

## **Development of Teaching Materials in Identifying Ornamental Plants In The Garden of Eden 100 Lumban Julu Tobasa**

Nurhasnah Manurung<sup>(1)</sup>; Masnadi M<sup>(2)</sup>; Pandu Prabowo Warsodirejo<sup>(3)</sup>; Ridha Harlida Yana<sup>(4)</sup>

<sup>(1,2,3)</sup> *Lecturer of Biology Education Program UISU FKIP*

<sup>(4)</sup> *Graduate of Biology Education Program UISU FKIP*

*Islamic University of North Sumatera (UISU) Medan*

*Email : nurhasnahmanurung1965@gmail.com; masnadim@fkip.uisu.ac.id;*

*coolpandu606@gmail.com; army.meidytyarni@gmail.com*

### **ABSTRAK**

Penelitian ini bertujuan untuk: (1) mendapatkan data tanaman hias di Taman Eden 100: (2) mengembangkan modul sebagai pengembangan bahan ajar dari modul taksonomi tinggi tipe Angiospermae: (3) untuk mengetahui cara mengklasifikasikan tanaman hias. Jenis penelitian ini adalah pengembangan penelitian yang menggunakan metode penelitian dan pengembangan (Research and development) adalah metode penelitian yang digunakan untuk menghasilkan produk tertentu dan menguji efektivitas produk tersebut. Produk akhir dari penelitian pengembangan ini adalah Module. Desain penelitian yang digunakan dalam penelitian ini adalah desain pengembangan 4D (Four-D Model) yang terdiri dari 4 tahap pengembangan: Tentukan, Desain, Pengembangan dan Diseminasi. Subjek tes terdiri dari Fase I yang terdiri dari dua siswa Semester VI, Fase II dua siswa Semester VI, kemudian tes kelompok besar yang terdiri dari semua siswa FKIP BIOLOGI UISU Semester VI. Data kualitas produk dihasilkan dengan teknik dan analisis dengan teknik analisis deskriptif hasil penelitian kuantitatif; (1) Hasil uji coba fase I dengan rata-rata rata-rata 83,28 dan nilai rata-rata aspek 82,62, (2) uji coba fase 2 dengan rata-rata rata-rata 84,42 dengan rata-rata aspek 84, (3) uji coba fase III dengan rata-rata 83,33 dengan rata-rata aspek 83,20. Jadi dapat disimpulkan bahwa hasil skor tes berdasarkan nilai rata-rata aspek uji fase I, tahap II dan tahap III dengan jumlah 83,27, secara keseluruhan rata-rata 83,47 dapat dikatakan bahwa modul tersebut sesuai karena kriteria mencapai 67,18-85,93 maka modul tersebut cukup valid (tidak direvisi).

***Kata kunci: Pengembangan, Penelitian, 4-D (Four D Model), Tanaman Hias***

### **ABSTRACT**

*This study aims to: (1) to obtain data of ornamental plants in the Garden of Eden 100: (2) develop the module as the development of teaching materials from the high taxonomy module of Angiospermae type: (3) to know how to classify ornamental plants. This type of research is a research development that uses research and development methods (Research and development) is a research method used to produce a particular product and test the effectiveness of the product. The end product of this development research is the Module. The research design used in this research is the design of 4D development (Four-D Model) which consists of 4 development stages: Define, Design, Development and Disseminate. The test subjects consisted of Phase I consisting of two students of Semester VI, Phase II of two students of Semester VI, then a large group test consisting of all students of FKIP BIOLOGI UISU Semester VI. Data of product quality produced by technique and analysis with descriptive analysis technique of quantitative research result; (1) Results of phase I trials with mean averages of 83.28 and average aspect values of 82.62, (2) Phase 2 trials with mean averages of 84.42 with average aspects 84, (3) phase III trials with an average of 83.33 with an average aspect of 83.20. So it can be concluded that the results of test scores based on the average value of aspects of the test phase I, stage II and stage III with the number of 83.27, the overall average of 83.47 can be said that the module is appropriate because the criteria reaching 67,18-85,93 then the module is quite valid (not revised).*

