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1 Design of Discovery Learning Model Biodiversity Integrated to Develop the Scientific Attitude of Student

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Abstract. In learning Biology with a scientific approach, the scientific attitude becomes important to be developed in students, the problem is not all teachers have the creativity and innovation to develop the scientific attitude. In this study, stages will be carried out to design a scientific approach to discretion for the subject of integrated ethnobotany biodiversity and religious value. The *Ethnobotany* Study is interesting because this study discusses the biodiversity of local plant species, the names of these plants in local terms, scientific names, benefits for life, as well as including their classification in Plant taxonomies. This type of research is a qualitative descriptive research. In this study, the research team conducted observations, interviews with officers and resource persons at Perhutani Jambi with address: Jln Lintas Jambi-Palembang, Kenali Asam Bawah, Kota Baru, Jambi, KM 11, Jambi. Data obtained related to the type of local plants are carried out verification and data reduction, and integrating local plant knowledge in the context of ethnobotany in the subject of Biodiversity in Biology. The results of the study found five main local plants in tropical forests, namely (1) Jatropha (*Ricinus communis*), (2) Bulian (*Eusideroxylon zwageri*), (3) Meranti Bunga (*Shorea leprosula* Miq), (4) Meranti Putih (*Shore spp*) (5) Jengkol (*Archidendron pauciflorum*) (6) Gaharu (*Aquilaria malaccensis*), (7) Ketapang (*Terminalia cattapa*) In this study it was also found that local plants as *ethnobotany* were cultivated mostly for blandar wood (beam), Usuk, and house sills, because they were resistant to termites, namely Bulian, Meranti Bunga, Meranti Putih plants, Gaharu type plants for deodorant can be taken, other types of productive plants found fruit, and ornamental plants for parks or protectors to be planted on the roadside. In its application, the information obtained from these types of plants and their benefits are packaged in the study of Biodiversity in Biological Materials. The design of teaching materials, the teacher assigns assignments to students for observation, interviews, analyzing data, and presenting their findings in the Perhutani Tropical Forest to increase the scientific attitude of students. And assigns assignments to discovers sens of religious value at The Holy Alquran related to religious values on biodiversity material.

Keyword: Discovery Learning, biodiversity, ethnobotany, scientific attitude

1. Introduction

In Biology learning with a scientific approach, student learning becomes important to be developed in students. The problem is not all teachers have the creativity and innovation to develop scientific attitudes. In this research, the stages of designing a scientific approach to discovers learning will be carried out for the subject of ethnobotany integrated biodiversity in an effort to develop students'



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scientific attitudes. This research is interested in the study of ethnobotany, because this ethnobotany study discusses the botanical aspects in the study of cultural aspects, especially the biodiversity of local plant species in Perhutani Jambi. Ethnobotani that will be the object of research are the names of plants in local terms, scientific names, benefits for life, classification in plant taxonomy, and cultivation aspects.

In this study the location of the research related to tropical forests in Perhutani Jambi, because Indonesia is known as a country with a tropical climate, so it is rich in local plant species that live and spread around the forest area and known as the biodiversity of tropical forests. The results of the analysis of some literature and literature found that the specific biodiversity of wood plants in Tropical Forests in Indonesia has several types of wood plants that can be utilized by humans as a source of Nation culture (2013). While exploration is related to community knowledge about the use of local biodiversity for the community and scientific knowledge, including the field of ethnobotany studies [7]. In the results of research from [5]: it is known several types of Indonesian tropical forest wood plants that are widely used for various human interests, including [1] Distance / Wheels, [2] Meranti, [3] Ketapang, [4] Bulian, and [5] Meranti. *Jatropha* in its growth can reach 10 meters high, poisonous white gummy, known as shade trees, ornamental, medicinal and as building material for houses, furniture (cupboards, couches, chairs and tables),

At this time a learning that integrates cultural aspects in science learning has not been developed in MAN Insan Scholar Jambi, especially related to ethnobotany which can be part of Biology Materials. Therefore this study will present a conceptual design related to the design of a Biology Material Discovers Learning Model integrated by religious value for Developing the Scientific Attitudes of MAN Insan Scholar Jambi Students. Learning is covered, meaning in its application the students through the guidance of the teacher to find some information on the types of tropical forest plants, local names, scientific, benefits, description of its characteristics, as well as its cultivation. Thus in this learning the students developed a scientific attitude of curiosity, critical, creative, communicative, cooperative, and religious. At the moment, Perhutani Jambi Loakasi has not been maximized as a tourism edu, whereas in terms of its location, this location is very strategic and useful for introducing local biodiversity that grows in tropical forests and as a source of learning cultural values.

