



Students' Critical Thinking Skills and Sustainability Awareness in Science Learning for Implementation Education for Sustainable Development

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ABSTRACTS

Quality and competent human resources are needed in the 21st century. Based on the importance of critical thinking skills and sustainability awareness and ESD implementation, it is necessary to study critical thinking skills and sustainability awareness, as well as the need for teaching materials and ESD implementation. The main novelties in this study are acquiring critical thinking skills and sustainability awareness, as well as the need for teaching materials and the implementation of ESD in this study are expected to be a consideration in preparing teaching materials that can train students to think critically and have sustainability awareness to support ESD implementation. The method used is descriptive. The data is processed quantitatively and interpreted qualitatively. The study was conducted on 213 students and six junior high school teachers in the city of Bogor. The level of critical thinking skills of students is in the low category.. The total mean of 3.65 indicates that the level of sustainability awareness of students is a moderate level. The implementation of ESD is important to overcome various environmental problems that are currently occurring. ESD learning is expected to increase students' sustainability awareness and critical thinking skills. This study are expected to be a consideration in preparing teaching materials that can train students to think critically and have sustainability awareness to support ESD implementation.

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1. INTRODUCTION

Quality and competent human resources are needed in the 21st century. One of the skills that students need to have is critical thinking skills (Syarifah & Sumardi, 2015). Students must also care about the environment to support sustainable development. Learning in schools certainly requires teaching materials as a guide or a learning resource (Safitri & Festiyed, 2019).

There are several studies related to critical thinking skills, sustainability awareness and ESD implementation, namely on the profile of student sustainability awareness through ESD integration (Berglund et al., 2014; Thomas, 2009; Herremans & Reid, 2002). There are studies about Module Development Based on Education for Sustainable Development on Ecology Concepts (Rahman et al., 2019). Development of integrated science teacher model sequenced with education approach for sustainable development (Ridho, 2019). The profile of critical thinking skills of students on science learning (Hidayati & Sinaga, 2019). Embed ESD in Indonesia in dealing with global issues (Tristananda, 2018). However, there is no study about the relationship between students' critical thinking skills, sustainability awareness and the need for teaching materials and the implementation of ESD.

Based on the importance of critical thinking skills and sustainability awareness and ESD implementation, it is necessary to study critical thinking skills and sustainability awareness, as well as the need for teaching materials and ESD implementation. The method used is descriptive. The main novelties in this study are acquiring critical thinking skills and sustainability awareness, as well as the need for teaching materials and the implementation of ESD in this study are expected to be a consideration in preparing teaching materials that can train students to think critically and have sustainability awareness to support ESD implementation.

2. METHODS

The method used is descriptive. The data is processed quantitatively and interpreted qualitatively. The study was conducted on 213 students and six junior high school teachers in the city of Bogor. The research was conducted with an orientation towards sustainability awareness and critical thinking skills, also directed to reveal the need for teaching materials and the implementation of ESD. There are three groups of research subjects used, namely for the purposes of extracting information about critical thinking skills, sustainability awareness, as well as the need for teaching materials and the implementation of ESD.

3. RESULTS AND DISCUSSION

3.1 Critical thinking skills

Critical thinking skills are important skills and are needed to face challenges in the 21st century (Hidayati & Sinaga, 2019). Critical thinking skills are not innate so they can be applied, trained and developed through the learning process. The average score of students' critical thinking skills was 28.68%. This shows that the level of critical thinking skills of students is in the low category. Analysis of student answers shows the percentage of students who answered correctly with the right reasons for each aspect of critical thinking skills amounted to less than 10%. This shows that students' critical thinking skills need to be improved.

3.2 Sustainability awareness

Concern for the environment is very important for life today, or in the future because the lack of environmental awareness has caused a lot of environmental damage. Sustainability awareness can be built with knowledge and awareness of what to do or not (Salsabila *et al.*, 2019). The total mean of 3.65 indicates that the level of sustainability awareness of students at the three State Junior High Schools in Bogor is a moderate level.

The largest acquisition of sustainability awareness was emotional awareness (86.92%) and the smallest was sustainability practice awareness (37.95%). These results indicate that emotionally students have a high concern for their environment, but rarely or never take action or practice sustainability. This can be caused by the lack of efforts to familiarize students with sustainability practice awareness so that students rarely or never take sustainability actions or practices.

3.3 Need for teaching materials

Based on the results of observations about ESD among 6 teachers in three state junior high schools in Bogor City, it was found that the implementation of ESD is important to overcome various environmental problems that are currently occurring. ESD is expected to make students have sustainability awareness, especially in facing global problems, and think critically to solve problems by paying attention to the impact on various aspects of life. The results of the observations show that the development of ESD-based e-module teaching materials is needed to facilitate the implementation of ESD. The teachers also argue that overcoming various environmental problems requires critical thinking skills and sustainability awareness. The majority of teachers and students say that at this time, learning uses teaching materials in the form of books. Printed teaching materials are considered to have many limitations and prefer electronic teaching materials compared to printed teaching materials. Many students want to develop teaching materials that are easily accessible and can be used independently by students.

4. CONCLUSION

Based on the results and discussion, it can be concluded that ESD learning is expected to increase students' sustainability awareness and critical thinking skills. Sustainability awareness and students' critical thinking skills are very important to overcome various environmental problems. The development of ESD-based teaching materials is expected to facilitate the implementation of ESD. The teaching materials needed at this time are teaching materials that are easily accessible and can be used independently by students. With the increasing need for teachers and students for paperless teaching materials during this pandemic, reinforced by the need to strengthen critical thinking skills and sustainability awareness, the development of textbooks in the form of e-modules is an alternative that is very much needed by both teachers and students.

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6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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