

Elementary students' HOTS and attitude in environmental education: Sub topic of biology about disaster

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ABSTRACT

Environmental education in the context of a drought that has an impact on public health needs to be learned by elementary school students. The problem of this drought disaster has an impact on the sustainability of people's lives, including impacting elementary school students. Capabilities such as Higher Order Thinking Skills (HOTS) which are implemented in the form of an attitude of caring for the environment need to be developed. The purpose of this study was to describe HOTS scores and environmental care attitudes of elementary school students on the topic of drought and environmental care attitudes. The results of this study indicate that students' HOTS scores are still in the low category (27.70). As for the attitude of caring for the environment is in the moderate category (69.12). Environmental education needs to be developed to increase HOTS and environmental care attitudes related to drought disasters which have an impact on public health. The conclusion of this study is that students' HOTS scores are still in the low category and environmental care attitudes are still in the moderate category.

Keywords: attitude, disaster, environmental education, higher-order thinking skills (HOTS)

INTRODUCTION

Environmental education in elementary schools needs to be developed. One of the issues that is currently hot and the focus to be solved is related to drought which has an impact on decreasing the health quality of human life (Gholamrezai et al., 2021; Shao, 2021). This topic is important for elementary school students to learn because at school in thematic learning for the natural sciences sub-topic there are discussions related to efforts to maintain health in themselves and the surrounding community. The existence of environmental problems such as drought causes negative impacts on the environment, such as low production of nutritious food which in the long run will result in malnutrition in the community.

The implementation of environmental education in elementary schools is certainly

inseparable from scientific learning that is oriented towards solving problems. One of the abilities that can be used to solve problems is the Higher Order Thinking Skills (HOTS) ability that students can have (Maryani et al., 2022; Nugraha et al., 2020; Utomo et al., 2018). This HOTS ability is an ability to analyze, evaluate, and create solutions to various problems that may arise in the environment around where you live and at school. HOTS is one of the important skills that must be possessed by students in the 21st century to complete the 4 general skills of the 21st century that must be mastered by students including critical thinking, creative thinking, communication, and collaboration. Various studies that have been carried out related to HOTS include the development of the OIIDE (Orientation, Identify, Discussion, Decision, and Engage) Education model which was developed

for Biology learning (Husamah et al., 2018a, 2018b). Another model that is more developed for strengthening literacy is the Reading, Mind Mapping, and Sharing (RMS) model which prioritizes reading skills in students (Muhlisin, 2018; Muhlisin et al., 2016).

Cognitive abilities are indeed important for students to have, but no less important is the attitude of caring for the environment which elementary school students must also have, especially related to the problem of drought which has an impact on health. The attitude of caring for the environment can be defined as an attitude oriented towards protecting the environment (Ballard & Mooring, 2021; Chierrito-Arruda et al., 2018; Haanpää, 2007). Elementary school students need an attitude of caring for the environment as a form of implementation of the knowledge they already have related to the environment. Various studies related to environmental care attitudes have been carried out. One of them is the research that has been conducted in the community which shows that an attitude of caring for the environment requires a supporting activity so that an attitude of caring for the environment can be maintained. An attitude of caring for the environment needs to be developed in this case elementary school students. Various activities in schools can support the formation of an attitude of caring for the environment. Learning natural sciences in this case must facilitate students to be able to develop their abilities in environmental education.

Environmental issues related to drought which have an impact on health are one of the contextual topics for elementary school students to study. Drought that occurs during the dry season will be very relevant for students to experience in everyday conditions so that it will be relevant for elementary school students to learn in integrated thematic learning with environmental education (Berger et al., 2018; Sharpe & Kelman, 2011). Based on this description, there is an urgency that it is necessary to carry out a descriptive analysis

related to HOTS related to the impact of drought on student health. This topic is one of the relevant topics to study because students are part of a community group who need to know this through environmental education in schools. The implementation of HOTS knowledge and attitude towards environmental sustainability is very important.

The purpose of this research was to describe the HOTS and attitude of students' about disaster. This research has a contribution in updating a literature in relation to knowledge and attitudes related to natural disasters. This research is an effort to improve literature review for teachers and lecturers in developing environmental education.

