

**Research Article**

# Gender Differences in the Attitude of Caring for Nature for Sustainable Development

Irwan Muhammad Ridwan<sup>1,3</sup>, Ida Kaniawati<sup>1</sup>, Andi Suhandi<sup>2</sup>, Taufik Ramlan Ramalis<sup>2</sup>, Achmad Samsudin<sup>2</sup>, Rahmat Rizal<sup>3</sup>, and Erwina Oktavianty<sup>4</sup>

<sup>1</sup>Department of Science Education, Faculty of Mathematics and Science Education, Universitas Pendidikan Indonesia, Jl. Dr. Setiabudi No. 229 Bandung, Indonesia

<sup>2</sup>Department of Physics Education, Faculty of Mathematics and Science Education, Universitas Pendidikan Indonesia, Jl. Dr. Setiabudi No. 229 Bandung, Indonesia

<sup>3</sup>Department of Physics Education, Faculty of Mathematics and Science Education, Universitas Siliwangi, Jl Siliwangi No. 24 Tasikmalaya, Indonesia

<sup>4</sup>Department of Physics Education, Universitas Tanjungpura, Jl. Prof. Dr. Hadari Nawawi, Pontianak, Indonesia

**ORCID**

Irwan Muhammad Ridwan: <https://orcid.org/0000-0002-5498-5437>

Ida Kaniawati: <https://orcid.org/0000-0003-2787-7892>

Andi Suhandi: <https://orcid.org/0000-0001-9912-7308>

Taufik Ramlan Ramalis: <https://orcid.org/0000-0002-7188-5673>

Achmad Samsudin: <https://orcid.org/0000-0003-3564-6031>

Rahmat Rizal: <https://orcid.org/0000-0002-7509-7180>

Erwina Oktavianty: <https://orcid.org/0000-0002-2159-3701>

Corresponding Author: Ida

Kaniawati; email:

kaniawati@upi.edu

**Published:** 26 April 2024

**Publishing services provided by**  
**Knowledge E**

© Irwan Muhammad Ridwan et al. This article is distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use and redistribution provided that the original author and source are credited.

Selection and Peer-review under the responsibility of the ICMScE Conference Committee.

**Abstract.**

The rapid development of science and technology has caused changes in all aspects of human life, including the attitude of concern for nature and human lifestyles. The purpose of this study is to describe gender differences in the attitude of caring for nature to support sustainable development. This research was conducted using a descriptive method involving 54 prospective physics teacher students at a university in Tasikmalaya, consisting of 26 males and 28 females aged 19-23 years. Data were collected by using a questionnaire on caring attitudes towards nature and a sustainable lifestyle. The collected data are processed by determining the average percentage of their answers. The results showed that the attitude of caring for nature and the sustainable lifestyle of female students was higher than that of male students. Females have an average percentage of 86.1% (high category) and males have a percentage of 82.9% (high category). Several recommendations were delivered to prospective physics teacher students, especially for the males, to effectively increase their awareness of nature and collaborate with females to promote sustainable development.

**Keywords:** Gender Differences, Attitude of Caring, Sustainable Development


**OPEN ACCESS**

## 1. INTRODUCTION

The problems of the world today are increasingly complex. Humans are faced with a critical environment, global warming, and its derivative problems. Efforts to protect the environment is the duty of the entire community, including students. Instilling awareness and a positive attitude towards the environment need to be instilled from an early age. This is because humans are the most dominant cause of natural damage and environmental pollution. Human behaviour in managing the environment at the local level contributes to environmental conditions at the global level [1][2][3]. One way to show caring behaviour for the environment is by taking care of the environment around the household where they live [4]. Materials in Earth and Space Science lectures have the potential to instil and develop a caring attitude towards the environment and encourage sustainable development. This can be seen from the concepts taught, which are close to the real problems that exist in the lives of the students, for example the floods that have occurred in various regions in Indonesia, which are caused by the lack of human awareness of the importance of caring for nature.

Destructions on Earth are caused by various factors, such as man-made disasters, including the lack of care and mistakes in the use of natural resources and spatial planning, as well as global climate change factors caused by the large amount of CO<sub>2</sub> gas emissions and other gases due to industry, fossil fuel vehicles and so on [5]. Water and air pollution in industrial and urban areas has also reached the threshold which not only endangers the health of the population but also threatens the ability to recover and the sustainability of watershed ecosystem [6]. The environmental quality index (Indeks Kualitas Lingkungan Hidup – henceforth IKLH) which consists of aspects of air quality, water quality, land quality and sea water quality shows worrying results with the last IKLH value in 2019 of 49.76 which is in the poor category [6][7]. This is due to human behaviour that prioritizes their interests over the sustainability of this planet, so that it triggers more and more natural damage.

