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Feasibility of Booklet on the Utilization of Plants as Food Additives by the Montasik Community as a Reference for the Nutrition and Health Course

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Food additives are substances intentionally added to food to influence its properties and characteristics. These additives include food colorings and flavorings. Natural colorings are derived from plants that have the potential to produce color. The Nutrition and Health course discusses food sources and nutrients (nutritional substances) and their functions for health. The obstacle faced by students in the Nutrition and Health course is related to learning about the use of plants as food additives, specifically the need for additional reference material on natural additives. This research aims to analyze the feasibility test results of a booklet based on the research "Utilization of Plants as Food Additives by the Montasik Community" as a reference for the Nutrition and Health course. The approach used in this research is qualitative. The sampling method used is Purposive Sampling, which is sampling based on specific considerations. This research was conducted in the Faculty of Education and Teacher Training in March 2025. Data collection was carried out through validation questionnaires. Data were analyzed using percentage formulas. The validation by material experts resulted in a percentage of 84.7%, categorized as feasible for use, and the validation by media experts resulted in a percentage of 80%, also categorized as feasible for use. The average score obtained was 82.35%, indicating that the Booklet is Very Feasible for use

Keywords: Plants as Additives, Natural Dyes, Montasik Community, Nutrition and Health.

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INTRODUCTION

The Nutrition and Health course is a mandatory subject that must be completed by students of the Biology Education Study Program, Faculty of Tarbiyah and Teacher Training, UIN Ar-Raniry, Banda Aceh. This course carries a weight of 2 credit units. Nutritional science is a field that studies how food and nutrients affect human health. It encompasses various aspects, such as understanding nutrients in food, balanced dietary patterns, and the relationship between food, disease, and public health (Abidin, Z., et al., 2023). The scope of discussion in the Nutrition and Health course includes learning about Healthy Eating Patterns, Nutritious Food Ingredients, and Nutrient Sources in Food; within this material, there is discussion on food additives and addictive substances (Course Plan for Nutrition and Health, 2014).

The lecturer of the Nutrition and Health course stated that in learning activities, students conduct several practical activities such as market day and borax or dye testing using simple tests. Plants as natural dyes often discussed or used in learning activities are turmeric and suji leaves. The media used are reading references, but the types of plants as natural dyes are not discussed in detail. Interviews with several students who have taken the Nutrition and Health course revealed that students only have general and basic

knowledge about natural food dyes from plants and only know some commonly used natural dyes like pandan and turmeric, without realizing or knowing that many more dye-producing plants exist in their surroundings. In practical activities and even daily life, students often use artificial dyes like cake paste or instant food coloring, indicating a decline in the use of natural plant-based dyes, even though using natural plant dyes can increase the nutritional value of processed and consumed food. This is due to a lack of student knowledge about the types of plants that can be used as food additives, including natural dyes.

Additives are substances intentionally added to food to influence its properties and characteristics. According to the Ministry of Education and Culture, based on their function, food additives can be grouped into four categories: colorants, sweeteners, preservatives, and flavor enhancers. Colorants are substances used to provide and improve food color to produce a specific hue. Preservatives are added to extend the shelf life of food products by preventing or inhibiting microbial growth. Sweeteners are added to give a sweet taste to food. Flavor enhancers are used to improve the taste and aroma of food (Andriyani, P., et al. 2019: 75).

Food additives or Food Additives according to Indonesian Minister of Health Regulation No. 033 of 2012 are substances intentionally added to food to affect its nature or form. Various purposes of Food Additive application include maintaining and improving the nutritional value of food, inhibiting food spoilage by microbes, maintaining food freshness, color and aroma, aiding food processing, and improving food appearance (Kunarto, B., et al., 2021: 259). Based on origin, additives are divided into two: natural additives and synthetic additives. Natural additives come from plants, while synthetic additives come from chemical substances (Titin, T., 2020: 104). Natural dyes are coloring substances obtained from various types of dye-producing plants. Natural dyes are obtained from plant parts such as leaves, bark, fruit skin, seeds, roots, and flowers through processes like boiling, burning, crushing, pounding, and direct use (Linda, R. 2017: 303).

