

Analysis of the Need for Developing Local Potential-Oriented Modules Based on PjBL in Botany Higher Plant Courses

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ANALYSIS OF THE NEED FOR DEVELOPING LOCAL POTENTIAL-ORIENTED MODULES BASED ON PJBL IN BOTANY HIGER PLANT COURSES

Abstract: This study aims to analyze the need for developing a local potential-oriented learning module based on Project-Based Learning (PjBL) in the Higher Plant Botany course at the Biology Education Study Program of Hamzanwadi University. The research employs a qualitative descriptive method, with data collected through observations, interviews, and questionnaires. The results indicate that the learning process in the Higher Plant Botany course faces various challenges, such as the lack of learning media and students' difficulties in understanding plant morphology, particularly in using Latin terms. Additionally, the learning module is identified as the primary material desired by students to support more independent and effective learning. Based on these findings, the development of a comprehensive module that incorporates local potential is recommended to enhance the quality of learning and student engagement in studying Higher Plant Botany.

Keywords: Learning module, local potential, Project-Based Learning (PjBL), higher plant botany, needs analysis

Introduction

Botanical Tall Plants is one of the compulsory courses with a weight of 3 credits and is programmed in semester 3 for students of the Biology Education study program at Hamzanwadi University (Bio Curriculum Development Team, 2022). This course has the scope of material study consisting of plant morphology, plant anatomy, plant physiology, plant development, plant evolution, and ethnobotanical studies (the use of potentially medicinal plants). In the implementation of learning, this course uses teaching materials in the form of textbooks and internet resources as well as power points provided by lecturers. Generally, the textbooks used are separate textbooks according to the study of the material, so students must have all books in accordance with the course study materials to be able to follow the course well. In addition, in the explanation of the subject of study in the form of certain plants, often these plants are difficult to find in the surrounding environment so that the implementation of contextual learning cannot be done optimally.

Therefore, lecturer creativity is needed to be able to facilitate learning optimally by providing comprehensive teaching materials and in accordance with student needs. Teaching materials or learning resources are the main things that must be pursued by learning organizers, in this case lecturers as course supervisors, because the learning resources used in universities are the main thing, in order to improve the quality of learners' independent learning (Muga *et al.*, 2017). One of the teaching materials that can be developed by educators is modules. Modules are one of the teaching materials in the form of prints (Hamdani 2011: 219).

Modules can be used independently according to the characteristics of learners. With the module, it provides opportunities for students to learn independently, test the ability of students by doing the exercises presented, reduce dependence on textbooks, and students have the opportunity to express ways of learning that are in accordance with their abilities and interests (Hamdani, 2011: 220). However, before developing the teaching media, it would be nice to analyze the need for development so that the teaching media developed is right on target, besides that the teaching materials developed can be expected to be developed electronically so as to encourage the realization of effective and independent learning activities (Hobbs, 2006; Wilson, 2018).

The purpose of this study is to determine the need for the development of teaching materials in the form of modules to be developed for the high plant botany course according to the characteristics of the course, and the needs of students. The results of this research will be used as a basis or reference in the development of high plant botany modules oriented to local potential based on PjBL. Local potentials such as biodiversity, culture, and natural resources in an area can be used as a basis for the development

of relevant and interesting learning modules. By integrating these aspects into the curriculum, students can gain a deeper understanding of their environment and the importance of taking care of it. This is expected to spark curiosity and ownership of their local environment, which in turn can increase caring attitudes towards environmental issues more broadly (Jones *et al.*, 2021).

The Project Based Learning (PjBL) learning model is a learning approach that provides opportunities for students to learn through real-world problem-based projects or assignments. Some relevant theoretical studies on PjBL can provide a deep understanding of this learning model. (Wahyudi *et al.*, 2021) explained that PjBL uses real-world problems as a learning context that allows students to develop critical thinking skills, work collaboratively, and manage time to complete projects. Daniel (2017) emphasizes that PjBL gives students the freedom to plan learning activities, carry out projects collaboratively, and produce work products that can be presented to others. (Mamahit *et al.*, 2020) highlight that the PjBL-STEM model encourages students to learn actively, in groups, and share information, thus helping in broadening students' horizons in thinking.

