

# *The Development of Guided Inquiry-Oriented Plant Morphology Practicum Guides for Biology Education Students of IPTS Padangsidimpuan*

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**Abstract** - The aims of this study was to describe of practicality of plant morphology practicum guide book was oriented guided inquiry at the third semester students of Biology Department of IPTS (Institut Pendidikan Tapanuli Selatan). The approach used qualitative method with 24 students as the sample and they were taken by using total sampling technique. Practicality questionnaire was used for students and lecturer of IPTS. The result of the research showed 1) the average of students' questionnaire was 97.7% (very practical) and 2) the average of lecturer's questionnaire was 85.22% (very practical).

**Keywords** - Practical Guide, Guided Inquiry, Plant Morphology.

## I. INTRODUCTION

Education is expected to be able to provide opportunities for students to experience the 4 pillars of education, namely 1. Learning to learn, namely how students learn about the information around them from the amount of information available, 2. Learning to be, namely how students recognize themselves and can adjust themselves with their environment, 3. Learning to do is in the form of actions or activities to make ideas related to science and technology, 4. Learning to be together is how we live in a society that is interdependent with one another, so as to be able to respect others and work with each other the same and still be able to compete in a healthy manner (UNESCO (Novalianti, 2012: 16)).

Where education is not only emphasized in mastering the material, but also emphasized the mastery of skills. Currently lecturers in biology are required to understand the process of concept discovery which involves basic skills

through scientific experiments carried out through practical activities. Because students need the practice of applying the theory directly to get a better meaning from the material being studied. There are four main reasons for the importance of implementing practical activities according to Subianto (2009: 8). One, arouse students' learning motivation; two, develop basic skills in carrying out experiments; three, a vehicle for learning scientific learning approaches; four, support the understanding of subject matter. By doing practicum, students will be motivated, skilled and easy to understand concepts in science learning.

Practicum is a laboratory activity as a support for plant morphology courses. Practicum activities can bring students to experience the process of thinking, from this activity students are dealing directly with a problem related to the material being studied and given the opportunity to solve the problem, this makes it easier for students to understand the subject matter provided. Practicum provides opportunities

for students to prove theory, find theories, or evaluate theories. One of the supporting activities of the practicum is the practice guide. Practicum guides generally contain instructions for practicum activities for example practicum objectives, tools and materials to be used, work procedures, there is free space for data to be reported, tables to be filled and problems. This is in line with Arifin's opinion (Sri Kusumastuti, 2008: 16), that in general practicum instructions contain practicum titles, practical goals, theoretical basis, tools and materials, ways of working and observations, questions and bibliography. Based on several practical guiding understandings above, it can be concluded that the practical guide book is a book that contains instructions / procedures for conducting practical activities.

Based on the reality in IPTS Padangsidempuan, there were several problems regarding the implementation of practicum in plant morphology courses, one of which was the guidebook used in the cookbook model and the morphology practicum guide used which was not guided inquiry based. a steps in scientific activities that involve the full extent of all student abilities. This is the background of the authors developing the guidance of guided inquiry-oriented plant morphology practicum for biology education students of IPTS Padangsidempuan, which aims to plant morphology practicum activities can increase motivation, activities, and student learning outcomes.

This guided inquiry was chosen because the characteristics of Guided Inquiry are a learner-centered learning process. Halim (2010: 23) states the characteristics of inquiry that need attention are as follows: a). Learners develop the ability to think through specific observations to make infertions or generalizations. b). The aim is to study the process of observing an event or object and then arrange the appropriate generalization. c). The teacher controls certain parts of the learning, for example the material and acts as a class leader. d). Each student tries to build a meaningful pattern based on the results of his observations in class. e). It is hoped that the class will function as a learning laboratory. f). A certain number of generalizations

will be obtained from students. g). Students are motivated to communicate the results of their generalizations that later can be used by other students in the class.

## II. METHODS

The development method used in this study is the Plomp model. According to Plomp (2013: 19) the stages of the study consisted of the top, initial investigation phase (preliminary research phase), the stage of developing and making prototypes (development or prototyping phase) and the assessment phase (illustrated phase) illustrated in Figure 1.