Montasik District is one of the districts in Aceh Besar Regency. Montasik is an area that still has rural regions with a pristine atmosphere and fertile soil, thus supporting diverse plant growth and minimal vehicle pollution. The Montasik area has extensive rice fields and community gardens for cultivating vegetables or other food crops, including plants with the potential to produce colors that can be utilized as food additives. Based on direct observation in the community environment of Montasik District, there are several types of plants used by the community as food and beverage additives. These plants come from crops or trees growing in the area, and some are cultivated by the community in gardens or around their homes. The utilization of plants as food additives by the Montasik community includes their use as natural coloring materials and food flavor enhancers. Types of plants used as natural dyes by the Montasik community include pandan leaves (*Pandanus amaryllifolius*) used to color cendol and sponge cake, turmeric (*Curcuma domestica* Val.) used to color yellow rice, butterfly pea flowers (*Clitoria ternatea*) to color beverages and bluish-purple rice, and purple sweet potato (*Ipomoea batatas* L.) used to color stick cakes and timphan cakes. Types of plants used as flavor enhancers include lemongrass (*Cymbopogon citratus*), kaffir lime (*Citrus hystrix* DC), pepper (*Piper nigrum*), and many others used in food processing.

The output produced from this research is a Booklet that can be used as an additional reference in learning, specifically for the Nutrition and Health course. Before the media is used and implemented in the learning process, testing on several feasibility assessment indicators, both from the media and material aspects, needs to be conducted. The assessment of the media feasibility test was carried out by media experts and material experts, such as lecturers of the Nutrition and Health course, so that the media can be deemed feasible as a learning medium. The feasibility test by media experts aims to obtain results, suggestions, and comments from expert validators so that the resulting learning media becomes a quality product suitable for use in the learning process.

METHODS

Research Design

The approach used in this research is qualitative. The sampling method used is Purposive Sampling, which is sampling based on specific considerations. This research was conducted in the Faculty of Education and Teacher Training in March 2025.

The population in this research were lecturers of the Biology Education Study Program, Faculty of Education and Teacher Training, UIN Ar-Raniry Banda Aceh. The sample consisted of 2 material expert lecturers and 2 media expert lecturers. Sampling was based on the consideration of lecturers who are experts in their respective fields. Sample selection was done using the Purposive Sampling technique.

Material

The research instrument is a tool used to collect research data, both qualitative and quantitative. The instruments used in this research were material validation questionnaires and media validation questionnaires. The output validation questionnaire contains assessment indicators for the output produced from this research to determine its feasibility. The validation questionnaire consists of material validation and media validation. Material validation test consists of aspects of content/material feasibility, material accuracy, and language feasibility in the book. Media validation test consists of several aspects: Format and Display, and Usability.

Data Analysis

This feasibility test was conducted to collect data regarding the quality of the Output produced and determine whether the Output produced is feasible for use. The material validation test consists of aspects of content/material feasibility, material accuracy, and language feasibility in the book. The media validation test consists of several aspects: Format and Display, and Usability. The formula used to determine the feasibility of the output produced is:

$$P = \frac{F}{N} X\ 100$$

Description:
P = effectiveness percentage
F = Total score achieved by respondents
N = Maximum score
100 = Constant value

Table 1 *Percentage Category for Feasibility Test of Research Output (Wulandari 1, Y:2017)*

Interval Percentage	Criteria
85%—100%	Very Feasible
65%—84%	Feasible
45%—64%	Fairly Feasible
0%—44%	Not Feasible

RESULTS

The feasibility test results for the Booklet on the study of plants as natural colorings and food flavorings in Montasik District as a reference for the Nutrition and Health course are presented in the form of a Booklet. The Booklet serves as an educational information media compiled to introduce and explain the utilization of various types of plants as natural food colorings used by the Montasik community. The Booklet resulting from this research

can be used as a reference for the Nutrition and Health course by students for knowledge. The cover display of the booklet can be seen in Figure 1.

