



## Development of Herbarium-Based Learning Media for the Classification of Living Organisms in Grade VII at Pondok Pesantren Darunnadwah

Riska Nabila\*

Universitas Islam Negeri Mataram

**Corresponding Author:** Riska Nabila [riskanabila63@gmail.com](mailto:riskanabila63@gmail.com)

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### ABSTRACT

The use of instructional media in teaching Natural Sciences has a significant impact on student engagement, concept comprehension, motivation, and learning outcomes. This research aims to develop herbarium-based instructional media that can support the learning of classifying living organisms for seventh-grade students at Pondok Pesantren Darunnadwah. The research method employed is Research & Development (R&D) using the ADDIE model, which encompasses three main stages: Analysis, Design, and Development. The validation results by the IPA teacher indicate a score of 80% (very worthy), and based on student responses during the trial of the herbarium media, an average score of 89.5% (very worthy) was obtained. Based on these assessments, it can be concluded that the Herbarium media does not require further revision.

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## **INTRODUCTION**

Pondok Pesantren Darunnadwah is an educational institution located in the village of Gapuk, Gerung Subdistrict, West Lombok Regency. Education at this Islamic boarding school aims not only to provide a strong understanding of Islamic values but also to cultivate a deep understanding of general knowledge, including Natural Sciences (Sabil & Diantoro, 2021). This combination assists students in comprehending and connecting relevant aspects of religion and science to their daily lives.

Natural Science (IPA) plays a crucial role in shaping students' scientific understanding and skills (Hendri & M, 2019). Natural Science helps students comprehend the natural world, explain natural phenomena, and develop analytical thinking abilities (Budiarso et al., 2020). Understanding scientific concepts also provides a strong foundation for problem-solving in daily life. (Karisma et al., 2023). Therefore, effective Natural Science (IPA) learning is highly important in supporting the development of students at Pondok Pesantren Darunnadwah.

One of the topics or subjects in Natural Science (IPA) learning at the seventh-grade level is the classification of living organisms. The concept of classifying living organisms teaches students to understand the diversity of living things and the fundamentals of biology. Through classification, students can grasp the process of grouping living organisms into smaller categories based on specific characteristics (Mardiati, 2017). This understanding helps students identify patterns within the diversity of living organisms and comprehend the fundamental principles of biology.

The use of instructional media in teaching Natural Sciences (IPA) has a significant impact on student engagement, concept comprehension, motivation, and learning outcomes (Mudiana et al., 2021; Rahmatunnisa et al., 2022; Rahmi & Alfurqan, 2021; Sudibjo, 2019). Effective instructional media can enhance interaction between students and course materials, deepening their understanding. Therefore, the implementation of high-quality instructional media at Pondok Pesantren Darunnadwah is crucial to support the comprehension of IPA concepts, including understanding the topic of classifying living organisms.

Herbarium is one of the relevant forms of instructional media for the topic of classifying living organisms. Herbarium is a well-preserved collection of plant specimens used by botanists to identify and study plants (Lopes et al., 2019). Herbarium can be used to understand the principles of classifying living organisms in an interactive and in-depth manner. Moreover, the use of herbarium can also enhance students' interest in natural science and botany in general, as they have the opportunity to interact directly with real plant specimens, creating a profound and meaningful learning experience (Widjaya et al., 2023). As an instructional media, herbarium assists students in gaining a better understanding of the concept of classifying living organisms while enhancing their motivation to engage in learning (Holida & Wijastuti, 2018).

The primary objective of this research is to develop herbarium-based instructional media that can support the learning of classifying living organisms

for seventh-grade students at Pondok Pesantren Darunnadwah. It is hoped that through the use of this media, students will be able to identify various types of plants, understand their characteristics, and enhance their ability to classify living organisms accurately.