2. Methods

This study is using a qualitative descriptive method for biodiversity analysis for learning sources of community cultural values (ethnobotany) by applying the Discovery Learning Model (Diskoveri Learning). Research subjects and research focus are the Pal XI Identity Forest Park Area (THK) Jambi, employees and Perhutani experts. Researchers used data collection techniques with active participation observation, in-depth interviews, with resource persons, field observations, documentation studies, literature literacy studies on biodiversity, ethnobotany and sources of cultural value of biodiversity.

At the beginning of this study, an analysis activity was carried out, then the design for the Ethnobotany integrated discourse model approach. In this study, researchers conducted observations, interviews with informants, and documentation of research objects. Interviews with resource persons focused on community knowledge, in this case employees about the ethnobotany knowledge of tropical forest plants in Perhutani Jambi, the cultivation of ethnobotany plants in the Taman Hutan Kenali. During the interview, the identity of the source is carefully recorded. Socio-cultural studies of biodiversity values are collected and verified, data that do not contain ethnobotany values are reduced and then validated by scientific experts and / or scientific documents. Followed by task-based learning ethnobotany science of biodiversity of tropical forests, in accordance with the value of cultural comfort and aesthetic values in accordance with social and cultural elements created by humans as a value system, the idea of belief in behavior as social beings. Communities can live orderly by recognizing the value system and norms that are adhered to by each of its members [2]. The values of cultural comfort, aesthetics, spiritual, medical, and scientific knowledge are explained in The Holy

Quran at Surah Alfathir : 27-28, An-nahl: 65, Yusuf: 43-48, Al-An'am: 99. In accordance with Zarima dan Vebrianto (2017) research on the integration of scientific knowledge and islam in the learning process of the IPA family (18).

3. Research Results and Discussion

3.1 Exploration Results of Tropical Plants in the Etbotani Context

Table 3.1 presents the results of observations of types of tropical forest plants in Perhutani Jambi, interviews with resource persons, and their descriptions in the Ethnobotany context.

Table 1. Description of Tropical Forest Types in Ethnobotany Contexts and their Benefits

No	Local Name	Scientific name (Latin)	Description of scientific knowledge	Location of tropical forest plant distributio	Cultural Values and Their Benefits for the Community
1.	Jarak	<i>Ricinus communis</i>	Thorny stems, jagged leaves, heart-shaped	Amerika, Asia and Indonesia	Timber, shade, medicine, furniture.
2.	Bulian, Ulin	<i>Eusideroxylon zwageri</i>	Stems are straight, the epidermis is easy to erode, the leaves are oblong with leaf pinnate bones	Kalimantan and Jambi	Beams, furniture, electric poles, shipping.
3.	Meranti Bunga	<i>Shorea leprosula</i> Miq	Stems are straight, oval leaves, gray and copper on the underside of the leaf	Thailand, Malaysia, Sumatra and Kalimantan	Building materials, beams, furniture, accessories
4.	Meranti Putih	<i>Shorea johoriensis</i> Foxw	Stems are straight, oval leaves, reddish in color	Thailand, Malaysia, Sumatra and Kalimantan	Building materials, beams, furniture, accessories
5.	Gaharu	<i>Aquilaria malaccensis</i>	Stems are straight, small leaves are pointed	Native to Indonesia	Building materials, accessories, furniture, beams.
6.	Ketapang	<i>Terminalia cattapa</i> L	Horizontal height, wide leaves uphold	Southeast Asia Region	Shade, garden shade, antioxidant compounds
7.	Jengkol	<i>Archidendron pauciflorum</i>	Shrubs, and spread branches of trees	Southeast Asia	Fruit and Vegetable

In this research observations and interviews were conducted with respondents found in the THK Pal XI Kota Baru Jambi area. Namely Mr Bambang Rosidi, age 55 years and Mr Kiran age 42 The results of the interview are that the people have been there since humans on earth have been cultivating the use of tropical woody plants for the purposes of building houses, furniture, and others according to the needs of human life. Resource persons' knowledge is gained through inheritance [1] and is deepened during the working period and through forestry and ethnobotany studies. The amount of local tropical wood has begun to decrease considerably because of the use and fulfillment of human needs whose numbers continue to grow more rapidly. But not accompanied by the cultivation of these plants properly. Therefore it is necessary to conserve in situ and ex situ [12] so that biodiversity is not extinct [10]. In this study the results of the guided interviews are presented in Table 3.2.

