Analysis of Ecoliteracy Based Science Learning Resources Needs to Realize SDGs

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Abstract

Analysis of Ecoliteracy Based Science Learning Resources Needs to Realize SDGs. *This research aimed to describe needs of students' Science learning resources with ecoliteracy at PGSD STKIP Al Hikmah Surabaya. Students, the majority of whom are young, have great potential to realize a more environmentally friendly Indonesia as stated in the Sustainable Development Goals. Research method that is used in this research was qualitative. Data collected by using questionnaires and interviews. Data analyzed descriptively. Research revealed that PGSD students have middle ecoliteracy . Science learning resource that is needed for students was the Science Education Book with Ecoliteracy. Through the development of Ecoliteracy -based Science Education Books, it is hoped that PGSD students will be able to become students who understand and are aware of environmental issues (ecoliterate), and can design learning activities for elementary students that can instill environmental care characters. The book consisted of information about ecoliteracy and teaching and learning in elementary school for enhancing students' ecoliteracy. The book was also completed with youtube, instagram, and journal links as an additional information.*

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INTRODUCTION

The current environmental problems are increasingly felt in human life. The temperature of the earth is getting hotter, the disaster is more common, and the clean water crisis occurs in some areas. Based on data from the Ministry of Environment and Forestry in 2020, national environmental issues in Indonesia are dominated by waste problems, water resources which include the quality and quantity of water, as well as land environment issues. This data was strengthened by data from the Central Statistics Agency in 2021 concerning the limitations of fossil energy and the development of renewable energy resources that were still not significant.

Pandemic Covid-19 that hit the whole world, including Indonesia, adds to the list of environmental issues. Reporting from CNN Indonesia, 9.2 million tons of plastic waste such as masks and gloves found in 193 countries from the beginning of Pandemi until mid-August 2021. These garbage can damage the underwater ecosystem and if not managed also impact on human health. This problem is not only the responsibility of the government but also a shared responsibility, especially educational institutions.

Campus is an educational institution that has a big hand for the resolution of environmental issues through students as agents of change. The majority of students who are

still young are great potential to create a more environmentally friendly Indonesia as in Sustainable Development Goals. One way is through courses.

Natural Environment Course at PGSD STKIP Al Hikmah Surabaya is one of the compulsory courses of Science or Natural Sciences (IPA). This course aims to equip students to master the science material in elementary school. In addition, through this course, students are also expected to become students who have good ecoliteracy, care for the environment and help achieve Sustainable Development Goals. To achieve these goals, systematic learning resources are needed in the form of textbooks.

Although, the systematic learning resources to learn Natural Science is not available in STKIP Al Hikmah Surabaya. Just some resources are separated in many books, article, or others. Students said that they need a systematic learning resource that contain Science knowledge. They also need how to teach Natural Science in elementary School.

Through the development of Ecoliteracy -based IPA education books, it is expected that PGSD students will be able to become students who understand and are aware of environmental issues (ecoliterate), and can design learning activities for elementary students who can instill the character of environmental care.

Ecoliteracy is the ability and awareness that a person has towards his environment for his survival. "Ecological literacy (or ecoliteracy) is knowledge of the basic principles of organization that ecosystem has have evolved to sustain life" (Capra, 2015). In addition to knowledge, ecoliteracy is also related to awareness to behave in protecting the environment. "Ecoliteracy Tells Us that we all belong to 'Oikos' the Earth Household (The Greek Root of the Word Ecology), and Therefor We Must Behave according to (Capra, 2015).

In line with Capra, Muthukrishnan (2019) also stated that "ecoliteracy is the ability to" read "the environment and" act "with the goal of being sustainable with all our needs. This Literacy Reaches a Critical Level when we understand the limited resources that we relay on for our comfortable. "Based on that opinion, ecoliteracy is not only about reading the situation but also about behavior.

Ecoliteracy referred to in this study is the ability and awareness of students towards their environment and their life style. This study focus on how the students aware about litter management and how their life style. The purpose of this study was to describe the needs of science learning resources based on ecoliteracy students of PGSD STKIP Al Hikmah Surabaya. This article is part of the development of Ecoliteracy -based Natural Sciences education books for PGSD students at the Define stage, the first stage in the 4D development model. Through this initial research, it is expected that the books developed according to the needs of PGSD STKIP Al Hikmah Surabaya students.

METHODS

This study uses a qualitative approach. The study was conducted on 15 students of PGSD STKIP Al Hikmah Surabaya. These students were sampled by purposive sampling method. Data were collected using questionnaires and interviews. The instruments used are questionnaire sheets and interview guidelines. Questionnaire was based on Likert scale with 5 score. The lattice of the ecoliteracy questionnaire instrument is as follows.