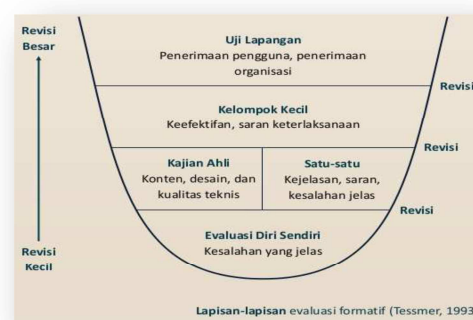


Figure 1. Formative Evaluation Layers of the Plomp Development Model (Source: Tessmer (Plomp and Nieveen (2013: 36)).

Based on Figure 1. above formative evaluation activities carried out through self-evaluation (self-evaluation); expert review; individual evaluation (one-to-one evaluation); small group evaluation (Small Group Evaluation); and field tests.

## III. RESULTS AND DISCUSSION

### 1. Practicality test results by the lecturer

Practicality test results by lecturers using the practicality questionnaire showed very practical criteria with an overall average value of 85.22%. The results of practicality tests by lecturers can be seen in Table 1.

Table 1. Results of Practicality by lecturers

| No        | Aspek yang dinilai                      | Tingkat ketercapaian (%) | Kategori       |
|-----------|-----------------------------------------|--------------------------|----------------|
| 1         | Kemudahan penggunaan penuntun praktikum | 81,25                    | Sangat praktis |
| 2         | Waktu yang diperlukan dalam pelaksanaan | 87,5                     | Sangat praktis |
| 3         | Mudah menginterpretasikan               | 100                      | Sangat praktis |
| 4         | Memiliki ekuivalensi                    | 87,5                     | Sangat praktis |
| Rata-rata |                                         | 85,22                    | Sangat praktis |

Based on Table 1, it can be seen that the value of ease of interpretation has the highest value of all aspects assessed at 100% with a very practical category, this is because the practicum guides developed can be easily understood by lecturers. The ease of use of practical guidelines is 81.25% with a very practical category. While the time value required in the implementation and has the equivalent has the same value, namely 87.5% with a very practical category. This

shows that the practicum guide developed has been used properly as a practical guide.

## 2. Practicality guided inquiry-oriented practicum guided by students.

Practicality questionnaire was given to students after attending the practicum using guided inquiry-oriented plant morphology practicum guides. The results of practicality tests by students can be seen in Table 2.

Table 2. Results of Practicality by Students

| No        | Aspek yang dinilai                      | Tingkat ketercapaian (%) | Kategori       |
|-----------|-----------------------------------------|--------------------------|----------------|
| 1         | Kemudahan Penggunaan Penuntun Praktikum | 90,4                     | Sangat praktis |
| 2         | Waktu yang Diperlukan dalam Pelaksanaan | 91,6                     | Sangat praktis |
| 3         | Mudah menginterpretasikan               | 94,4                     | Sangat praktis |
| 4         | Memiliki Ekuivalensi                    | 90,5                     | Sangat praktis |
| Rata-rata |                                         | 97,7                     | Sangat praktis |

Based on Table 2 it can be seen that the average practicality level of plant morphology practicum guided instruction according to students is 97.7% with a very practical category. With values that are easily interpreted the highest, which is 94% with a very practical category, this indicates that the practical guide is very interesting for students, the material and images in the practical guide help students easily carry out practical activities. The value of time required is 91.6% with a very practical category. This indicates that the use of guided inquiry-oriented plant morphology practicum guides can facilitate students in carrying out practical activities with shorter time. While the value of ease of use and equivalent have the same value, 90.4 with a very practical category. So it can be concluded that the guide for guided inquiry-oriented plant morphology is very practical and can be used.

## IV. CONCLUSION

Guidance for guided inquiry morphology practicum guide for students of IPTS biology education in Padangsidempuan belongs to the very practical category

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