The importance of teaching materials based local potential mangrove ecosystems: introduction study

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Abstract. Local potency-based learning provides knowledge, skills, understanding of the state of the environment and the needs of local communities in accordance with the values or rules that apply to learners. This study was an introduction study on the use of local potency-based teaching materials by SMK N 1 Legonkulon Fisheries adjacent to damaged mangrove forests. The method used in this research was descriptive-qualitative method. Preliminary data regarding the importance of application of teaching materials were explored through interview instruments for teachers and students. The subjects were 2 teachers and 15 students from SMK N 1 Legonkulon. The results showed that 100% of students did not study the mangrove ecosystem in learning and did not know about the relation of mangrove existence to the fish population. Teachers claimed only teach the ecosystem in general and did not convey the subject matter about the mangrove ecosystem due to not having the teaching materials associated with the mangrove ecosystem. Based on preliminary study it was deemed necessary to apply local potential-based teaching materials so that students better understand and care about the environment, and better understand the concept of ecosystems to gain useful learning.

1. Introduction
One of the causes of environmental damage that occurs nowadays comes from human exploitation towards natural resources. Reciprocal relationships between people and the environment can be seen in community activities in managing their environment. By having the ecological insights, all individuals can improve the way they behave towards the environment so that the current environmental crisis can be reduced [1]. Subang Regency is one of the districts located in the North Coast of West Java, Indonesia, that experienced coastline retreat. The utilization of coastal areas into ponds by changing the mangrove area into open land causes the damage to coastal environments such as abrasion, accretion and sea water intrusion [2]. Pondok Bali Beach is one of the beaches that experienced coastline retreat in Subang Regency. It can be seen from the reality that local people have converted the mangrove forest into shrimp ponds, and also cut down mangrove trees for their daily needs.

Human is the one who is responsible to take care of the environment, but when the crisis happens, it might affect his/her spiritual and moral. As a result, they might become both the destroyers and also the guardians of the environment depending on the values they embrace. Moreover, the human crisis can also lead to environmental crisis with all its components [3]. Science education is expected to be a vehicle for learners to learn about the nature and its prospects for further development in applying it in everyday life. The learning process emphasizes the provision of hands-on experience to develop competencies to explore and understand the nearest environment and the nature scientifically [4].

School is a very strategic place to plant the value and knowledge to students. The right teaching and learning process can lead to a change of attitude and develop students’ ecological knowledge towards the environment. Thus, it can create human resources who can wisely exploit their self-potential in creating a conducive ecological environment. Science education is aimed to do research and take actions so that it can help students to gain a deeper understanding of the natural world and its phenomenon [1]. To reach the goal of science education, it is needed what is called as learning program. It is defined as a series of scenarios about what to learn and how to learn it. The learning program has been planned by taking into account the condition of the school especially the physical condition, including the utilization
of the local potential of the school such as the environmental around of the school that can support the Biology learning, with instructions and monitoring by the teacher [5].

Teaching materials is one of the components that exists in the learning program. They have an essential role in achieving the expected learning objectives. They are defined as information, tools and texts needed by teachers or instructors for planning and reviewing learning implementation [6]. Instilling teaching materials based on local wisdom can be very useful for education. As local wisdom-based education might provide students with knowledge, skills and behavior so that they have a solid insight about their environment and the needs of their community in accordance with the values or rules prevailing in their area by supporting regional development and national development [7].

Environmental issues that occur around SMKN 1 Legonkulon demands students to be able to think creatively in solving problems that occur around them. Creativity-Based Science learning emphasizes on facilitating students to generate new ideas that are effective and ethical (having meaning and value). Pondok Bali’s natural resources can be a source for students’ learning to recognize and understand their environment. Teaching materials based on local potential by explaining the condition of mangrove ecosystem in Pondok Bali can stimulate students to think creatively in solving a problem.

