design, Development and Evaluation (ADDE) stages only. However, this research is without the implementation stage due to time and cost constraints. This product assessment will be carried out by material experts, media experts, ipa teachers and limited testing by 7 MI students and 10 MTS students.

## Results and Discussion

The results of this study are in the form of Angiospermae Encyclopedia products. This encyclopedia is used as a supporting book for MI and MTs students as a science learning resource. The research took small-scale and large-scale subjects using MI and MTS class students because these students had taken the Classification of Living Things material on the subject of Kingdom Plantae Angiospermae Subdivision in class VII. This research uses the ADDIE model which is limited to the Analyze, Design, Development and Evaluation (ADDE) stages only. However, this research is without the implementation stage. In the preparation of making this encyclopedia, it received an assessment from several material experts, media experts, science teachers and students.

### 1. Material expert

This angiosperm plant encyclopedia product was assessed by material experts. The material expert assessment sheet consists of 3 aspects with 24 assessment indicators. The assessment of the e-module content is based on the aspects of completeness of content/material, presentation and language. The material presented is sourced from various references, such as books, scientific journals and articles so that the material presented becomes more complete. In the presentation aspect, the assessment is based on the consistency of the presentation systematics, the selection of images, the generation of student learning motivation at the beginning of the material, student involvement and the completeness of the presentation. While in the linguistic aspect, the assessment criteria are

seen from the suitability of language with Indonesian language rules, the readability of the encyclopedia and the ability to elicit student responses to the material as well as the suitability of the use of symbols / symbols and scientific names. The language in the encyclopedia is made interesting, easy to understand and does not cause multiple interpretations, this is done to fulfill the characteristics of self instructional teaching materials, namely by using simple and communicative language (Sukiman, 2012: 133). The assessment was carried out by filling out a questionnaire instrument sheet in the form of a google form by providing a check list and suggestions and input. The assessment given by the material expert, as a whole, shows that the encyclopedia has very good quality with an ideal percentage of 90%.

## 2. Media expert

Media experts gave an overall assessment on each aspect with a very good category. The media expert assessment sheet consists of 2 aspects with 15 assessment indicators. The assessment of the encyclopedia content is based on the presentation and linguistic aspects. In the presentation aspect, the assessment is based on the quality of the interface which is assessed from the selection of images, colors, fonts and font sizes as well as clear display design and does not reduce student focus. assessed from the use of language in accordance with Indonesian language rules and student development, readability, ability to motivate students to respond to the material presented and finally the use of terms, symbols and symbols. The assessment was carried out by filling out a questionnaire instrument sheet in the form of a google form by providing a check list and suggestions and input, Based on the assessment given by the media expert, it shows that the encyclopedia has very good quality with an ideal percentage of 95%.

## 3. Science teacher

The results of the assessment by 2 science teachers at the International Madrasah Technonatura Jogjakarta overall received a very good category in each aspect. The science teacher assessment sheet consists of 4 aspects with 27 assessment indicators. The assessment is based on aspects of content/material feasibility, which is presented at

the beginning of the material sub chapter, presentation and the last aspect of language. The assessment was carried out using a questionnaire instrument sheet in the form of a google form, based on the results of the assessment given by the science teacher, showing that the encyclopedias have very good quality with an ideal percentage of 95%.

## 4. Student Response

The results of the readability test to 17 students of grade 3 MI and 7 International Madrasah Technonatura Jogjakarta received a response of "Strongly Agree" meaning that this encyclopedia product received a very good assessment from students. In line with Riduwan's statement (2013), students feel interested and motivated to study harder with the teaching resources in the form of encyclopedias that have been provided. This can help students in obtaining new learning resources. With this encyclopedia teaching material, it can also support learner-centered learning, so that students must be required to gather information as a source of learning. Based on the results of student responses to the angiospermae plant encyclopedia, it shows that the encyclopedia has very good quality with an idealized percentage of 95%.

## Conclusions

Conclusion Based on the research that has been done, several conclusions are obtained conclusions as follows:

1. The angiospermae plant encyclopedia product was successfully developed using the Canva design application.
2. This research uses the ADDIE model which is limited to the Analyze, Design, Development and Evaluation (ADDE) stages only. However, this research is without the implementation stage.
3. The quality of the angiospermae plant encyclopedia developed based on the assessment of the material expert obtained a very good category (sb) with an ideal percentage of 90%, media experts 95% with a very good category, science teachers 95% with a very good category, and students 95% with a very good category.

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