***Keywords : Development, Research, 4-D(Four D Model), Ornament Plants***

## **A. INTRODUCTION**

Learning is the process of interacting students with educators and learning resources in a learning environment. Learning is assistance provided by educators so that knowledge and knowledge acquisition, mastery of skills and character can occur, as well as the formation of attitudes and beliefs in students. In other words, learning is a process to help students learn well. In its implementation, the learning model must require teaching material as a reference. The instructional material in question is all forms of material used to assist teachers / instructors in carrying out teaching and learning activities in class. Material can be in the form of written or unwritten material. In the development of teaching materials can be sourced from media modules that will become teaching materials that will help to identify the plants that exist in the environment and the surrounding environment, for example in the forest. Forests can be used as a learning resource in the development of teaching materials, such as in the Garden of Eden 100, because forests have a variety of plants and animals. One proof of the natural wealth of Toba Samosir Regency is the existence of the Eden Park 100, which is more focused on environmental conservation and tourism. The Garden of Eden 100 is located above 1,100 s.d. 1,750 meters above sea level. This park is in the hills of North Sionggang village, Lumban Julu District, Toba Samosir Regency, North Sumatra. Eden Park 100 has beautiful natural charm, such as waterfalls, cave bats, manja hill (lake toba view), toba orchid garden, wild nature, and can also be used for tracking, and camping ground, the condition of the forest in this park still seems natural, rich in flora and fauna, such as the presence of Sumatran tigers and bats. The current state of forests in Indonesia is very concerned about and in a critical condition as it continues to experience depreciation every year. Every year there is forest depreciation due to oil palm plantations, mining, and human settlements. Moreover, coupled with the existence of illegal logging or illegal logging due to illegal activities. It is estimated that forests in Indonesia are shrinking 1.5 million hectares annually. According to data from the Indonesian Forestry Department in 2006, the area of degraded forest that cannot function optimally has reached 59.6 million hectares of 120.35 million hectares of forest areas in Indonesia. If conditions like this continue to occur, then

Sumatra and Kalimantan will lose forest areas, of course we all don't want that to happen. Other causes of forest destruction are not only due to oil palm plantations, mining, settlements, or illegal logging, forest destruction is also caused by weak forest stabilization which is characterized by poor management of forest resources. Ornamental plants include all plants, either in the form of terna, creeping, shrubs, shrubs, or trees, which are intentionally planted as a component of the garden, home garden, decorating rooms, ceremonies, makeup / clothing components, or as a component of floral arrangements. Cut flowers can also be included as ornamental plants. In the general context, ornamental plants are one of the groupings based on the function of horticultural plants. Parts that are used by people are not only flowers, but the impression of beauty that is raised by this plant. In addition to flowers (color and aroma), leaves, fruit, stems, even pepagan can be used as components. Based on the above, a lot of biodiversity includes ornamental plants from low-level plants to high-level plants, especially in the Lumban Julu 100 Eden Garden, but in the research the PDUPT Research Team Umbrella was only limited to high-level Angiospermae plants. This study classifies the types of ornamental plants in the Eden Garden 100 Lumban Julu Tobasa.

## **B. RESEARCH METODOLOGY**

The research steps that will be carried out are as follows:

### **a. Preparation Stage**

The preparation stage is: (1) Request permission to conduct research. (2) Make observations to the Eden Park to identify ornamental plants. (3) Look for relevant literature / literature review references. (4) Hold consultation with thesis supervisor. (5) Make a proposal. (6) Following the proposal seminar.

### **b. Implementation Phase**

There is also an implementation stage that has been designed as follows: (a) Make a visit to the Lumban Julu 100 Eden Park. (b) Make observations in the field. (c) Identifying ornamental plants in the Lumban Julu 100 Eden Garden. (d) Observing the experts when explaining the ornamental plants in the Lumban Julu 100 Eden Garden. (e) Assessment of instruments for students of FKIP UISU Biology. (f) Documentation taking in the form of research photos in Eden Park 100 Lumban Julu.