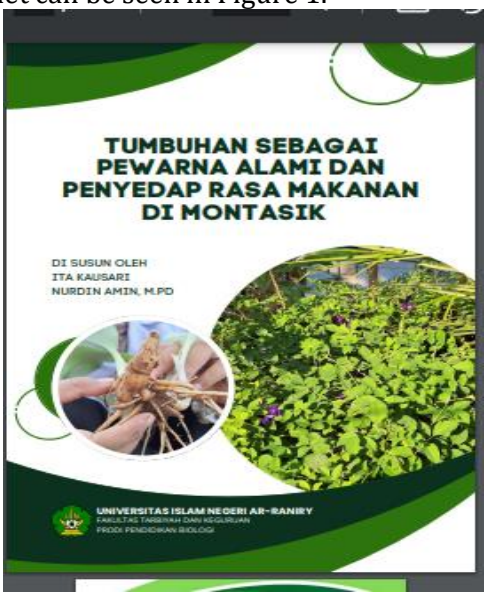

Figure 1. Cover of the booklet

The feasibility test of the Media Booklet on plants as natural colorings and food flavorings in Montasik District was conducted by media expert lecturers and material expert lecturers using media validation sheets and material validation sheets. The feasibility test of the Media Booklet was conducted to determine whether the Booklet media is feasible for use. The following are the results of the feasibility test of the Media Booklet on plants as natural colorings and food flavorings in Montasik District conducted by media expert and material expert lecturers.

a. Material Feasibility Test Results

Table 2. *Material Feasibility Test Results*

No	Assessment Aspect	Score Obtained	Max Score	Percentage	Category
1	Content/Material Feasibility	31	35	88,5%	Very Feasible
2	Material Accuracy	12	15	80%	Feasible
3	Language Feasibility	20	25	80%	Feasible
4	Contextual	9	10	90%	Very Feasible
	Total Overall Aspect	72	85	84.7%	Feasible

Based on Table 2, it shows that the results of the material feasibility test of the Booklet validated by material expert validators obtained a total score of 72 out of a maximum score of 85, with an overall feasibility percentage of 84.7% and included in the Very Feasible category. The content or material feasibility aspect obtained a score of 31 out of 35 with a percentage of 88.5%, included in the Very Feasible category. The material accuracy aspect obtained a score of 12 out of 15 with a percentage of 80%, included in the Feasible category. The language feasibility aspect obtained a score of 20 out of 25 with a percentage of 80%, included in the Feasible category, and the contextual aspect obtained a score of 9 out of 10 (90%) and was included in the Very Feasible category.

b. Media Feasibility Test Results

Table 3. *Media Feasibility Test Results*

No	Assessment Aspect	Score Obtained	Max Score	Percentage	Category
1	Format and Display	32	40	80%	Feasible
2	Usability	12	15	80%	Feasible
	Total Overall Aspect	44	55	80%	Feasible

Based on Table 3, it shows that the results of the media feasibility test of the Booklet validated by media expert validators obtained a total score of 44 out of a maximum score of 55, with a feasibility percentage of 80% and included in the Feasible category. The format and display aspect obtained a score of 32 out of 40 with a percentage of 80%, included in the Feasible category. The usability aspect obtained a score of 12 out of 15 with a percentage of 80%, included in the Feasible category, indicating that this booklet is quite beneficial and can be used as a relevant source of information or learning media. Overall, in terms of media aspects, this Booklet is judged Feasible in terms of format and functionality. The results of the material and media feasibility tests determine the overall feasibility of the booklet; the data from both can be seen in Table 4.

Table 4. *Media Feasibility Test Results*

No	Assessment Aspect	Score Obtained	Max Score	Percentage	Category
1	Material Feasibility	72	85	84.7%	Feasible
2	Media Feasibility	44	55	80%	Feasible
	Overall Aspect			82.4%	Feasible

The percentage of media feasibility of the booklet can be seen in Figure 2 below.