Method

This research is a qualitative descriptive research. Fadli (2021) stated that the purpose of qualitative descriptive research is to understand the context with the situation and setting of natural phenomena according to what is being studied. This research will be carried out from April to May 2024. This research was conducted at the Biology Education study program of Hamzanwadi University on Jalan TGKH Muahammad Zainuddin Abdul Madjid No. 132 Pancor Selong East Lombok.

The research subjects consisted of 45 students and 2 lecturers who taught the botanical high plant course. Data collection techniques are carried out through interviews with lecturers, observation activities carried out when lecturers teach high plant botany courses, and through the distribution of questionnaires to students to find out what obstacles are experienced by students and student needs in lectures in high plant botany courses. The data collection instrument uses 1) questionnaires of student needs, 2) observation sheets of the learning process of the high plant botany course, and 3) interview guidelines with lecturers of the high plant botany course. Data analysis techniques for this study used qualitative descriptive analysis techniques (Williams & Moser, 2019).

Result and Discussion

Result

This study aims to conduct a needs analysis for the development of high plant botany modules by referring to problems and learning needs. Data collection is carried out through observation, interviews and questionnaires. The results of data analysis in each data collection activity are presented as follows.

1. Data Analysis of Observations of Higher Plant Botany Learning

Observation activities are carried out during the teaching and learning process in class. Observation activities focus on indicators: 1) conformity of learning implementation with RPS; 2) conformity of the material with CPMK; 3) learning strategies/methods used; 4) the learning media used; and 5) findings of student problems or obstacles during learning. The results of learning observations are shown in Table 1 below.

Table 1: Learning observation results

Indicators	Observations
Compatibility of learning implementation with RPS	Lecturers teach in accordance with learning RPS
Compatibility of the material with CPMK	Lecture materials are in accordance with the achievements of the course
Learning strategies / methods	Strategies / Learning methods used group discussions, presentations and question and answer discussions
Teaching materials	The teaching materials used are in the form of power points
Learning media	There is no use of learning media
Climate of defense	Learning was quite active, some students actively discussed, but there were still some students who were not active during the discussion process.
Findings of student problems / obstacles during learning	Students seem to have difficulty in describing the morphological characteristics of plants, especially Latin terms, and the plants used as samples are not plants that are always around students

Based on Table 1 above, the entire learning runs in accordance with RPS with material in accordance with CPMK. However, learning strategies or methods have not been enough to optimize students' abilities. In addition, the teaching materials used are only in the form of power points without the use of learning media. So that this affects the learning climate, namely only a few students who are active during lectures. Some obstacles or problems of students during the learning process are that students seem to have difficulty in describing the morphological characteristics of plants, especially in terms of mentioning the Latin term plant. In addition, the selection of plant samples to be described is not a plant that is easily found around students.

2. Data Analysis of the Results of Filling out Questionnaires by Students

The activity of filling out the needs analysis questionnaire was carried out by 45 students of the Biology Education study program at Hamzanwadi Selong University. Indicators of questionnaire instruments consist of: 1) learning resources used with internet options, textbooks, hand-outs; 2) difficulty in learning the botany of tall plants with the choice of difficulty in memorizing Latin names and Latin terms, a lot of material, and using many source books; and 3) teaching materials desired by students with a choice of textbooks, modules, hand-outs, and practicum instructions. Filling out the questionnaire is done by checking according to the student's choice, and students can choose more than one choice. The results of the analysis of the needs questionnaire by 45 students are shown in Table 2 below.

Table 2: Results of needs analysis using questionnaires by students

Indicators	Yield (%)
Learning resources used	
Internet	100
Textbooks	33,33
Hand out	15,56
Difficulties in learning the botany of tall plants	
Memorize Latin names and other Latin terms	100
Lots of material	100
Use multiple sourcebooks	100
Desired teaching materials	
Textbooks	22,22
Module	88,89
Handouts	44,44
Practicum instructions	55,56

Based on Table 2 above, the highest percentage of learning resources used is the internet, which is 100%, meaning that all students use the internet as a learning resource, then as many as 33.33% or only 15 students use textbooks, and 15.56% or 7 students use hand-outs given by lecturers as learning resources. Furthermore, on the indicator of students' difficulty in learning high plant botany, all students experience the same difficulties, namely difficulties in memorizing Latin names and Latin terms, a lot of material, and using many source books. In the indicators of teaching materials desired or needed by students, the highest percentage is modules, which is 88.89% or as many as 40 students need modules, then practicum instructions of 55.56% or as many as 25 students need practicum instructions, 44.44% or as many as 20 students need hand-outs, and 22.22% or as many as 10 students need textbooks as teaching materials.