Research and development methods (Research and development) are research methods used to produce certain products and test the effectiveness of these products. The research design used in this study was a 4D (Four-D Model) development research design which consisted of 4 development stages namely defining (Design), Design (Design), development (Develop), and Disseminate. This development research produced a product in the form of a module that was tested limited in FKIP BIOLOGI UISU with the subject of student research in the Forest Garden Eden 100. But in this study only used until the third stage. The data in this study will be analyzed descriptively qualitative. The data analyzed includes the feasibility of learning media, motivation scores, while analyzing can be done in the following ways: Analysis of module feasibility, Qualitative assessment of teaching materials is done through an assessment checklist. The assessment results from expert lecturers in the form of product quality are encoded with a qualitative scale and then qualitative values are converted into quantitative values with the following conditions: SB (very good) score 5, B (Good) score 4, C ( Enough) score 3, K (less) score 2, SK (very less) score 1.

## **1. Identification of Plant Types**

Samples of ornamental plants that have been identified in Taman Eden 100 Lumban Julu, in the following ways(1). Ornamental plant samples were identified with lecturers and plant experts (2) Samples of plant species are identified by the determination book.

### **Research Procedure**

#### **Research Procedure A**

The research steps that will be carried out are as follows:

1. Preparation Stage  
The preparation stage is:
  - a) Request permission to conduct research.
  - b) Make observations to the Eden Park to identify ornamental plants.
  - c) Look for relevant literature / literature review references.
  - d) Hold consultation with thesis supervisor.
  - e) Make a proposal.
  - f) Following the proposal seminar.
2. Implementation Phase

There is also an implementation stage that has been designed as follows:

- a) Make a visit to the Lumban Julu 100 Eden Park.
- b) Make observations in the field.
- c) Identifying ornamental plants in the Lumban Julu 100 Eden Garden.
- d) Observing the experts when explaining the ornamental plants in the Lumban Julu 100 Eden Garden.
- e) Assessment of instruments for students of FKIP UISU Biology.
- f) Documentation taking in the form of research photos in Eden Park 100 Lumban Julu.

#### **Research Development Procedure B**

Sugiyono (2013: 297) research and development methods (Research and development) are research methods used to produce certain products and test the effectiveness of these products. The research design used in this study was a 4D (Four-D Model) development research design which consisted of 4 development stages namely defining (Design), Design (Design), development (Develop), and Disseminate. This development research produced a product in the form of a module which was tested limited in FKIP BIOLOGI UISU with student research subjects in the Forest of Eden Park 100

## **2. Data Analysis Technique**

The data in this study will be analyzed descriptively qualitative. The data analyzed includes the feasibility of learning media, motivation scores, while analyzing can be done in the following ways:

- a. Analysis of module feasibility

Qualitative assessment of teaching materials is done through an assessment checklist. The assessment results from expert lecturers in the form of product quality are encoded with a qualitative scale and then the qualitative values are converted into quantitative values with the following conditions:

Data analysis techniques for the feasibility of modules through validation sheets are carried out by the following steps: Tabulation of all data obtained for each component of the assessment items available in the assessment instrument.

Menghitung the average total score of each component using the formula  $X = \frac{\sum X}{n}$  Information:

$X$  = average score for each aspect

$\sum X$  = number of scores per aspect

N = number of values

Teaching Material Development Data (Module)

The following are the results of the questionnaire that was tested to students as many as 3 stages of testing. That is :

- a. Phase I Test = 2 students with random sampling
- b. Phase II Test = 2 students with random sampling
- c. Test Phase III = Large group test that is all fourth semester students of Biology Education Study Program totaling 21 people

Teaching Material Development Data (Module) The data used is data that uses questionnaires addressed to students of Biology Education Study Program FKIP UISU Medan, divided into 3 phases, namely:

- 1) Stage I:  
In the form of product quality data in terms of the quality of the module aspects as media for teaching materials, namely: Introduction, thinking logic, display, text format, colors, images, presentations, templates, species images and species tables.
- 2) Phase II:  
In the form of product quality data in terms of material content aspects, namely: Suitability of material, relevance to learning, clarity of learning topics, material suitability, material completeness, ease of use, ease of understanding the material.
- 3) Phase III:  
In the form of final data obtained from large group tests (the total sample of the total number of students is 1 class in the sixth semester), namely: increasing knowledge, ease of use, increasing motivation, ease of understanding the material, clarity of instructions for use, language use, use of letters, color usage giving illustrations, using Latin names

## **C. RESULT AND DISCUSSION**

### **1. Description of Research Data**

- a) Research Results  
This research was conducted in the area of Eden Park 100 Lumban Julu Tobasa, Desa Sionggang Utara, Kec. Lumban Julu, Kab. Toba samosir with an area of 40 hectares and the

area under study is 1 hectare. The collection of species sample data is only focused on the group of ornamental plants in the forest of Eden Park 100 Tobasa Lumban Julu North Sumatra.

- b) Data on Identification of Types of Ornamental Plants in Eden Park 100.

#### **2. Family Number of Genus :**

(1). Scrophulariaceae 1 Angelonia 1, (2). Compositae 2 Ageratum 1(3). Opocynaceae 1 Allamanda 1 (4). Asparagaceae 4 Cordyline 1(5). Araceae 7 Anthurium 1(6). Orchidaceae 24 Aglaonema 1 (7). Begoniaceae 2 Phalaenopsis 1 (8). Nyctaginaceae 1 Liparis 1(9). Solanaceae 5 Bulbophyllum 5(10). Cannaceae 1 Neuwiedia 1 (11). Compositae 1 Cymbidium 1 (12). Acanthaceae 3 Spathoglottis 2 (13). Iridaceae 3 Paphiopedilum 1 (14). Gesneriaceae 1 Macodes 1(15). Leguminosae 2 Acriopsis 2 (16). Portulacaceae 1 Dendrobium 2 (17). Euphorbiaceae 5 Gastrochilus 1 (18). Turneraceae 1 Pholidota 1 (19). Melastomataceae 1 Arundina 1 (20). Magnoliaceae 1 Coelogyne 2 (21). Cupressaceae 3 Dilochia 1 (22). Araucariaceae 1 Lysimachia 1 (23). Casuarinaceae 1 Begonia 2 (24). Amaryllidaceae 1 Bougainvillea 1 (25). Fabaceae 1 Browallia 1 (26). Lyliaceae 1 Brugmansia 2 (27). Asteraceae 1 Canna 1 (28). Leguminoceae 3 Dahlia 1 (29). Zingiberaceae 3 Ruellia 1 (30). Musaceae 2 Neomarica 2 (31). Heliconiaceae 1 Aeschynanthus 1 (32). Solanaceae 3 Bauhinia 1 (33). Amaranthaceae 1 Belacanda 1 (34). Nepenthaceae 3 Ruella 1 (35). Marantaceae 1 Portulaca 1 (36). Equiminoceae 1 Jatropha 1 (37). Labiate 3 Turnera 1 (38). Maluaceae 1 Chrysothenis 1 (39). Cannaceae 2 Medinilla 1 (40). Rutaceae 1 Michelia 1 (41). Oleaceae 1 Juniperus 2 (42). Balsaminaceae 1 Thuja 1 (43). Myrtaceae 1 Araucaria 1 (44). Aspleniaceae 1 Casuarina 1 (45). Cycadaceae 1 Curculigo 1(46). Amaryllidaceae 1 Erythrina 1 (47). Lamiaceae 3 Dracaena 2 (48). Pteridaceae 1 Asparagus 1 (49). Apocynaceae 1 Anaphalis 1 (50). Delonix 1 (51). Alpinia 1 (52). Heliconia 3 (53). Cestrum 1 (54). Celosia 1 (55). Jatropha 1 (56). Nepenthes 3 (57). California 1 (58). Calliandra 2 (59). Orthosiphon 1 (60). Hibiscus 1 (61). Caesalpinia 1 (62). Cananga 1 (63). Canna 1 (64). Datura 1 (65). Murraya 1 (66). Eetlingera 1 (67). Castuba 1 (68). Coleus 3 (69). Alocasia 1 (70). Colacasia 1 (71). Caladium 2 (72). Solanum 2 (73).