2. Method

This research was conducted at SMK N 1 Legonkulon. The execution time is done in academic year 2017/2018. The method used in this research is descriptive-qualitative method. The subjects were 15 students and 2 teachers from SMK N 1 Legonkulon. The instruments used in this research are: 1) questionnaire in the form of question about the relation of mangrove ecosystem with fishery, and the use of biological teaching materials related to mangrove ecosystem filled by students; 2) interview format of biology teacher related to teaching materials of mangrove ecosystem. The steps in this study include: 1) asking students to fill in the questionnaire provided. 2) interviewing teachers and recording interview results. Stages of data processing conducted among others: 1) perform the initial knowledge analysis of students through instruments that have been filled by students; 2) analyzing the results of interviews with teachers; 3) Transformation of data into percent in the form of diagrams; 4) discuss the results of data analysis and take conclusions from the results of data analysis has been done.

3. Result and Discussion

Based on the result of interview and data analysis, 100% of students do not have handbook of mangrove ecosystem, do not study the relation of mangrove ecosystem with fishery and do not know relation of mangrove ecosystem and fish population number (Figure 1).
Figure 1. Graph of result of data analysis result of research changed to percent.

Figure 1 is a graph of data analysis result. Graph 1 describes the number of students who have a handbook on fisheries there are 67%, students who have books about 0% mangrove ecosystem, and students who do not have 33% handbook. Graph 2 describes students studying the relationship of mangrove ecosystem and fishery 0% and students who did not study the association of mangrove ecosystem and fishery 100%. Graph 3 describes the number of students who know the relationship of mangrove ecosystem with 0% fishery and students who do not know the relationship of mangrove ecosystem with fish population 100%. 99% of students of SMK N 1 Legonkulon are local residents of Legonkulon who live close to the damaged Pondok Bali mangrove forests. Students as the next generation of local residents do not know and understand the role of mangrove ecosystem.

Lack of student understanding as local residents about their surrounding environmental ecosystems can exacerbate environmental damage. The errors of human resource exploration are the cause of the current environmental damage. Reciprocal relationships between people and the environment can be seen in community activities in managing the surrounding environment. With the ecological insights of each individual can improve how humans behave towards the environment, so the current environmental crisis can be reduced [1].

Teaching materials is one alternative that can provide understanding to students to understand the environment. Local potential can be a learning medium of students who poured into teaching materials so that students can understand the content of the subject matter easily and the learning process becomes meaningful. In the world of education materials made local wisdom is very important and inseparable. Local wisdom-based education provides students with knowledge, skills and behavior so that they have
a solid insight into the state of the environment and the needs of the community [7]. Students respond positively to science-based learning of local excellence. There are significant differences in student learning activity and significant critical thinking skills between classes that apply science-based learning to local excellence with classes that do not apply science-based learning to local excellence [8].

The results of interviews with biology teachers stated: 1) lack of a handbook on mangrove and fishery ecosystems; 2) the teacher also stated that it is important to have a handbook of mangrove ecosystem in supporting the smoothness of the learning process. Limitations of teachers in having teaching materials can be one of the effects of student’s lack of understanding of the condition of the surrounding environment. The absence of teaching materials that raise the local potential in learning will make teachers difficult to apply in the learning process. Educators or teachers can internalize the local potential in biology learning as one of the tools in presenting biological material that is appropriate to everyday life. The use of teaching materials based on local wisdom in learning will be more contextual because local wisdom is located around the students. Thus, using teaching materials based on local wisdom to make learning will run effectively and students follow learning with pleasure [9].

The diversity of Natural Resources, Human Resources (HR), geography, history, and culture of each region are the nation’s development assets. Today, such diversity can be a superior competitive aspect (local advantage). Examples of local advantages include: biodiversity, community culture, quality of human resources, value of cooperation, tolerance, cleanliness, local wisdom in protecting the environment, and other local values that are universal. One effort that can be done is to introduce further local advantages to learners as early as possible. Thus, efforts to integrate the content of the value of local excellence into the education path needs to be done [10].

4. Conclusion
Based on the results of this study it can be concluded that it is important to apply the local potential based teaching materials. Potential local-based teaching materials can provide knowledgeable supplies, skills and instill environmental caring behavior to learners. The role of local potency-based teaching materials helps students to have an understanding of the state of the environment and the needs of local communities in accordance with the values or rules that apply. Students understanding of the environment can reduce the human knowledge crisis on the environment, thereby preventing ever-increasing environmental damage.

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