Table 2. Focus of Ethnobotany Research Questions

No	Focus Questions and Answers Resource (Indigenous Science)	Scientific Knowledge Category and Ethnobotany aspects
1	Question: Where did you get the knowledge of the benefits of local plants?	Procedural knowledge about the benefits of local plants

	Answer: hereditary knowledge, self-taught and from forestry training	
2.	Question: What local wood is of cultural value? Answer: Bulian, meranti putih, meranti bunga, aloes, distance, ketapang, jengkol.	Useful wood parts, liquid, leaves, fruit
3.	Question: How much can be used from each local tree? Answer: a lot but has begun to step up and lack of production	Taking the utilization of plants based on the size and volume of the tree trunk, age and purpose of its use.
4.	Question: What is the process for using local wood? Answer: The process is through logging, making blocks, in soumil, and so on according to the needs and requests of users.	The focus of the question is on the technical aspects of using local wood
5.	Question: What about wood waste? Answer: wood waste does not harm the environment, it can be used as firewood, the powder can be used as hydroponic material.	In this section focus on the character of caring for the environment.

Furthermore, data analysis and information from the interviews are then analyzed and synthesized [14]. Fermented with textbook literature, scientific articles and expert information. The results of the analysis are presented in table 1. Through scientific explanations by experts, and all sources of information it can be concluded that scientific knowledge obtained by students is conceptually correct. The answers from the speakers were analyzed and found a combination of indigenous knowledge with scientific knowledge succeeded in increasing understanding of the concepts of science, technology, critical thinking, objective, logical and creative even giving meaning to deep learning obtained from documents related to the benefits and role of biodiversity of local tropical plants from in terms of ethnobotany [15]. The document is presented in Figure 3.1.



Figure 1. Photo Types of tropical forest plants in Perhutani Jambi, namely (1) Bulian seedlings, (2) Bulian trees, (3) Ketapang seedlings, (4) Gaharu, (5) Meranti Putih, (6) permanent nursery sites.

In this research, all documents and observational data, interviews with Botany experts and Perhutani employees of the Forest Park Recognize Pal XI were analyzed according to the scientific approach to Discovery Learning. From the research results obtained information that the biodiversity of local tropical forests has been well utilized and carried out conservation by nurseries and tropical forest plants are well managed and programmed [10] Being a source of learning, research, conservation and aesthetics for the world of education and local communities [6]. Valuable ethnobotany learning resources, as well as sources of spiritual importance [10]. Data on the utilization of tropical forest plants by the community as a result of human cultivation as a source of medicines [3]. The resource person has a correct understanding of tropical forest plants and applies knowledge correctly in the Ethnobotany context.

3.2 Design Discovery Learning of Biodiversity Integrated Ethnobotany to Develop Scientific Attitudes

¹ In this research in designing a learning cover for Ethnobotany Integrated Biodiversity material to Develop Scientific Attitudes, analysis, design, development, implementation, and evaluation activities are carried out. At the analysis stage, a study was conducted on the 2013 curriculum syllabus biology analysis document, learning plan documents for biodiversity material, models and ongoing learning strategies. The results of the analysis carried out design activities of the learning tool which emphasizes learning recovery which includes observation activities in the Tropical Plantation Forest in Perhutani Jambi to find information related to the types and names of tropical forest plants, the morphological description of each local plant, the benefits of plants, how to cultivate plants, and aspects of the origin of the plant. In this study the scientific attitude of students is taken and measured at the time, students make observations that are assessed scientific attitudes related to curiosity, critical attitude, independence, responsibility, and assessment at the time of presentation of the results of observation. The results of the measurement of scientific attitudes are analyzed descriptively qualitatively; so as to produce a scientific attitude profile of the student. In this study, the subjects of the research were MAN Insan Cendekia Jambi students.

4. Conclusion

The results of research and discussion are learning biodiversity with a scientific approach integrated with ethnobotany diskoveri is very positive towards increasing understanding of the role of biodiversity, the role of biodiversity as economic, medical, aesthetic, cultural, spiritual, food, scientific values and forming students' scientific attitudes through special experience Observation and observation of tropical forest plants in the Taman Kenali Pal XI Jambi park.

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