

High School Students Awareness and Attitudes Toward Climate Change

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DOI:10.20527/bipf.v10i3.14001

Received: 26 July 2022 Accepted: 2 December 2022 Published: 18 December 2022

Abstract

Climate change is a tremendous threat to the environment and human beings. Students are among the younger generation who immediately feel the effects of climate change. The younger generation is expected to have the knowledge and a positive attitude toward the framework for climate change adaptation and mitigation. The objectives of this study describe awareness and attitudes concerning climate change held by 611 high school students in South Sumatra. The methods of this study employed qualitative research. The findings of this research indicated that 98.4% of students were aware of climate change. Additionally, more than 80% of students know climate change contributes to droughts, floods, declining water quality, and the spread of vector-borne illnesses such as dengue fever and malaria. 95.7 % of students have a positive attitude toward mitigating climate change.

Keywords: Awareness; Attitude; Climate Change; Mitigation

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How to cite: Deshiana, A., Sriyanti, I., & Ismet, I. (2022). High school students awareness and attitudes toward climate change. *Berkala Ilmiah Pendidikan Fisika*, 10(3), 255-239.

INTRODUCTION

Climate has threatened the environment tremendously and impacts living things' survival (Masson-Delmotte et al., 2018). Climate change impacts not just rising temperatures (Hayhoe et al., 2018; Vose et al., 2017), but also changes in rainfall patterns (Lall et al., 2018; Ostad-Ali-Askari et al., 2020), changes in humidity of an area, and rising sea levels (Fleming et al., 2018; Leuliette, 2014).

Changes in the Earth's orbit and spin, variations in solar activity, and volcanic activity are natural causes of climate change (Hegerl et al., 2019; Wuebbles et al., 2017). According to research conducted over the past 50 years, climate change is mostly affected by human

activities that produce carbon emissions and greenhouse gases in the atmosphere, such as burning fossil fuels, industrialization, and deforestation (Bennett, 2017; Prevedello et al., 2019). Human activities can raise the concentration of greenhouse gases, changing the balance of global temperature variations in several regions (Schoor et al., 2013). These gas emissions consequently warm the atmosphere, oceans, and land, affecting the hydrological cycle (Masson - Delmotte, V. et al., 2021). As a result, changes to the hydrological cycle will affect vector disease transmission (Caminade et al., 2019; Semenza & Suk, 2018).

People worldwide have likely felt the effects of climate change, but they do not understand the reasons or the action to mitigate these effects (Haider, 2019; Sola & Michael, 2016). As a solution, society would have sufficient awareness about the causes, effects, and adaptive actions to mitigate climate change's effects (Malgwi & Joshua, 2021; Mochizuki & Bryan, 2015). This information will guide individuals to behave in an environmentally responsible manner (Eze, 2020; Higde et al., 2017) and affect their activities in adapting to climate change and mitigating its effects (Akhtar et al., 2018; Mustafa et al., 2019; Okaka & Odhiambo, 2018).

Future adaptation and mitigation of climate change will require the participation of all sides, especially the younger generation. The youthful generation is supposed to be aware of the causes and effects of climate change and be concerned about them. Therefore, education serves as one of the social pillars that raise the younger generation's climate change knowledge, awareness, and attitudes (García Vinuesa et al., 2022; Kuthe et al., 2020). Education contributes to bridging gaps in scientific and social comprehension of climate change (Bofferding & Kloser, 2015; Lavonen & Laaksonen, 2009).

Climate change has become a part of science education (Carman et al., 2021; Siegner & Stapert, 2020) and can help young people acquire environmental curiosity, motivation, and a sense of responsibility (Asilsoy et al., 2017; Karpudewan & Mohd Ali Khan, 2017). Incorporating climate change content into scientific education significantly impacts students' awareness and attitudes as the next generation (Malandrakis et al., 2011; Shepardson et al., 2011). Science education can help learners achieve the information, abilities, and attitudes required to become change agents, policymakers, and influencers in the future (Kuthe et al., 2019). Climate

change and global warming have been integrated into the 2013 physics curriculum. In the 2013 curriculum, students are required to be able to analyze the symptoms of global warming and their effects on life and the environment. In addition, students are expected to provide solutions to the problem of global warming, taking into account its symptoms and effects on life and the environment.

Numerous studies on climate change awareness (Eugenia, Udegbumam & Onyegegbu, 2021; Eze, 2020). Research study research on climate change awareness has been performed by (Eugenia, Udegbumam & Onyegegbu, 2021; Eze, 2020). The results of this study indicate that pupils' levels of awareness vary. This variation is due to the school curriculum offered in schools (Eze, 2020), cultural differences and people's perspectives on climate change responses (Monroe et al., 2019), and pupils' level of climate literacy (Oliver & Adkins, 2020). According to studies (Eze, 2020), students who major in Science and Social Sciences are more aware than those who major in the arts. This is because art students study climate change less frequently than Science and Social Science majors. If art students do not study the curriculum on climate change, they have limited knowledge of climate change.