## METHODOLOGY

The research method employed in this study is Research & Development (R&D). This method is used to develop a product and evaluate its effectiveness (Pamungkas et al., 2020). The research development model used is the ADDIE model, which consists of several stages: Analysis, Design, Development, Implementation, and Evaluation (Rustandi & Rismayanti, 2021). The ADDIE model is used in the development of instructional products because it provides a structured approach and focuses on understanding needs, effective design, efficient development, targeted implementation, and comprehensive evaluation. Therefore, this model helps ensure that instructional products can be designed and tailored to the target users and learning objectives, thereby enhancing the quality and effectiveness of the product.

The product developed in this research is the Herbarium, designed to align with the topic of Classifying Living Organisms in the 7th-grade Science curriculum. The research subjects consisted of 1 Science teacher and 25 students from the 7th grade at Pondok Pesantren Darunnadwah. Data collection methods employed in the research included observations, interviews, and questionnaires. Observations and interviews were utilized to gather information about the existing issues, while questionnaires were used to assess the suitability of the Herbarium product based on validation from the teacher and feedback from the students. The product's suitability criteria were determined based on the average percentage score from each respondent, with the formula for calculating the average percentage and the suitability criteria as follows:

$$P = \frac{S}{\sum Sm} \times 100\%$$

Explanation:

P = Percentage score of suitability

S = Total score obtained from respondents

$\sum Sm$  = Total maximum score (Widoyoko, 2015)

Table 1. Criteria for Herbarium Product Suitability

Percentage (%)	Criteria
81 - 100	Very Worthy
61 - 80	Worthy
41 - 60	Decent Enough
21 - 40	Less Worthy
0 - 20	Not Worthy

## RESULTS

The development of the Herbarium media utilizes the ADDIE model with several stages: analysis, design, development, implementation, and evaluation. However, some stages, namely implementation and evaluation, could not be carried out due to time constraints, manpower limitations, resource constraints, and financial constraints (Widiastuti & Wirabrata, 2021).

### *Analyze*

The results of observations and needs analysis regarding instructional media at Junior High School Pondok Pesantren Darunnadwah indicate that the institution does not have a fully equipped laboratory facility. As a result, biology teachers rely on lecturing methods and the distribution of Student Worksheets (LKS) as aids to deliver the subject matter to students. The application of these methods is aimed at facilitating students' understanding of the material being taught. However, in the context of inadequate laboratory facilities, biology teachers face challenges in presenting materials that require practical work or direct observation. The limitations of existing instructional media make it difficult for teachers to convey non-verbalizable content. Therefore, efforts are needed to improve the development of interactive instructional media to facilitate more effective biology teaching at Junior High School Pondok Pesantren Darunnadwah.

One of the topics that is difficult to fully grasp using only lecture methods is the classification of living organisms. This subject requires more than just verbal explanations because it involves complex concepts and necessitates direct observation and interaction with various types of organisms. With the limitations of existing instructional media, students' understanding of the concept of classifying living organisms may not be optimal. Hence, there is a need to find alternative, more interactive ways to enhance comprehension. Therefore, this research aims to develop Herbarium media with a focus on the classification of living organisms.

### *Design*

This stage aims to design the media based on the previous analysis. In the design of creating the Herbarium media, the first step is to gather the plants that will be used, such as ferns, Asoka flowers, and paper flowers. The next step is to dry the plants by spraying them with alcohol and storing them in a book for approximately one week. Once all the plants are dry, the plant parts are arranged and affixed to manila paper. Afterward, the characteristics, structures, and classifications of the Herbarium plants are documented.

### *Development*

At this stage, the media to be developed is created in accordance with the previously prepared design. The appearance of the Herbarium media can be seen in Figure 1.



Figure1. Herbarium for the Classification of Living Organisms Material

After the Herbarium media was developed, the next step was to conduct a media test, which included validation by a science teacher and a trial run with seventh-grade students at Ponpes Darunnadwah. This was done to assess the suitability of the developed Herbarium media. The validation results from the science teacher showed 80% approval (very worthy), and similarly, the student responses from the Herbarium media trial had an average rating of 89.5% (very worthy). Based on these assessments, it can be concluded that there is no need for further revisions to the Herbarium media.

