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Al Ibtida

## **Sustainable Awareness About Climate Change on Elementary School Pupils' Perspective: What Wonderful Finding!**

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### **Abstract**

Climate change is a serious issue that has become a global problem, so it needs to be responded to and handled immediately. This study aims to obtain an overview of elementary school students' ongoing awareness of climate change. Sustainable awareness is the basis for someone to change their behavior in controlling climate change. This type of research is ex post facto with descriptive quantitative methods used in this study. The instrument for exploring sustainable awareness data is a questionnaire containing 27 statement items that integrate aspects of knowledge, attitudes, and behavior, with environmental, social, and economic dimensions. The questionnaire uses a Likert scale of 1-4, with the choices of strongly agree, agree, disagree and strongly disagree. Respondents were 467 grade 4 elementary school students in the city of Bandung, Indonesia. The questionnaire was filled out online via the Google form within one week. The data obtained was processed and analyzed descriptively quantitatively by calculating the average and percentage of each item, dimensions and aspects of sustainable awareness. The study results revealed that students have a high awareness of sustainability, especially regarding knowledge and environmental dimensions. The findings have implications for introducing students

to other aspects and dimensions of sustainable awareness regarding climate change at the elementary school level.

Keywords: *sustainable awareness, climate change, elementary school students.*

### **Abstrak**

Perubahan iklim merupakan isu serius yang menjadi permasalahan global sehingga perlu direspon untuk segera ditangani. Penelitian ini bertujuan untuk memperoleh gambaran mengenai kesadaran berkelanjutan siswa sekolah dasar akan perubahan iklim. Kesadaran berkelanjutan menjadi dasar untuk seseorang mengubah perilakunya dalam mengendalikan perubahan iklim. Jenis penelitian *ex post facto* dengan metode kuantitatif deskriptif digunakan dalam penelitian ini. Instrumen untuk menggali data kesadaran berkelanjutan berupa angket yang berisi 27 item pernyataan yang merupakan integrasi aspek pengetahuan, sikap, dan perilaku, dengan dimensi lingkungan, sosial, dan ekonomi. Angket menggunakan skala Likert 1-4, dengan pilihan sangat setuju, setuju, tidak setuju, dan sangat tidak setuju. Responden adalah 467 siswa kelas 4 sekolah dasar di Kota Bandung, Indonesia. Pengisian angket dilaksanakan secara daring melalui *google form* dalam kurun waktu satu minggu. Data yang diperoleh diolah dan dianalisis secara kuantitatif deskriptif dengan menghitung rata-rata dan persentase setiap item, dimensi, dan aspek kesadaran berkelanjutan. Hasil penelitian mengungkap bahwa siswa memiliki kesadaran berkelanjutan yang tinggi, terutama pada aspek pengetahuan dan dimensi lingkungan. Temuan berimplikasi pada pentingnya mengenalkan siswa pada aspek dan dimensi lainnya dalam konsep kesadaran berkelanjutan terkait perubahan iklim pada jenjang sekolah dasar.

Kata kunci: *kesadaran berkelanjutan, perubahan iklim, siswa sekolah dasar.*

## **INTRODUCTION**

Climate change is a global issue that has become a prominent issue since the Earth Summit was held in Rio de Janeiro, Brazil, in 1992. As a result, climate change hinders the achievement of the Millennium Development Goals. It is one of the most severe challenges in achieving sustainable development goals for the international community (Anderson, 2012). Even in 2009, the international scientific community had a broad consensus to recognize global climate change as a significant threat to all societies (Sharma, 2012).

Phenomenon and impacts of climate change are becoming more evident and threatening the sustainability of life. The increase in the concentration of carbon dioxide gas in the atmosphere due to human activities is allegedly the cause of the rise in greenhouse gases. Increasing greenhouse gases is causing climate change (Legates, et al. , 2015; Sharma, 2012). The phenomenon that has appeared, such as ice at the poles, shifts in seasons, rising sea levels, food supply crises, clean water crises, the wide spread of tropical diseases, and loss of millions of species of flora and fauna (Meiviana, et al. , 2003; Sharma, 2012). This can exacerbate agricultural production, infectious diseases, migration flows, poverty, and conflict (Bangay & Blum, 2010). Ultimately, climate change impacts ecological aspects related to human health, culture and society, as well as on a broad scale, from the personal to the global (Herman, Feldman, & Vernaza-Hernandez, 2017).

Communities need to have sustainable awareness regarding climate change as a basis for efforts to overcome it. This is based on the fact that climate change is a complex matter that involves various individuals and communities to control it. Hamid, et al. (2017) said that

sustainability awareness is an essential prerequisite for changing manners and behaviour in protecting the natural environment in the face of climate change and global warming.