Concern for the sustainability of nature is closely related to humans. According to the World Health Organization (WHO), disadvantaged population groups are disproportionately more exposed to environmental risk factors. Low income and poverty are the strongest determinants of increased risk. The current evidence on the impact of social factors and gender inequality on increasing environmental risk has been researched and established [8].

The attitude of caring for the environment for sustainable development questionnaire used was adopted and modified from the questionnaire that had been developed [9].

The awareness attitude towards sustainable development is divided into three indicators as shown in Table 1.

TABLE 1: Prospective teacher student attitude.

Aspect	Concern indicator	
The attitude of caring for the environment for sustainable development	1	Having awareness and gratitude for the role of the earth's atmosphere as God's creation
	2	Having curiosity, critical thinking, and care about the environment in identifying the impact of global warming
	3	Using materials that produce greenhouse gases wisely and maintaining the balance of the ecosystem in the surrounding environment

The questionnaire on the attitude of concern for sustainable development is expected to capture this. Several research results show interesting results where there are differences in attitudes between men and women in terms of the attitude of concern for aspects of sustainable development. Therefore, researchers are motivated to analyse the attitude of concern of the students in Physics education department based on gender.

## 2. RESEARCH METHOD

This study aims to describe gender differences in the profile of students' caring attitudes towards sustainable development. The research use descriptive method, involving 54 physics education students at a state university in Tasikmalaya as participants. They are students who have attended IPBA (Earth and Space Science) lectures, consisting of 26 male students and 28 female students.

The instrument used in this research is a questionnaire of caring attitude towards a sustainable future of the earth, developed by previous researchers that is valid and reliable. This test accommodates three indicators of concern, i.e. having awareness and gratitude for the role of the earth's atmosphere as God's creation, being curious, critical, and caring for the environment in identifying the impact of global warming, and using materials that produce greenhouse gases wisely, and maintain the balance of the ecosystem in the surrounding environment [9].

Data collection is done through questionnaire method. The data are then analysed to determine the average percentage of male and female student attitudes. The average percentage of concern for sustainable development for men and women will be confirmed according to the categories shown in Table 2 [10].

TABLE 2: Classification of students attitude.

Mean	Category
<48	low
48 ≥ 71	medium
≥72	high

### 3. RESULT AND DISCUSSION

The results of this study describe the attitude of male and female students towards sustainable development which includes three indicators, i.e. having awareness and gratitude for the role of the earth’s atmosphere as God’s creation; being curious, critical, and caring for the environment in identifying the impact of global warming; as well as using materials that produce greenhouse gases wisely and maintain the balance of the ecosystem in the surrounding environment. The average percentage of caring attitudes for male and female students is shown in Table 3.

TABLE 3: The average percentage of male and female students’ caring attitudes.

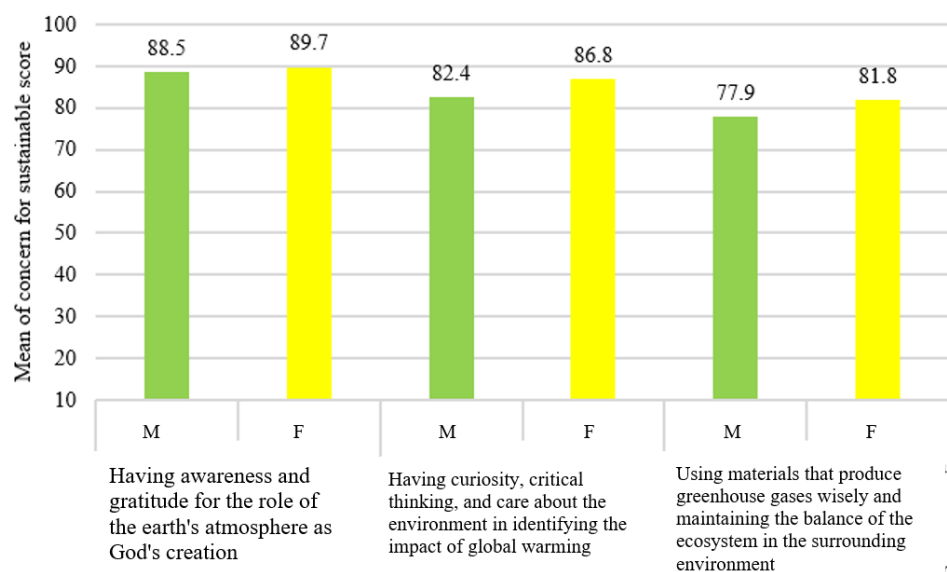
No	Gender	N	$\bar{x}$	Category
1	Male	26	82.9	High
2	Female	28	86.1	High

Based on the information shown in Table 3, it can be seen that the percentage of male and female teacher student attitudes have different average even though they are in the same category, i.e. high. The average caring attitude of male students is 82.9, while the average caring attitude of female students is 86.1. This study is in line with what was conveyed by Chen and Chileshe that women and men had relatively the same caring attitude [11] although women were found to have higher concern and desire to buy environmentally friendly products, which are ecological products, compared to men [12].