Table 1. Ecoliteracy Indicators

Aspect	Indicator
Knowledge	Students know about ecoliteracy
	Students know how to manage litters
	Students search about ecoliteracy and environment issues
Awareness	Students aware about their contribution to the environment

Aspect	Indicator
	Students think about the litters produced by their consumption
	Students think about the effect of their consumption to themselves and their environment
	Students use eco-friendly products

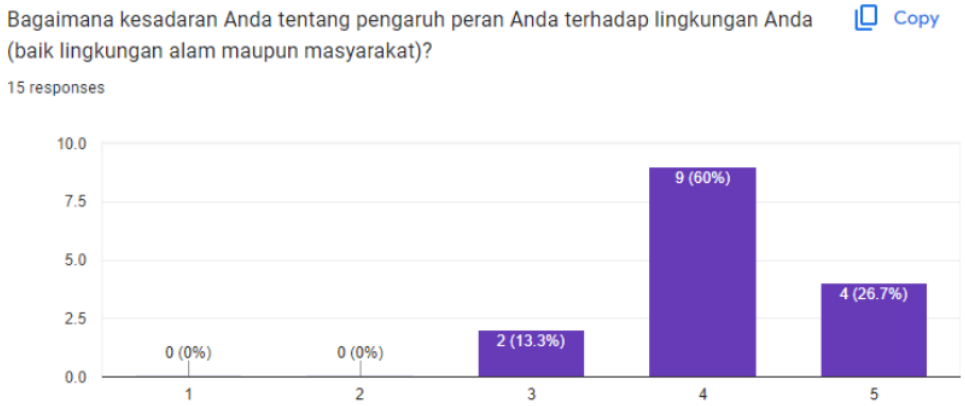
The data were analyzed descriptively with the validity of the triangulation data. The data that were collected by questionnaire were synchronized and deepen by interview. When the data was enough, it could be concluded.

RESULTS AND DISCUSSION

This study produces student ecoliteracy profile data and learning resources needed by students. The following is a description of the research results.

1. Student ecoliteracy profile

Based on the results of the questionnaire, 13.3% of students are quite aware that their role can affect the natural environment and society, while 60% of students are aware and 26.7% are very aware as seen as Picture 1 below.



Picture 1. Questionnaire Result of the First Awareness Aspect

Through in-depth interviews, 50% of students have understood that they have a big role in their natural environment. Students have understood that disposing of waste improperly can have a negative impact on the environment. Students also understand that inorganic waste cannot simply be decomposed. Campaigning through social media is a role that can be done by students because nowadays young people are very attached to gadgets and social media. Students are only limited to understanding the role that must be carried out but still not carrying it out. This result is in line with research by Gabriella & Sugiarto (2020) which suggests that students are already at a conscious stage where environmentally friendly behavior is important but its implementation is moderate, so the awareness that is depicted in students is only theoretical and not practiced. The obstacle to its implementation is the willingness of students who are still not high.

Another result in the aspect of knowledge is that 73.3% of students have thought about the processing of waste that might be generated when they consume the product, while the rest have not thought about it. However, the frequency of thinking about waste management from products consumed by students is not the same, namely 6.7% rarely, 40% quite often, 40%

often, and 13.3% always thinking. As many as 6.7% of students think enough about the impact of product consumption on their own health and the environment, while 60% think very much and 33.3% think very much. The frequency of thinking about the impact of product consumption on students' personal health and environment varies, namely 6.7% never think about it, 13.3% rarely think about it, 13.3% think enough, 33.3% think about it and 33.3% think very much.

Students already understand that if they consume the product, there must be waste generated. In deepening the interview, 87% of the students had already thought about the waste that would be produced but were less concerned about the management of the waste so that the waste was not sorted. There was 50% students do not know the types of organic and inorganic waste. This ignorance can cause students not to think about managing the waste they produce. "According to Moskaliuk et al. (2017), the cognitive aspect of a person is vital. It is because if someone does not master and understand information related to the environment and natural balance, various forms of action and decision-making that damage the environment can occur." (Salimi, Dardiri, & Sujarwo, 2021). Therefore, knowledge about the types of waste, waste management, and the impact of waste that is not managed properly must be understood by students.

In the behavioral aspect, 20% of students always buy environmentally friendly products, while the rest are in the category of infrequent, quite often, and often. In in-depth interviews, most of the students still buy environmentally friendly products on certain items, some even never use them. Another behavior is that students use existing equipment without buying new ones. This behavior is one of the sub-aspects of ecoliteracy competence according to Stone (2010), namely "turn convictions into practical and effective action, and apply ecological knowledge to the practice of ecological design."

As many as 70% of students stated that they had good ecoliteracy, while the others did not. In deepening interviews, students have confidence that they already have good ecoliteracy. However, when interviewed about more detailed indicators, students still did not show good ecoliteracy. As stated earlier, students already understand theories about a good and healthy environment, environmental problems, and their role in the environment, but only in terms of knowledge. Attitudes and behavior of students still do not show people who are ecoliterate. Goleman (2012) revealed that people who understand ecoliteracy are as follows, 1) Ecoliterate people recognize that they are members of a web of diverse relationships within their communities and beyond, 2) Ecoliterate people tend to be more aware that systems exist on various levels of scale, and 3) Ecoliterate people collectively practice a way of life that fulfills the needs of the present generation while simultaneously supporting nature's inherent ability to sustain life into the future.