Zingiber 1 (74). Pachystachys 1 (75). Jasminum 1 (76). Impatiens 1 (77). Eupharbia 1 (78). Syzygium 1 (79). Asplenium 1 (80). Philodendron 1 (81). Codiaeum 1 (82). Cycas 1 (83). Polianthes 1 (84). Salvia 1 (85). Adiantum 1 (86). Catharanthus 1 (87). Lavandula 1. Number of Family 102 Number of Genus 109

Based on the table above it can be seen how many families and genus found in Eden Park 100 based on the results of these studies with the number of families as many as 102 families and the number of genera obtained as many as 109 genera.

**3. Discussion**

From the results of research data obtained species of species in the Garden of Eden 100 very much a diversity of ornamental plants in the Garden of Eden from native plants from the Garden of Eden and there are Endemic Plants. In this study I limit the High Plant Taxonomy. Forest plants and trees also grow well around the Eden Park area 100 such as ingul, mindi, sampinur bunga, sotul, aren, aturmangan. And the growth of various types of flora in the Garden of Eden 100 such as the Stories (Nephenthes), Batak Flowers (Macodes Petola), Soripada Flowers (Malakis sp) and various types of rare orchids. these plants are native plants of the Garden of Eden 100, while endemic plants are as follows: fig or tin trees whose seeds are intentionally imported directly from Israel, butter nut trees from the amazon forest, both of which are very thriving in the forest of Eden 100.

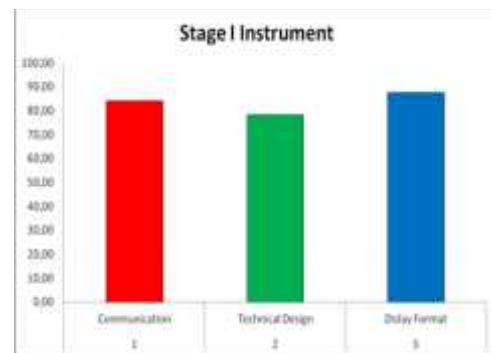
Then it can be seen that the most number of families is the family of Orchidaceae as many as 24 and in the genus of Bulbophyllum as many as 5 types of genera, so the most abundant is more dominant in the family Orchidaceae and genus Bulbophyllum.

According to Sugiono (2015: 396-401) the method of research and development (Research and Development) is a research method used to research in an effort to develop existing products (innovation) and create new products (creations). To get the results of this study using the development of 4 D (Four-D Model) which consists of 4 stages of development namely defining (Define), design (Design), development (Develop), and dissemination (Disseminate). But in this study only use up to stage III, namely at the stage (Develop), at this stage using the developmental testing development test), namely the field trial is carried out to obtain direct input in the form of responses, reactions, comments of students, and

observers to the device learning that has been compiled.

According to Thiagarajan, et al. (1974) trials, revisions and trials were continued to be carried out until a consistent and effective device was obtained. Then in phase I I took a sample of the students of FKIP BIOLOGI SEM VI to represent the assessment of the module that I tested and then I took a random sample of 2 students, then in the second stage it was done in the same way as stage I then in stage III I took a sample with all students of Biology Sem VI.

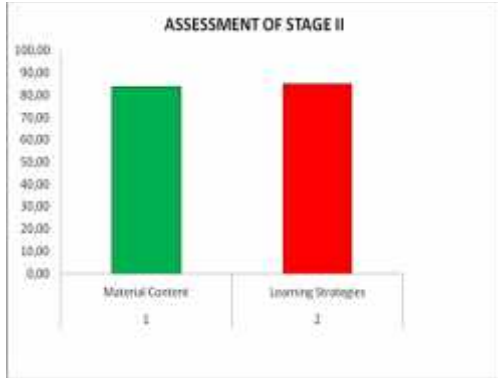
Then the data obtained with the results in (1) stage I with the results of phase I trials with an average of 83.28 and an average value of 82.62 aspects, (2) Phase 2 trials with an average of 84.42 with average aspect 84, (3) stage III trial with an average of 83.33 with an average aspect of 83.20. So it can be concluded that the results of the trial value based on the average value of the aspects of the test phase I, stage II and stage III with a total value of 83.27, then the overall average of stages I, II and III 83.47 it can be said that the Module is Eligible used because the module's assessment criteria reached 67.18 - 85.93