However, from the table above, it can be seen that the mean score of female students is higher than that of male students. This condition has similarities with previous research which stated that the dominance of women in their attitude of caring for the environment is very visible compared to men and even being at the forefront of caring for natural

disasters [13–15]. However, the potential of women as agents of change for climate mitigation and adaptation remains untapped. Women are figures who play a very important role in ensuring sustainable development. However, this role is still considered less than optimal because of their gender which is sometimes abandoned in policy making, including in political policy to be able to access natural resources. Whereas women are at the forefront of environmental conservation efforts. As the group with the largest number, women actually have a lot of potential to contribute to economic and social progress, also environmental protection; but their existence is unfortunately marginalized [16][17].

Women also play an important role in encouraging the integration of women’s perspectives in various policies related to global warming and climate change. Thus, women and the environment are a beautiful harmonious interaction between the wisdom of women and the best benefits of nature. Women play their roles as actors, leaders and decision makers in environmental conservation [9], although in terms of digital literacy, men are better than women [18]. This encourages men to collaborate to become good promoters of sustainability in today’s digital world. To enrich the profile of the caring attitudes of male and female students, an in-depth analysis was carried out on the specific competencies of caring attitudes towards sustainable development as shown in Figure 1.



**Figure 1:** Means of indicator concern of male and female prospective physics teacher.

In general, female students have a higher average percentage than male students in all indicators of concern for sustainable development, i.e. having awareness and gratitude for the role of the earth’s atmosphere as God’s creation, being curious, critical,

and caring for environment in identifying the impact of global warming, as well as using materials that produce greenhouse gases wisely and maintain the balance of the ecosystem in the surrounding environment. This is in line with McCright's findings. She stated that women are slightly more concerned than men about climate change, and that these gender differences are not due to differences in core values and beliefs or in the social roles that men and women play differently in society [18]. Women and the environment are a beautiful harmonious interaction between the wisdom of women and the best benefits of nature. Women in their role as humans are the closest to natural life in encouraging environmental conservation [3]. Although women are hardest hit during times of disasters because of their vulnerability caused by discriminatory practices and social norms, their involvement often proves to be the backbone of the recovery and resilience of entire communities [12, 19]. Female students have a stronger motivation to protect their environment than the males. They seem more enthusiastic, motivated, and have extraordinary perseverance.

In the indicators of having curiosity, being critical, and caring for the environment in identifying the impact of global warming, using materials that produce greenhouse gases wisely and maintaining the balance of the ecosystem in the surrounding environment, the advantages of female students are more visible than male students with maximum range of 4.4.

In the indicator of using materials that produce greenhouse gases wisely and maintaining the balance of the ecosystem in the surrounding environment, the average percentage is at least 77.9% among other indicators. Even the average percentage in the statements "I will use a bicycle/walk to campus to reduce greenhouse gases even though I have a car/motorcycle", "I use mosquito repellent spray to eradicate mosquitoes at home" and "I will use a motorized vehicle anywhere I go because it is faster" is 69%, 68% and 54% respectively. This indicates that the behavioral aspects that support sustainable development still need to be improved. This is in line with the findings which state that behavioral aspects are aspects that need further improvement in encouraging a sustainable lifestyle [5, 20–22].

The choice of travel patterns between female and male students also greatly determines the choice of using a vehicle on their way to anywhere, and differences in socialization greatly affect the choice of travel mode. In the lowest indicator, "I will use a motorized vehicle wherever I go because it is faster", female students are superior with a percentage of 60% compared to males with a percentage of 50%. Although sex and gender factors have so far not been considered when examining innovative and sustainable urban mobility compared to rural mobility, a gender sensitive perspective

is needed to increase the possibility of using sustainable modes of transportation, including encouraging environmentally friendly vehicles.

## 4. CONCLUSION

The study found that there were differences in attitudes of caring for sustainable development between male and female physics teacher candidate students. In general, it shows that female students have a more caring attitude than male students, even though the difference in mean is in a not-too-large range. Female students are superior in all indicators of concern such as having curiosity, being critical, and caring for the environment in identifying the impact of global warming and using materials that produce greenhouse gases wisely and maintaining the balance of the ecosystem in the surrounding environment, having awareness and sense of belonging, also showing gratitude for the role of the earth's atmosphere as God's creation. The implication of these findings is that it implies that men and women can work together to create an attitude of concern for the environment and encourage the creation of sustainable development.