The concept of sustainable awareness is defined as a concept that integrates the environmental, social, and economic dimensions of sustainable development (Kalsoom, Khanam, & Quraishi, 2017). These dimensions include knowledge, manner, and sustainable behaviour (Olsson, Gericke, & Chang Rundgren, 2016). Sustainability awareness is awareness of sustainability issues, solutions, values, and healthy behaviour resulting from sustainability (Kalsoom, et al .., 2017). Olsson, et al. (2019) describe sustainable awareness as a combination of conscious knowledge, manner, and behaviours related to sustainable development's environmental, social, and economic components. In sustainable awareness, learning does not refer to pure factual knowledge. Still, the ability is determined by recognizing the fundamental concepts of sustainable development and is measured by the degree of recognition of these foundations.

Since the last few years, climate change has become a debatable issue that discussed by researchers, including in the field of education. Some of the studies include teachers' perceptions of climate change (Hannah & Rhubart, 2020; Herman et al., 2017), students' perceptions of climate change (Littrell et al., 2020), public perceptions of climate change (Lowe et al., 2006 ), prospective teacher understanding of climate change (Hestness et al., 2011; Papadimitriou, 2004; Shea, Mouza, & Drewes, 2016), teacher understanding of climate change (Ratinen, Viiri, & Lehesvuori, 2013; Seroussi et al., 2019), student evaluation of climate change (Lombardi, Brandt, Bickel, & Burg, 2016), teacher training to teach climate change (Plutzer & Hannah, 2018), systems thinking about climate change (Waddington & Fennewald, 2018).

However, some of these studies have not included research on students' ongoing awareness of climate change, especially elementary school students. Research on this matter is essential, considering that children are the group most vulnerable to the negative impacts of climate change (Gkatzos, 2017), mainly because their immunity is not fully developed (Benevento, 2022). Thus, cultivating sustainable awareness from an early age is necessary so that they can act to maintain environmental sustainability, especially regarding climate change. One of the successes of education for sustainable development is the cultivation of ecological awareness from an early age (Adriyanto et al., 2021). Therefore, this research used descriptive quantitative methods to obtain an overview of students' ongoing awareness of climate change. It is hoped that the research results can provide information related to the understanding of climate change so that it becomes a reference in teaching climate change adaptation and mitigation efforts as early as possible.

## **METHODS**

This research captures the empirical facts of elementary school students' ongoing awareness of climate change, so this type of research is *ex post facto* research (Gall, Gall, & Borg, 2010). This type of research is because the researcher does not exercise control over the independent variables where manifestations have occurred, or these variables cannot be manipulated inherently. The research method used is descriptive quantitative. Descriptive research aims to describe the characteristics of a group's phenomena or events (Suter, 2012) at one time or changes over time but does not explore causal relationships (Gall et al., 2010).

The research began with the preparation of instruments to gather information regarding students' ongoing awareness of climate change. The questionnaire used was adapted from Gericke, et al., (2019); Kalsoom, et al., (2017); Olsson, et al., (2019) which contains 27 items related to sustainable awareness. Researchers integrated climate change into the questionnaire to compile a sustainable awareness questionnaire about climate change. The items in the questionnaire include aspects of sustainable understanding, namely knowledge, manner, and behavior regarding sustainability in the environmental, social, and economic dimensions of climate change. The instrument uses a Likert scale of 1-4 (1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree).

The instruments that have been compiled are then distributed online via the Google form. The respondents to the questionnaire are grade 4 students from 10 elementary schools in the city of Bandung, Indonesia in the 2021-2022 academic year. Grade 4 students were selected, assuming they had studied simple weather and climate-related concepts in the previous class. A total of 467 students voluntarily filled out the questionnaire within one week. Data obtained from the questionnaire were then analyzed descriptively for each item, aspect, and dimension of sustainable awareness related to climate change.

## **RESULTS AND DISCUSSION**

Students' sustainable awareness includes knowledge, manner, and behavior related to climate change in each element's environmental, social, and economic dimensions. Quantitative data analysis on each aspect is presented as follows.

Table 1. Climate Change Sustainable Awareness Analysis based on Aspect

| <b>Aspect</b> | <b>Average (%)</b> |          |           |            |
|---------------|--------------------|----------|-----------|------------|
|               | <b>SA</b>          | <b>A</b> | <b>DA</b> | <b>TDA</b> |
| Knowledge     | 46,6               | 49,3     | 3,8       | 0.2        |
| Manner        | 40,1               | 53,6     | 5.0       | 1,2        |
| Behavior      | 37,3               | 54,6     | 7,3       | 0.8        |
| Average       | 41,3               | 52.5     | 5,4       | 0.7        |

Based on Table 1, it can be seen that students have high sustainable awareness regarding climate change, as 93.8% of students respond in agreement and strongly agree with each statement given. The knowledge aspect has the highest average compared to other elements. Statement items related to climate knowledge generally tend to be the same as knowledge related to other environmental issues, such as saving water, preserving living things, how to protect oneself, solving problems peacefully, etc., in preventing and addressing the problem of climate change. Not much different from knowledge, statement items related to the manner towards climate change have the same tendency. The statements presented include the manner towards the use of natural resources, the importance of laws, the importance of overcoming the problem of climate change, etc. in preventing and addressing climate change. This tends to be familiar to students because they are often discussed in learning related to the environment, both knowledge and manner.