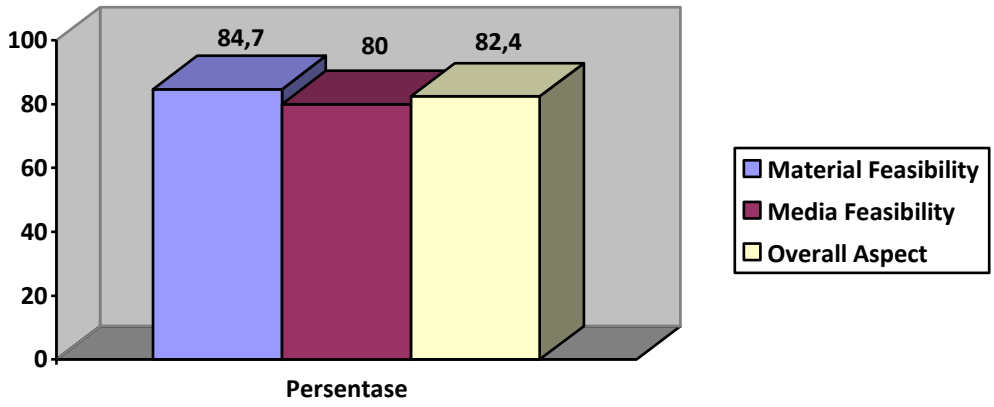

Figure 2. *Graph of Booklet Feasibility Percentage*

Based on Figure 2, the percentage of material feasibility of the booklet is 84.7% with feasible criteria. Meanwhile, the percentage of media feasibility of the booklet is 80%, so the overall feasibility obtained is 82.4% with feasible criteria. The compiled Booklet has met the feasibility standards as an informative, attractive, and relevant learning media for use by students in understanding the utilization of plants as natural food colorings and flavorings.

DISCUSSION

Based on the research results, the material feasibility of the booklet obtained a feasible category (84.7%). The *content feasibility* aspect reaching 88.5% (Very Feasible category) indicates that the material coverage is in accordance with learning objectives, systematic, and supports understanding of the concept of natural additives (Sugiyono, 2019). The high score in the *contextual* aspect (90%) proves the main strength of this booklet, which is its ability to link nutritional theory with concrete local potential. This is in line with the principles of Contextual Teaching and Learning, which emphasizes the relevance of material to students' real lives (Johnson, 2002). However, the *material accuracy* and *language* aspects each obtained 80% (Feasible category). This indicates that

although accurate and easy to understand, there is still room for improvement, for example in the depth of scientific explanation or consistency in the use of technical terms.

In terms of media feasibility, the booklet obtained a score of 80% (Feasible category). The *format and display* and *usability* aspects both achieved 80%. This shows that the booklet has met the basic criteria for good learning media: visually appealing, easy to use, and functions well as a source of information (Arsyad, 2019). However, the score that has not reached the "Very Feasible" category implies that graphic design, layout, or variation of visual elements (such as images and illustrations) can still be improved to be more engaging and facilitate reader understanding (Mayer, 2021).

Overall, the percentage calculation resulted in a feasibility score of 82.4% (Feasible criteria). This figure confirms that this booklet has met the minimum standards as an informative, relevant, and reliable learning media (Prastowo, 2019). The strength of the booklet lies in its rich, down-to-earth contextual material, linking nutritional science with the local wisdom of the Montasik community. This strength is a significant added value compared to conventional reference sources. Therefore, with some minor improvements in language aspects, detail accuracy, and display design, this booklet is highly recommended for implementation in learning. Its use is expected to increase students' interest, understanding, and appreciation for the utilization of local natural resources in the context of nutrition and health.

CONCLUSION

Based on the research results on the feasibility of the booklet "Utilization of Plants as Food Additives by the Montasik Community" as a reference for the Nutrition and Health course, it can be concluded that the Booklet, based on assessment by material experts, obtained a percentage of 84.7%, categorized as feasible for use, and the assessment by media experts obtained a percentage of 80%, also categorized as feasible for use. The average value obtained was 82.35%, indicating that the Booklet is Very Feasible for use.

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