3. Data Analysis of Interview Results of Lecturers Teaching Tall Plant Botany Course

Interviews were conducted with two lecturers who taught the high plant botany course. The indicators formulated in the interview instrument include lecturers' understanding of local potential, lecturers' experience in utilizing local potential in learning high plant botany, lecturers' understanding of the PjBL learning model, lecturers' experiences in implementing learning using the PjBL model, learning resources used by lecturers to compile study materials, teaching materials used, obstacles or problems faced during the implementation of plant botany learning height, teaching materials needed by lecturers, and lecturers' understanding related to modules. The results of interviews with two lecturers can be seen in Table 3 below.

Table 3: Results of interviews with lecturers of tall plant botany course

Indicators	Interview Results
Lecturers' understanding of local potential	Use of local potential as a learning resource
Utilization of local potential in learning	Usually done during practicum only, according to the theme or material
Lecturers' understanding of the PjBL model	Project-based learning
Implementation of learning with the PjBL model	Usually carried out on herbarium making activities
Learning resources	Internet, primary books such as plant taxonomy, plant anatomy and plant ecology and plant development books
Teaching materials used	Power point
Obstacles in the implementation of learning	The most frequent is related to the availability of teaching materials,
The need for teaching materials	Comprehensive teaching materials are needed, namely teaching materials in which it covers all study materials in the high plant botany course, and is equipped with field practicum instructions
Lecturers' understanding of modules	Modules are a collection of materials and assignments, teaching materials that can support independent learning

Based on Table 3 above, the indicators of lecturers' understanding of local potential, PjBl learning models, and modules are almost the same, namely local potential is used as a learning resource, PjBl is project-based learning, and modules are a collection of materials and tasks for independent learning needs. Furthermore, the utilization of local potential is usually carried out during practicum or on certain themes. Likewise, the implementation of learning with PjBl is only carried out on the theme of making herbariums. Learning resources used for reference in compiling study materials are the Internet, primary books such as plant taxonomy books, plant anatomy and plant ecology and plant development. However, the teaching materials prepared are only in the form of power points. The obstacle or problem found by lecturers in carrying out learning is the availability of teaching materials. So that the teaching material indicators needed by lecturers are comprehensive teaching materials, namely teaching materials in which they already cover the entire study material in the high plant botany course, and are equipped with field practicum instructions.

Discussion

Based on the results of data analysis from observations, interviews and questionnaires for student needs, overall the implementation of learning high plant botany requires more specific and comprehensive teaching materials so that it can support learning.

The results of observations of learning the botany of tall plants carried out in class, there are several findings that need attention. Although the overall learning runs according to the Semester Learning Plan (RPS) and the material is in accordance with the Course Learning Outcomes (CPMK), there are several aspects that need to be improved. The learning strategies/methods used such as group discussions, presentations, and question and answer discussions are not enough to optimize students' abilities. In addition, the use of teaching materials that are only in the form of power points without the use of learning media also affects the learning climate, where only some students actively participate. The findings of student problems during learning also include difficulties in describing the morphological characteristics of plants, especially in terms of Latin terms, as well as the selection of plant samples that are not in accordance with the environment around students.

To increase the effectiveness of learning the botany of tall plants, several corrective measures can be considered. One of them is utilizing learning media, as suggested by (Nuraeni *et al.*, 2022) in the development of interactive teaching materials. The use of interactive learning media can help increase student engagement and enrich learning methods. In addition, Liunokas & Billik (2021) showed that the development of textbooks on plant morphological characteristics can effectively improve students' ability to identify plant species. This can be a reference in compiling learning materials that are more in line with student needs.

In addition, the application of learning models that emphasize more on active student involvement, such as Problem Based Learning (PBL) as suggested by (Mandagi *et al.*, 2021), can help improve students' critical thinking skills and learning outcomes. This learning model has been proven effective in increasing the critical thinking level of learners. In addition, the use of the environment as a learning resource, as researched by (Nurbaya *et al.*, 2022), can also improve student learning outcomes in science subjects.