## ACKNOWLEDGMENTS

The researchers would like to thank the Kementerian pendidikan, kebudayaan, riset, dan teknologi Republik Indonesia for the research, and publication costs.

## References

- [1] Keraf AS. Etika lingkungan hidup. Penerbit Buku Kompas; 2010.
- [2] Barnas S, Ridwan IM. "Diffraction: journal for physics education and applied physics perbedaan gender dalam pengetahuan, sikap dan perilaku mahasiswa pendidikan fisika.," vol. 1, no. 2, pp. 34–41, 2019.
- [3] I.M. Ridwan, I. Kaniawati, A. Suhandi, A. Samsudin, and R. Rizal, "Level of sustainability awareness: Where are the students' positions?," *Journal of Physics: Conference Series*. vol. 1806, no. 1, p. 2021. <https://doi.org/10.1088/1742-6596/1806/1/012135>.
- [4] Badan Pusat Statistik, *Indikator Perilaku Peduli Lingkungan.*, 2014.
- [5] WALHI. Tinjauan Lingkungan Hidup. 2017;2018:1–56.
- [6] Riafi, " (LKIP) .," no. 2, p. 2020.

- [7] Rismawati SD, Thoha IB, Sasongko SA. Geliat ecofeminisme pedesaan dalam pelestarian lingkungan (studi kasus di desa curug muncar pekalongan). *Palastren Jurnal Studi Gender*. 2018;10(1):23.
- [8] Dewi N. “Penerapan model pembelajaran berbasis masalah berbantuan mind mapping dalam program studi.,” p. 2015.
- [9] [9] H. Ani, “Peningkatan sikap peduli lingkungan melalui implementasi pendekatan sains teknologi masyarakat (stm) dalam pembelajaran Ipa Kelas Iv.1 Di Sd N Keputran, (2013).
- [10] Chen T, Chai L. Attitude towards the environment and green products: Consumers’ perspective. *Manag Sci Eng*. 2010;4(2):27–39.
- [11] Chileshe B. “The gender gap in environmental behaviour: Do Zambian women have more concern for the environment than men?” *Researchgate.Net*. no. April, p. 2020.
- [12] Foster EA. Gender and sustainable development. *Handbook on Gender in World Politics*; 2016. pp. 446–54.
- [13] McCright AM. The effects of gender on climate change knowledge and concern in the American public. *Popul Environ*. 2010;32(1):66–87.
- [14] Afriana J, Permanasari A, Fitriani A. “Penerapan project based learning ter-integrasi STEM untuk meningkatkan literasi sains siswa ditinjau dari gender.,” *Jurnal inovasi pendidikan IPA*. vol. 2, no. 2, pp. 202–212, 2016. <https://doi.org/10.21831/jipi.v2i2.8561>.
- [15] Homsy GC, Lambright KT. Beyond community characteristics: a leader’s gender and local government adoption of energy conservation practices and redistributive programmes. *Local Environ*. 2021;26(2):297–312.
- [16] Siswono A, Syaufina L, Rushayati SB. Correlation study of environmental knowledge, attitudes, subjective norms and perceptions of behavior control on students’ environmental care behavior [Science Education Journal]. *SEJ*. 2020;4(1):1–17.
- [17] Khan AM, Bin Jantan AH, Salleh LB. Z. Dato’Mansor, M.A. Islam, and S. Hosen, “The impact of transformational leadership effects on innovative work behavior by the moderating role of psychological empowerment.,” *J Rev Glob Econ*. 2019;8(December):925–38.
- [18] R. Rizal, D. Rusdiana, W. Setiawan, P. Siahaan, and I.M. Ridwan, “Gender differences in digital literacy among prospective physics teachers.,” *Journal of Physics: Conference Series*. vol. 1806, no. 1, p. 2021. <https://doi.org/10.1088/1742-6596/1806/1/012004>.
- [19] Nam S. Moderating effects of consumer empowerment on the relationship between involvement in eco-friendly food and eco-friendly food behaviour. *Int J Consum Stud*. 2020;44(4):297–305.



- [20] Kawgan-Kagan I. Are women greener than men? A preference analysis of women and men from major German cities over sustainable urban mobility. *Transp Res Interdiscip Perspect.* 2020;8:100236.
- [21] Noordin TA, Sulaiman S. The status on the level of environmental awareness in the concept of sustainable development amongst secondary school students. *Procedia Soc Behav Sci.* 2010;2(2):1276–80.
- [22] Putri MP, Liliawati W, Samsudin A, Hasanah L. “Is integrating earth and space sciences (ESS) with art contexts necessary?” In: *Journal of Physics: Conference Series.* pp. 52057. *IOP Publishing* (2019) <https://doi.org/10.1088/1742-6596/1280/5/052057>.