Students are one of the parties that can realize the Sustainable Development Goals (SDGs). Through good ecoliteracy, students can help realize the 13th SDG (handling climate change). Ecoliterate students can protect the environment so as to reduce the impact of climate change. When students graduate and become teachers, they can also teach their students. Thus, the impact of climate change can be overcome. Therefore, students play an important role in realizing the 13th SDGs. To foster students' ecoliteracy, it can be started by changing students' understanding of environment issues. Changing in thinking, feeling, and acting will lead sustainable development (Lochner, Rieckkmann, & Robischon, 2021). When students have high ecoliteracy, they will become teachers who have high ecoliteracy as well. Students will also teach and be a model to students about ecoliteracy. Thus, sustainable development goals can be achieved.

2. Learning resources needed by students

The results of student questionnaires show that there are still students who have never sought information about ecoliteracy, namely 6.7%, the same as students who rarely seek information, while 46.7% are quite often and 40% often seek information. Regarding environmental issues and environmentally friendly products, students have looked for information with various percentages, the highest in the category often exceeding 40%. Most students search for information on Instagram as much as 73.3%, websites 60%, and YouTube 53.3% while the others look for books, journals, training, and relations. Although they got information from many resources, they did not have any systematic resources that accommodate all resources in one source. In the Natural Environment Course, there are no learning resources that are systematically arranged to improve student ecoliteracy.

In deepening interviews, students need books that can be used as the main reference for Natural Environment lectures. Pudiastuti (2014) argues that a book is a collection of forms of graphic communication whose contents are divided into several units with the aim of appearing systematic and keeping the contents preserved for a long time. Through systematic books, students can learn coherently. In addition, the book which is equipped with practical examples that are easy for students to do also makes it easier for students to implement an environmentally friendly life.

A good book must meet certain criteria. In Permendikbud Number 8 of 2016, it is explained that the requirements for a good book include, among other things, presentation of material that is attractively arranged, easy to understand, has a high level of readability, meets positive norms that apply in society, including not containing pornographic elements, understanding extremism, radicalism, violence, SARA, gender bias, and does not contain other deviation values, contains elements, namely the skin of the book, the beginning, the content, and the end of the book. In line with this opinion, Prastowo (2014) suggests that there are three main aspects in compiling a book, namely material, presentation, and language or readability which are explained in more detail as follows.

1. Material standards include the completeness of the material, the accuracy of the material, activities that support the material, up-to-date material, efforts to improve student competence, organization of material following scientific systematics, material developing skills and thinking abilities, material stimulating students to conduct inquiry, and use of signs and unit.
2. Presentation standards include overall presentation organization, chapter-by-chapter presentation organization, presentation considering the meaning and usefulness, actively involving students, developing knowledge formation processes, general appearance, variations in the way of delivering information, improving the quality of learning, anatomy of textbooks, paying attention to the code of ethics and copyright, and pay attention to gender equality and concern for the environment.
3. Standards of language/readability include using good and correct Indonesian, terms complying with Indonesian Spelling, clarity of language used, language suitability, and ease of reading.

The books needed are also expected to contain information related to ecoliteracy and learning in elementary schools that can foster ecoliteracy in elementary school students. Therefore, the learning resource that will be made is the Ecoliteracy-based Science Education Book which contains information related to ecoliteracy and learning in elementary schools that can foster ecoliteracy in elementary school students. The book contains information about ecoliteracy and science learning in elementary schools that can develop ecoliteracy for elementary students. The book will be focused on how the students aware about litter management and how to live healthier and eco-friendly. In addition, the

book is also equipped with YouTube, Instagram, and journal links as supporting information.

CONCLUSION

Based on the results and discussion, it can be concluded that it is needed to develop a systematic learning resource for enhancing students' ecoliteracy. The learning resources needed by students are Ecoliteracy-based Science Education Books. The book contains information about ecoliteracy and science learning in elementary schools that can develop ecoliteracy for elementary students. The developed book also includes youtube, instagram, and journal links as supporting information.

SUGGESTION

Based on the conclusions, the suggestions in this study include 1) It is necessary to develop learning resources that can increase student ecoliteracy, 2) It is necessary to increase student ecoliteracy through various ways, for example by implementing ecoliteracy-based learning in other courses and programs outside of lectures.

ACKNOWLEDGMENTS

Based on the conclusions, the suggestions in this study include 1) It is necessary to develop learning resources that can increase student ecoliteracy, 2) It is necessary to increase student ecoliteracy through various ways, for example by implementing ecoliteracy-based learning in other courses and programs outside of college. for the assistance of various parties. Therefore, we thank to:

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