Compared to the others, the behavioral aspect has a smaller proportion. This finding is in line with the results of research by Olsson, et al., (2016), which revealed that behavioral aspects obtained a lower average than other aspects. The emergence of behavioral aspects requires other aspects, as Hamdan Alghamdi & El-Hassan (2019) stated that a person's knowledge and manner could encourage and guide their behavior, whether they realize it or not. In addition, behavior cannot be grown instantly and spontaneously but requires quite a long time (Hassan, Noordin, & Sulaiman, 2010). Therefore, behavior can be cultivated by combining cognitive reasoning and attitude awareness (Scoffham & Consorte-McCrea, 2018). Every aspect of sustainable awareness includes environmental, social, and economic dimensions. Data related to each dimension is presented in the following table.

Table 2. Climate Change Sustainable Awareness Analysis based on Dimensions

| Dimensions  | Average (%) |      |     |     |
|-------------|-------------|------|-----|-----|
|             | SA          | A    | DA  | TDA |
| Environment | 40,1        | 53,9 | 4,7 | 1,3 |
| Social      | 47.5        | 50,6 | 1,7 | 0.3 |
| Economy     | 36.5        | 53.0 | 9,6 | 0.7 |
| Average     | 41,3        | 52.5 | 5,4 | 0.7 |

In Table 2, the environmental dimension has the highest percentage gain and the lowest economic dimension. The ecological dimension is very contextual with the lives of elementary school students compared to the social and economic dimensions. Students strongly associate the concept of sustainability with their environment compared to social and economic dimensions (Kagawa, 2007). They have not been able to analyze the relationship between environmental problems, especially climate change, on social life, even the economy. This finding is corroborated by the research results of Hassan, Noordin, & Sulaiman (2010), that students do not understand the connectedness of several dimensions, namely social and economic, with environmental problems, as well as the issue of climate change.

The following discussion examines sustainable awareness for each aspect and dimension. An overview of knowledge aspects in all dimensions is presented in the following table.

Table 3 . Knowledge Aspect Awareness of Sustainable Climate Change

| Aspect    | Dimensions  | Items | Percentage |      |     |     |
|-----------|-------------|-------|------------|------|-----|-----|
|           |             |       | SA         | A    | DA  | TDA |
| Knowledge | Environment | 1     | 67,4       | 31,9 | 0.7 | 0   |
|           |             | 2     | 44.9       | 49,8 | 4,5 | 0.9 |
|           |             | 3     | 48.5       | 50,4 | 1,1 | 0   |
|           | Social      | 4     | 40,2       | 56   | 3,4 | 0.4 |
|           |             | 5     | 40,9       | 55,1 | 4   | 0   |
|           |             | 6     | 56         | 42,6 | 1,3 | 0   |
|           | Economy     | 7     | 36,4       | 56,2 | 7   | 0   |
|           |             | 8     | 32,6       | 58,1 | 8,9 | 0   |
|           |             | 9     | 52,6       | 43,6 | 3,4 | 0.4 |
| Average   |             |       | 46,6       | 49,3 | 3,8 | 0.2 |

Based on the aspect of knowledge, environmental knowledge obtains the highest percentage. This finding aligns with the results of a study by Clark & Zeegers (2015) which

showed that students' perceptions regarding sustainability had expanded but tended to focus on the environment. Even so, students did not yet have sufficient knowledge about conserving the diversity of living things as part of efforts to overcome the impacts of change. Climate and the importance of teaching people how to protect themselves from the effects of climate change. They do not yet understand that addressing the impacts of climate change requires a different strategy and more than other environmental problems.

In the second place, students' knowledge of the social dimension shows that they understand that solving climate change problems must be carried out peacefully and that they need to learn how to prevent and overcome climate change at school. But they don't understand that solving the problem of climate change cannot be done alone but involves various layers of society. Finally, economic knowledge shows that students do not yet have adequate knowledge regarding corporate responsibility, the importance of distributing goods and services as a form of economic justice, and poverty alleviation with a sustainable awareness of climate change. This data is as revealed by Michalos et al. (2012) that almost a third of the student respondents did not respond positively to the importance of economic justice in sustainable awareness.

The second aspect is the manner or attitude aspect, which includes environmental, social, and economic dimensions. Data analysis on the attitude aspect is presented in the following table.