The results of the analysis of filling out the needs questionnaire by students of the Biology Education study program at Hamzanwadi Selong University, there are interesting findings. From the table presented, it can be seen that all students use the internet as the main learning resource, while the use of textbooks and handouts is still underutilized. This is in line with the research of (Meke *et al.*, 2021) which highlights the importance of independent and versatile higher education learning programs, such as Merdeka Belajar Kampus Merdeka (MBKM), which can better meet student needs.

In addition, the difficulties faced by students in learning the botany of tall plants, such as memorizing Latin names and Latin terms, a lot of material, and the use of many source books, are also a concern. Noviati's (2020) research on the difficulties of online learning of students in the midst of the Covid-19 pandemic can provide additional insights regarding the challenges faced by students in the distance learning process.

In terms of teaching materials desired by students, it can be seen that modules are the main choice, followed by practicum instructions, handouts, and textbooks. References Afifulloh & Cahyanto (2021) which discusses the analysis of the need for developing electronic teaching materials in the era of the Covid-19 pandemic can provide guidance in compiling teaching materials that suit student needs.

The results of interviews with two lecturers of the High Plant Botany course, there are several findings that need attention. From the table presented, it can be seen that lecturers' understanding of local potential, PjBL learning models, and modules have similarities in the use of local potential as learning resources, PjBL as project-based learning, and modules as a collection of materials and tasks for

independent learning. This reflects lecturers' awareness of the importance of utilizing local potential in learning and the use of project-focused learning models to increase student engagement.

The utilization of local potential in learning the botany of tall plants which is usually carried out during practicum or on certain themes shows an effort to link theory with practice concretely. This is in line with research conducted by Suryanto (Suryanto *et al.*, 2021) which highlights the importance of direct practical experience in learning botany to increase students' understanding of the material. However, there are obstacles faced by lecturers related to the availability of teaching materials, where the teaching materials prepared are only in the form of power points. This shows the need for the development of more comprehensive and structured teaching materials, as suggested by Nurhayati and Wijayanti in their research on the development of module-based teaching materials to improve student learning outcomes (Nurhayati and Wijayanti, 2022).

In this context, lecturers' understanding of modules as teaching materials that can support independent learning is important. References from (Kusumawati *et al.*, 2021) which discuss the effectiveness of using modules in botany learning can provide guidance in preparing modules that suit the needs of lecturers and students. Thus, to improve the effectiveness of learning botanical of tall plants, it is recommended that lecturers can develop more comprehensive teaching materials, expand the use of modules as learning resources, and continue to utilize local potential in learning to provide a more meaningful learning experience for students.

Conclusion

Based on the results of data analysis from observations, interviews, and filling out questionnaires for student needs, there are several important findings that show the need for the development of more specific and comprehensive teaching materials to support the learning of botanical plants of tall plants.

Although overall learning runs in accordance with the Semester Learning Plan (RPS) and the material delivered is in accordance with the Course Learning Outcomes (CPMK), there are several aspects that require improvement. The strategies and learning methods used such as group discussions, presentations, and question and answer discussions have not been enough to optimize students' abilities. The use of teaching materials that are only PowerPoint presentations without the use of other learning media also affects the learning climate, with only some students actively participating. In addition, students face difficulties in describing the morphological features of plants, especially in the use of Latin terms, and the selection of plant samples that are not suitable for their surroundings.

To improve the effectiveness of learning the botany of tall plants, several corrective steps that can be considered include:

- a) Utilization of Interactive Learning Media
- b) Learning Module Development
- c) Active Learning Model
- d) Utilization of Local Potential
- e) Maximizing PjBL learning
- f) The use of learning resources is diverse.

Overall, to improve the effectiveness of learning botanical of tall plants, it is recommended that lecturers develop more comprehensive teaching materials, expand the use of modules as learning resources, and

continue to utilize local potential in learning. With these steps, it is expected to provide a more meaningful learning experience and increase students' understanding of high plant botanical material.

Suggestion

The suggestion from this research is for lecturers to develop more comprehensive teaching materials, expand the use of modules as teaching materials, and continue to utilize local potential in learning. With these steps, it is expected to provide a more meaningful learning experience and increase students' understanding of botanical material of tall plants.

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