To increase students' awareness and information about climate change, it is hoped that the curriculum will be integrated into the art student curriculum, such as incorporating the themes of climate change and environmental safety when students study literary texts, language texts, novels and films. This research aimed to describe awareness and attitudes concerning climate change held by 611 high school students in South Sumatra.

METHOD

This qualitative descriptive study describes the awareness and attitudes of high school students in South Sumatra towards climate change. The study was conducted on 611 students in five randomly selected public high schools consisting of 47% of class X students, 35.7% of class XI students and 17.3% of class XII students. Data was collected using a questionnaire distributed online. The questionnaire consists of 12 statements, six regarding students' awareness of climate change and six other statements regarding students' attitudes towards climate change. The awareness instrument in this study was adapted from (Higde et al., 2017). The dimensions of awareness measured in the study include students' views on climate change and its impact on the environment and students' willingness to participate in reducing the impacts of climate change. The attitude instrument used in this study was adapted from the research (Hermans & Korhonen, 2017). Attitude dimensions measured in this study are students' views on the experience of climate change as a risk and belief in climate change mitigation.

RESULT AND DISCUSSION

Awareness Of Climate Change

Awareness of climate change is a component of environmental consciousness. Environmental awareness is defined as the ability to comprehend changes in the surrounding environment, the causes and effects of a disaster, and the feeling of responsibility to preserve it (Adejoke et al., 2014; Apichatibutarapong, 2018). Awareness of environmental issues is an effective aspect of the environment that allows pupils to treat the environment with extra care (Cui et al., 2015). Thus, environmental awareness can be defined as an individual's ability to identify environmental change indicators and take steps to mitigate the negative effects

of these changes. A person who is aware of the topic of climate change can identify signs of climate change, its causes, and its effects, as well as take individual or group actions to mitigate the effects of climate change (Halady & Rao, 2009; Hasan & Akhter, 2011)

In this study, the researcher investigated students' perspectives on climate change and their motivations to combat climate change. The study found that 98.4% of pupils had heard about climate change and global warming. These latest results contrast with the PISA report (Oliver & Adkins, 2020), which states that 55.7% of PISA test-takers are familiar with the term climate change. However, a considerable percentage of students (24.6%) felt they needed more knowledge regarding climate change, and 9.8% of students had never heard of greenhouse gases in the atmosphere.

Most students have heard the term climate change because high school students have received material on climate change and global warming at the previous level. In addition, 75% of students get information on climate change through social media. According to (Westerman et al., 2014), social media is a source of information used by the younger generation to obtain information about climate change. Social media technology offers new ways of sharing knowledge and awareness and getting the public involved in the movement to support handling the negative effects of climate change (Fernandez et al., 2016; Mavrodieva et al., 2019; Newell & Dale, 2015).

More than 80% of students feel climate change can change weather patterns in their environment. In addition, students also agree that climate change causes disasters such as floods and droughts (85.9%), decreased pristine water quality (80.9%), and the spread of vector diseases – such as dengue fever and malaria (80.4%). This study's results

align with research (Malgwi & Joshua, 2021) which states that some students also feel a change in weather patterns in the last ten years. Students identify changes in weather as the main cause of the droughts, floods and heat waves experienced by the region in the last ten years.

The researcher also explored students' opinions about who is responsible for tackling climate change. Almost 80% of respondents consider that environmental agencies and the ministry of the environment are the main parties responsible for addressing the impacts of climate change. Students consider climate change a small risk compared to global-scale risks (Özdem et al., 2014). Students view international agreements, legislative representation and education as effective mitigation strategies (Ambusaidi et al., 2012; Boyes et al., 2014). It contradicts research (García Vinuesa et al., 2022), which states that 30% of students feel that environmental organizations are responsible for addressing the climate change crisis. In research (Hermans & Korhonen, 2017), students view climate change as an international responsibility. In addition, students are aware that each individual can contribute to mitigating climate change. Individuals can help mitigate climate change by changing environmentally friendly behaviour, lifestyle and culture (IPCC, 2014).

In dealing with the impacts caused by climate change, 95.7% of students are willing to carry out adaptation and mitigation activities for climate change. This study's results align with the results of research (Zeeshan et al., 2021), which states that 88% of students in the Western Himalayas are willing to engage in environmentally friendly actions. The influence of this personal experience encourages students to be more responsible in protecting their environment (Fownes & Allred, 2019).