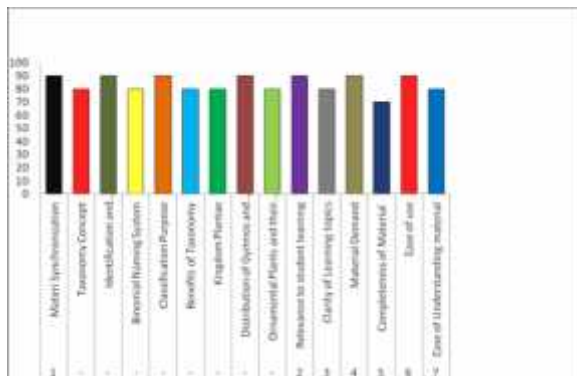
from 2 students randomly selected from 21 people taken from 10%, the assessor obtained the % Feasibility result, namely; (1) Communication obtained a Feasibility% of 84.00%, (2) Technical design obtained a Feasibility% of 78.33%, and (3) The display format obtained a % feasibility of 83.28%.



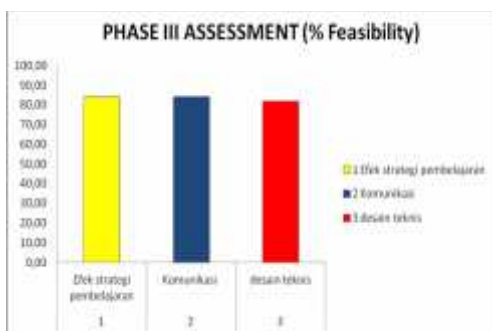
From the Chart Bar chart above we can see that the highest value from the results of the stage 3 assessment is in point 13 on the Use of Templates with a value of 100



of the 2 students as assessors obtained the results of the % Feasibility, namely; (1) Contents of Materials obtained % Feasibility of 83.85%, (2) Learning strategies obtained % Feasibility of 85.00%, with an average of 84.42



From the Chart Bar chart above we can see that the highest value from the assessment results in stages 1,2,4 and 6 with the same value of 90.



from the large group, namely as many as the number of students of FKIP UISU Sem VI as

the assessor obtained the results of the % Feasibility, namely; (1) Effect of learning strategies to obtain Feasibility% of 84.00%, (2) Communication obtaining % Feasibility of 84.00% (3) technical design, with an average of 82.00%. with an average of 83.33%

## D. CONCLUSION

### Conclusion Of The Results Of This Research Is

1. Based on the products produced from the development of teaching materials this research is in the form of modules. After going through the stages of study and trial to students of FKIP BIOLOGI UISU in the sixth semester, it can be concluded that the final product of teaching materials namely modules is considered very effective as reading material or teaching material for learning materials of high plant taxonomy for students of FKIP BIOLOGI UISU.
2. Based on the results of the data obtained from the research data obtained species of species in Eden Park 100 very large diversity of ornamental plants in the Eden Park from plants and forest trees also grow well around the area of Eden Park 100 like ingul, mindi, sampinur bunga, sotul, aren, aturmangan. And the growth of various types of flora in the Garden of Eden 100 such as the Stories (Nephenthes), Batak Flowers (Macodes Petola), Soripada Flowers (Malakis sp) and various types of rare orchids. these plants are native plants of the Garden of Eden 100, while endemic plants are as follows: fig or tin trees whose seeds are intentionally imported directly from Israel, butter nut trees from the amazon forest, both of which are very thriving in the forest of Eden 100.
3. Based on the total number of Family and Genus can be deduced from the family Orchidaceae as many as 24 and in the genus of Bulbophyllum as many as 5 types of genus, so the most so the more dominant, namely the family Orchidaceae and genus Bulbophyllum.

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