METHOD

The method used in this study was descriptive method with the target respondents being elementary school students in grades 5 and 6. The data collection technique used in this study was a survey. The instrument used is in the form of test questions to measure HOTS abilities starting from C4, C5, and C6 according to the Taxonomy Anderson et al. (2001). The test questions that were developed were then made into several indicators according to aspects C4, C5, and C6. Students' have studied this topic in science lessons. The validity and reliability used to measure this instrument is the validity test with the Pearson product moment and the reliability using the split half technique.

In addition to measuring HOTS, this research also developed an instrument to measure students' attitudes related to the issue of drought and its impact on health. As for the indicators of students' attitudes related to the issue of drought, it consists of several indicators, namely (1) saving water; (2) use of water for vehicles; (3) protecting water by planting trees and preventing pollution; (4) green areas in schools; (5) sanctions and warnings for not saving water.

The sample for this study were elementary

school students in grades 5 and 6 with a total of 137 students from one of the schools in Bekasi. The research sample was selected by simple random sampling. The data analysis used in this study was to compare the average HOTS scores and student attitudes with the referred categories [Sigit et al. \(2020\)](#). The results of the comparison of these scores will be used as material for analysis to categorize scores from HOTS and students' environmental care attitudes fall into certain categories. As for the HOTS categorization table and student attitudes, it can be seen in Table 1.

Table 1. HOTS score categories and student attitudes

Category	Interval Score
Very High	$X > 81.28$
High	$70.64 < X \leq 81.28$
Moderate	$49.36 < X \leq 70.64$
Low	$38.72 < X \leq 49.36$
Very Low	$X \leq 38.72$

RESULTS AND DISCUSSION

The results of this study indicate that students' HOTS scores related to the issue of drought impacting human health are still in the low category. This shows that the development of teaching materials related to environmental education is still lacking. The HOTS score, which is still low, needs to be improved by developing learning. The results of students' HOTS scores related to the issue of drought which impact on health can be seen in Table 2.

Table 2. Results of SD students' HOTS scores

No	Item	Score
1	Give an explanation related to the phenomenon of drought (lack of water during the dry season) that occurs in several areas during the dry season, what do you think is the cause? Explain from an environmental perspective	2.88
2	Give an explanation regarding the efforts that can be made by the community when experiencing drought, state your explanation in detail	2.33
3	Do you think drought is one of the impacts of global environmental	1.81

	damage? What is your opinion regarding this matter	
4	What do you think about efforts to plant trees in urban areas, can they reduce the impact of drought and preserve the environment? State your opinion	2.88
5	If you experience drought, what creative ideas can you do to get clean water without destroying the environment? Explain	2.53
6	Explain creative ways you can do to invite your friends to save water so they don't experience drought during the dry season	4.19
Total		16.62
Scale 0-100		27.70
Category		Very low

The HOTS measurement results for elementary school students related to drought indicate that the lowest score is on the C5 (evaluate) aspect. This shows that elementary school students are still weak in their ability to evaluate. The results of the full score can be seen in Table 3.

Table 3. Aspects of SD students' HOTS related

Aspects	Score
C4 (Analyze)	2.60
C5 (Evaluate)	2.35
C6 (Create)	3.36

The attitude of caring for the environment plays an important role in the implementation of environmental education. The lowest point is in item -3 which is related to the use of public transportation to reduce the use of water for washing vehicles. The average score for caring for the environment is in the moderate category. The full results of an attitude of caring for the environment can be seen in Table 4.

Table 4. Results of scores of students' environmental care attitudes related to drought

No	Item	Score
1	Water conservation needs to be done to prevent drought	4.66
2	Owned water resources must be properly maintained for environmental sustainability	4.55
3	I support the use of public transportation because it will reduce the use of water for washing vehicles	3.53

4	Excessive washing of vehicles wastes water and damages the environment	3.64
5	Planting trees will help in maintaining groundwater resources	4.45
6	There must be strict sanctions for people who damage the environment and cause water pollution	4.36
7	There must be development efforts related to green areas/parks in schools	4.33
8	In front of the class it is necessary to make a biopore to absorb water into the ground	4.01
9	Friends who don't save water should be given a warning	4.23
10	It is necessary to socialize the use of detergents so as not to pollute the water environment	3.71
Total		41.47
Scale 0-100		69.12
Category		Moderate

Based on the measurement results of environmental care attitudes for each item, environmental care attitudes can be measured based on each indicator. The score for each indicator can be seen in full in table 4. The highest score is found in the indicator related to saving water, while the lowest score is found in the second indicator, namely the use of water for vehicles.