Table 2. The Teacher Validation Results

No.	Assessment Aspects	Percentage (%)	Criteria
1.	Ease of use of media	100	Very worthy
2.	Media can increase student interest and motivation	80	Very worthy
3.	Use of media in independent learning by students	60	Decent Enough
4.	Media can encourage students to think critically	80	Very worthy
5.	Contextual-based media (based on real life) that suits student characteristics	80	Very worthy
<b>Average</b>		80	Very worthy

The assessment of media usage in education reveals several important aspects. Firstly, the ease of media usage, with a rating of 100%, underscores the importance of accessibility and user-friendliness in learning. This creates an environment that supports active participation from all involved parties. Furthermore, media's ability to enhance student interest and motivation, rated at 80%, indicates its positive impact on student participation and engagement in learning. The media's capacity to stimulate critical thinking and context-based learning, in line with students' characteristics, also received a high rating of

80%. This demonstrates that the media successfully provides a relevant and meaningful learning experience.

However, there is an aspect that requires further attention, namely the use of media in self-directed learning by students, which received a rating of 60%, indicating potential for improvement. In the context of education, students' independence is crucial for the development of deeper skills and understanding. Therefore, the development of stronger strategies to encourage students to be more self-reliant in their learning could be a beneficial step. Overall, the assessment results underscore the importance of user-friendly media usage, the ability to enhance student interest and motivation, and the promotion of critical thinking in a context relevant to students' lives.

Table 3. Student Responses

No.	Assessment Aspects	Percentage (%)	Criteria
1.	Level of student interest in media	96	Very worthy
2.	The level of student boredom using media	80	Very worthy
3.	Level of enjoyment of using media.	88	Very worthy
4.	The level of ease in understanding the material using media	84	Very worthy
5.	The level of ease of understanding the language used	86	Very worthy
6.	The level of clarity of content in the media.	90	Very worthy
7.	Students' enthusiasm for using media	95	Very worthy
8.	Level of ease of use of media	96	Very worthy
9.	Use of media in students' independent learning	88	Very worthy
10.	Student interaction in media use	92	Very worthy
<b>Average</b>		89.5	Very worthy

Student responses to the use of herbarium media in biology learning indicate that interest, enthusiasm, engagement, and ease of understanding the content and language in the media are crucial aspects in enriching students' learning experiences

## DISCUSSION

The development of Herbarium on plant classification material for seventh-grade students at Pondok Pesantren Darunnadwah is a significant step in improving the quality of biology education. Herbarium is one form of learning media that can enable students to better understand and apply the concepts of plant classification. The development of Herbarium as a learning tool has the potential

to enhance students' understanding of plant classification material. Through Herbarium, students can learn directly about various types of plants, their characteristics, and how to classify them. This helps students develop a deeper understanding beyond relying solely on verbal explanations or textbook images. Additionally, Herbarium also stimulates students' observation, problem-solving, and critical thinking skills, as they need to identify and classify plants independently.

## CONCLUSIONS AND RECOMMENDATIONS

The results of the Herbarium media development research through the Research and Development (R&D) method have shown success in improving the quality of education. The development process through various stages of problem analysis, information collection, learning media creation, validation testing, and trials has yielded a learning media that is suitable for use. The validation testing results by the science teacher showed a percentage of 80% (very worthy), and the student response was 89.5% (very worthy). The students exhibited high enthusiasm during the learning process, and this learning media appears to enhance their motivation to learn. Therefore, the development of the Herbarium learning media serves as an attractive alternative for teachers to enhance the quality of education.

## FURTHER STUDY

This research certainly has its limitations and shortcomings. Therefore, it is hoped that future researchers can further develop more complex Herbarium media that encompasses all the stages of ADDIE, resulting in a product with criteria that are suitable, practical, and effective. Additionally, the development of Herbarium media can be extended to other relevant science subjects for instructional purposes.

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