Table 4 . Aspects of Attitudes on Sustainable Awareness of Climate Change

| Aspect   | Dimensions  | Items | Percentage |      |      |     |
|----------|-------------|-------|------------|------|------|-----|
|          |             |       | SA         | A    | DA   | TDA |
| Attitude | Environment | 10    | 29,6       | 45,5 | 17,7 | 7,2 |
|          |             | 11    | 27         | 64   | 7,7  | 1,3 |
|          |             | 12    | 26,6       | 70,6 | 2,3  | 0,4 |
|          | Social      | 13    | 50         | 49,1 | 0,4  | 0,5 |
|          |             | 14    | 40         | 56,8 | 2,6  | 0,6 |
|          |             | 15    | 58,5       | 39,8 | 1,5  | 0,2 |
|          | Economy     | 16    | 41,1       | 54   | 4,7  | 0,2 |
|          |             | 17    | 46,2       | 49,4 | 3,8  | 0,6 |
|          |             | 18    | 42,1       | 53,4 | 4,3  | 0,2 |
| Average  |             |       | 40,1       | 53,6 | 5,0  | 1,2 |

Based on Table 3, it is pretty interesting that the social dimension in the attitude aspect has the highest percentage compared to the other dimensions. This shows that students' attitudes are related to the context (Clark & Zeegers, 2015), although still narrow. Some of the surprising things that students think climate change is currently threatening future generations' lives. In the knowledge dimension, several students feel that excessive use of natural resources is unrelated to climate change. Finally, the economic dimension shows that not all students feel that reducing plastic and single-use packaging materials, poverty, and the company's treatment of all employees are related to climate change. This finding aligns with the results of a study by Michalos et al. (2012).

The last aspect is behavior. Data analysis on the behavioral aspects of all dimensions is presented in the table 4.

Table 4 . Behavioural Aspects of Climate Change Sustainable Awareness

| Aspect    | Dimensions  | Items | Percentage |      |      |     |
|-----------|-------------|-------|------------|------|------|-----|
|           |             |       | SA         | A    | DA   | TDA |
| Behaviour | Environment | 19    | 29,1       | 67,4 | 2,8  | 0,6 |
|           |             | 20    | 34,7       | 58,3 | 5,7  | 1,3 |
|           |             | 21    | 52,8       | 47   | 0,2  | 0   |
|           | Social      | 22    | 46,2       | 52,1 | 1,3  | 0,4 |
|           |             | 23    | 43,4       | 55,7 | 0,4  | 0,5 |
|           |             | 24    | 51,9       | 47,9 | 0,2  | 0   |
|           | Economy     | 25    | 44         | 54,7 | 1,1  | 0,2 |
|           |             | 26    | 9,1        | 44,5 | 43,6 | 2,8 |
|           |             | 27    | 24,3       | 63,4 | 10   | 1,5 |
| Average   |             |       | 37,3       | 54,6 | 7,3  | 0,8 |

As can be seen in Table 4, it is known that the order of the percentage from the largest is obtained by the social, knowledge, and economic dimensions. In the knowledge dimension, sorting waste is a behavior that not all students have carried out, even though this behavior is a discussion and habit that is always encouraged in every school. In addition, on the social dimension, some students still do not treat other people respectfully when communicating through devices, as found by Michalos et al. (2012). A lack of understanding regarding communication ethics can hinder efforts to control climate change. On the economic dimension, almost half of the students do not realize that buying used goods can help prevent climate change; likewise, with efforts to avoid buying goods from companies unaware of the environment, even though the proportion of students is smaller.

Based on the presentation of the findings in each aspect, both in the environmental, social, and economic dimensions, students tend to understand more concrete and contextual things in their lives. Knowledge of the social and economic dimensions of climate change is still an abstract and distant matter for students, so efforts are needed to introduce students to this in learning. The implication is that the teaching carried out by the teacher in the classroom is designed in such a way as to build students' sustainable awareness comprehensively on all aspects and dimensions related to the issue of climate change.

## CONCLUSION

This study aims to obtain an overview of elementary school students' ongoing awareness of climate change. Researchers collected data through questionnaires that were distributed online to fourth-grade elementary school students in the city of Bandung. The study results show that overall, student awareness regarding climate change is relatively high. The findings reveal that elementary school students have a heightened awareness of knowledge and environmental dimensions. This is because many discussions about the environment have been carried out in school learning, which is more concrete and contextual to their lives. In contrast to the other two dimensions, namely social and economic, students do not have sufficient ability to influence climate change on the social and economic dimensions due to limitations in their cognitive development and the breadth of their life dimensions. These findings recommend the need for efforts to introduce students to climate

change and its relationship with social and economic dimensions, especially in the learning process.

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