Table 5. Indicators of environmental care for elementary school students related to drought

No	Indicator	Score
1	Water saving	4.61
2	Use of water for vehicles	3.58
3	Conserve water by planting trees and preventing pollution	4.40
4	Green area in school	4.17
5	Sanctions and reprimands for not saving water	3.97

The results of this study indicate that the HOTS score is relatively at a low level. This indicates that students' abilities related to HOTS are already at a low level and need to be continuously improved. The efforts that can be made to improve HOTS abilities can be done by developing various learning media. The website is

an example of media that can be used to develop students' HOTS skills in analyzing drought disaster problems. The website is a medium that can be integrated with various platforms that aim to convey information related to learning (Fitriani et al., 2018; Glynn et al., 2007). The drought disaster needs to be anticipated with HOTS thinking skills which are trained by using the media.

Another way that can be done is to create a learning model that is integrated with environmental education in the topic of Natural Sciences, especially the discussion of Biology. The environmental education model that is developed must be able to be used in various situations and classroom conditions experienced by students. One of them is related to the condition of students in the class who are less active, the learning model developed must be able to make students become active in learning. One of the benefits of active learning is that teachers can invite students to actively provide opinions and arguments related to issues being discussed in class (Bevan, 2017; Buzov, 2014; Sheakley et al., 2019; Zaid et al., 2018). Environmental education is active learning and is used to get to know nature including its impact on health. Environmental education that is developed in the form of a model in the context of a drought disaster that has an impact on health must be in accordance with its objectives to solve existing problems related to health.

Environmental education in class is related to the efforts made to integrate the latest topics in the environment with science learning, especially in the sub-topics of biology. One of them is the topic of science, the sub-topic of biology, which discusses disasters and their impact on health. Environmental education in this case certainly plays an important role in maintaining the surrounding environment so that it remains sustainable and sustainable. One indicator of the implementation of environmental education going well is the creation of pro-environmental behavior in students (Li et al., 2022; Meyer, 2016), especially in science learning with the

theme of Biology. Environmental education needs to be developed further on certain themes. Environmental education is needed to develop sustainable development in the future.

HOTS capability and an attitude of caring for the environment in this case are needed so that the implementation of environmental education can run well and achieve graduate competency (Aguilar-Salinas et al., 2017; Panno et al., 2018). Environmental education in this case needs to be developed in order to maximize sustainable development efforts. HOTS abilities in this case need to be trained by maximizing learning activities based on students' analytical skills. HOTS according to what Anderson said consists of 3 levels, namely analyze, evaluate, and create. This HOTS ability is of course in accordance with the needs of students in the 21st century who require self-actualization and adjustment to competition with fellow colleagues in the 21st century. So it is necessary for environmental education in elementary schools to be carried out on a HOTS basis which is then applied with an attitude of caring for the environment.

The results of this study indicate that the development of biology learning tools that are oriented towards environmental education is urgently needed. The results of this study also complement the results of other studies which have not shown high results for HOTS scores and student attitudes. The results of this study also follow up on these findings for future research.

CONCLUSION

Based on the results of the research that has been done, it can be concluded that the HOTS scores of elementary school students related to drought are still in the low category. This needs further efforts to improve HOTS for elementary school students. The environmental care attitude of students is already in the moderate category. As for environmental education, in this case it plays an important role in providing information related to the environment that has an impact on health. HOTS abilities are useful for students so

they can contribute to overcoming problems that occur in their surroundings. The limitations of this study are related to the difficulty of access to obtaining a wider sample, so that the scope of this research is still limited to certain areas. Suggestions for future research are to develop educational models related to environmental education at the elementary school level to overcome the low HOTS and environmental care attitudes of students related to drought which have an impact on health.

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