However, the study results show a difference between the students' desire to act environmentally friendly and the daily habits that students do. Table 1 illustrates that very few students make habits to reduce the impact of climate change. It is in contrast to the research conducted by (Zeeshan et al., 2021), which showed that students in India showed a higher interest in stopping plastic and replacing it with burlap. In addition, female students also showed a desire to act to manage waste compared to male students. Students in India tend to be less inclined to publish climate change information to the surrounding environment. Several studies state that students are willing to act environmentally friendly if it does not harm them personally, such as turning off lights or electronic devices when not in use. If the action requires greater effort, they are unwilling to take action, such as reducing consumption of meat and processed animal products, using public transportation instead of private transportation or reducing buying several items of clothing (Ambusaidi et al., 2012; Chhokar et al., 2012). The student's environmental friendly behaviour is listed in Table 1.

Table 1 The Student's Environmental Friendly Behaviour

The environmentally friendly behaviour	Percentage
Frequently switch off the lights while not in use.	28
Separating organic from inorganic trash	12.6
Save water	8.3
Avoid driving your car and instead take public transportation.	14.1
Eat less meat and dairy items, such as yoghurt, cheese and milk.	2.6
urging individuals to abstain from environmentally harmful actions	34.4

The findings of this study indicate that students' intention to mitigate the effects of climate change has little effect on their environmentally conscious daily behaviours. It must anticipate the disparity between student intent and actual action. However, several studies have asserted that the motivation to act directly indicates environmentally responsible behaviour (Goldman et al., 2017). In certain research, however, the urge to act only sometimes results in ecologically responsible action (Goldman et al., 2017; Lehnert et al., 2020). Several elements, including personality, history, personal experience, cultural background, family, religious, and political traditions, contribute to this discrepancy (Featherstone et al., 2009; Goldman et al., 2006). Students' ignorance of the connection between climate change action and mitigation may significantly impact their lack of awareness to act environmentally responsibly (Ambusaidi et al., 2012; Boyes et al., 2014).

Student's Attitude Toward Climate Change

A person's attitude expresses one's thoughts and feelings about a specific object (Eagly & Chaiken, 2007). Positive and negative attitudes are also possible. What a person thinks, feels, or believes about something is also considered an aspect of attitude (Barmby et al., 2008; Kind et al., 2007). This study examines the impact of climate change on people's positive and negative emotions. Hermans and Korhonen, (2017) claim that students' positive attitude is the belief in mitigation activities and the development of technology that helps lessen the impact of climate change. Students believe climate change mitigation efforts will succeed if new technology is developed. The student's attitudes toward climate change are listed in Table 2.

Table 2 The Student's Attitude Toward Climate Change

Student's Attitude	Agree	Disagree	Do not Know
I feel that climate change threatens mankind and nature	76.8	10.6	12.6
I believe that climate change is a real threat that should be treated seriously	87.2	8.2	4.6
I feel that the threat of climate change is exaggerated	36.7	31.8	31.6
I feel that climate change can be stopped	43.7	32.4	23.9
I feel that Climate change is having a positive effect on the world	61.4	18	20.6
I feel technology can help solve the existing climate change problem	67.3	11.9	20.8

Most students feel that climate change is hazardous and should be treated seriously. According to (von Storch et al., 2019), 75% of Qingdao students and 87% of Hamburg students agree that climate change severely threatens humanity.

Although almost all respondents believe climate warming damages

humanity and ecosystems, 36.7% say its effects are excessive. It agrees with (Scott-Parker et al., 2017), who says half of the respondents think climate change's impact is excessive, and others think media reports are nonsense. More pupils believe technology and science can solve climate change. According to Pettersson (2014), students are confident that science and technology will solve climate challenges. Male students exhibited more faith in science and technology to solve climate change.

CONCLUSION

The survey results indicate that most high school students in South Sumatra are aware that the majority of high school students in South Sumatra have learned about climate change via social media. More than 80 per cent of students feel the effects of climate change, which causes changes in the environment's weather, flood symptoms, decreased water quality, and the growth of vector-borne diseases such as dengue fever and malaria.

More than ninety-five per cent of students responded that they intend to engage in climate change adaptation and mitigation initiatives. However, this is different from their climate change mitigation practices. Several elements contribute to this difference, including personality, history, personal experience, cultural background, family, and religious and political traditions. This difference is likely due to a need for more awareness between climate change action and mitigation. Therefore, additional research is required to determine the causes of these differences. The climate change attitude survey results indicate that 76.8 per cent of students agree that climate change is a threat to humans and the natural world and must be taken seriously. 67.3 per cent of students feel that technology can help solve existing climate change.

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