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Eco-literacy and Environmentally Caring Behavior for Environmental Sustainability

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ABSTRACT

Today's environment has faced serious challenges due to unsustainable human activities. Climate change, environmental pollution, and biodiversity decline are global issues that are increasingly urgent to address. In this context, it is important to understand the role of eco-literacy and socio-demographic factors in shaping environmentally caring behavior. Eco-literacy refers to an individual or society's understanding of ecosystem principles and their ability to apply this understanding in their daily lives. Eco-literacy has been identified as an important factor in raising environmental awareness, changing individual attitudes toward the environment, and encouraging actions that support the preservation of nature in maintaining environmental sustainability. One aspect to consider in the relationship between eco-literacy and environmentally caring behavior is socio-demographic factors. Social demography involves social characteristics such as age, gender, education, income, and environmental conditions in which individuals live. These factors have a significant influence on the extent to which individuals understand environmental issues, adopt environmentally caring attitudes, and engage in actions that support environmental sustainability.

KEYWORDS

Ecoliteracy; Social demography; Environmental care behavior, Environmental Sustainability

1. INTRODUCTION

The environment today faces serious challenges due to unsustainable human activities. Climate change, biodiversity decline, and environmental pollution are global issues that are

increasingly urgent to address (Al Bahij et al., 2021). Human activity to improve the quality of life through knowledge and technology has given rise to many environmental problems. These issues involve rapid population growth, significant increases in pollution, the impact of death and damage from spills and the collection of harmful substances, massive deforestation in global forests for economic purposes, environmental damage from numerous oil spill incidents, and destruction of wildlife habitat due to human development, among other issues (Gunasinghe, 2023). As a consequence, there have been many natural disasters and environmental damage that can be blamed on human activities. There is no denying that most environmental problems, both on a global and national scale, are caused by human actions (Keraf, 2013).

Human behavior is generally considered to be the main cause of various environmental problems, such as climate change, environmental pollution, and biodiversity decline (Van Basshuysen & Brandstedt, 2018). An example of human behavior that causes environmental problems is the burning incident of the Mount Bromo area, Probolinggo, East Java, Indonesia, causing forest and land fires covering an area of 274 Ha (Media Indonesia, 2023). From the phenomena, it can be concluded that humans are the main factor in the emergence of environmental problems. To overcome this challenge, it is necessary to understand how human behavior can affect the problem, either in reducing it or exacerbating it (Lange & Dewitte, 2019).

Environmental issues cannot be separated from sustainability issues (*sustainability*). Rapid population and economic growth make the importance of paying attention to environmental issues increasing (Sakti & Sukartini, 2020). In recent years, a development approach that pays attention to sustainability principles has undergone a very significant shift in its global priorities, which is evident from a major shift in focus on environmental issues. Environmental issues have attracted the attention of various groups, including the media, practitioners, academics, and non-governmental organizations, both at national and international levels (Diavano, 2022).

Steps to increase human awareness in reducing the impact of environmental damage due to sustainable human activities can be done through an education system that is accessible to everyone, both through formal and non-formal channels (Leu, 2021). One of the efforts that can be made is to build awareness of environmental literacy. Building literacy awareness through environmental education is crucial. This is key in solving environmental problems because the emphasis is not only on the destructive actions taken but also on resuscitating individuals (McBride et al., 2013).

2. LITERATURE REVIEW

2.1 Eco-literacy: Its Concept and Effects

A person/community understanding the natural environment around them, appreciating the importance of maintaining sustainability, and interacting with that environment with actions that support sustainability and are environmentally friendly is called eco-literacy (Capra, 2007). Eco-literacy is an abbreviated form of ecological literacy which is also often referred to as ecological literacy, environmental awareness, ecological literacy, and environmental literacy. In the beginning, eco-literacy was more commonly referred to as ecological awareness. However, the use of the term eco-literacy, it indicates that the concept is not only about mobilizing awareness to care for the environment but also about understanding

how ecological principles play a role in living a sustainable life together on planet Earth (Rusmawan, 2017).

The concept of eco-literacy is concerned with understanding and awareness of the relationship between humans and the natural environment. This involves understanding ecosystems, biodiversity, natural processes, and the effects that human actions have on the environment. Ecological literacy also includes an understanding of environmental issues, such as climate change, pollution, and efforts to maintain environmental sustainability (Lemons, 1992). Eco-literacy is an understanding of ecological principles and the ability to apply this understanding in everyday life. It has been identified as an important factor in raising environmental awareness, changing individual attitudes towards the environment, and encouraging actions that support environmental conservation (Sholihat, 2023).

2.2 Relationship between Eco-literacy and Environmental Awareness

Eco-literacy was found to play an important role in raising individuals' awareness of environmental issues. Individuals who have a better understanding of ecological principles tend to be more sensitive to climate change, environmental change, and ecosystem damage. They can identify links between human actions and negative impacts on the environment. Therefore, efforts to improve eco-literacy can be an important foundation in raising individual awareness of the need for environmental conservation field (Kollmuss & Agyeman, 2002). Eco-literacy reflects awareness of the importance of the environment. A person who has reached the level of eco-literacy is an individual who has a deep understanding of how important it is to care for and protect the earth, ecosystems, and nature as a place for life. With this awareness as a basis, humans regulate their lifestyles to be more in line with the environment. This awareness becomes a guide in all aspects of life, thus creating a culture that is internalized by society and ultimately resulting in a sustainable society (Rusmawan, 2017). The relationship between eco-literacy and environmental awareness is very close and mutually influential. Eco-literacy, which includes an individual or society's understanding of ecological principles and their ability to apply that understanding in their daily activities, has a crucial role to play in shaping environmental awareness (See Archives & Archives, 2020).

2.3 Eco-literacy and Changing Attitudes towards the Environment

The relationship between values towards the environment and environmentally friendly attitudes is very close because these values have an important role in shaping individual attitudes. Positive environmental values will have an impact on attitudes that support environmental conservation, and vice versa. A positive attitude is expected to encourage individuals to take concrete actions to maintain the cleanliness and comfort of the environment (Gumgum Gumelar, 2016). The results of the analysis of students' environmental care attitudes show that most of the attitudes that are owned or have begun to form in students are more influenced by the environment at school (Sandrawati et al., 2016). Eco-literacy and changing attitudes towards the environment have a very close relationship. Eco-literacy, which includes an individual's or society's understanding of ecological principles and their ability to apply them in everyday life, can serve as a trigger for changes in an individual's attitude toward the environment. An understanding of ecological principles as well as the impact of human activities on the natural environment can

influence the way individuals perceive, feel, and act on environmental issues (AR et al., 2023).

2.4 Eco-literacy and Pro-Environmental Action

Pro-environmental behavior, as proposed by Kollmus & Agyeman in 2002, refers to actions taken deliberately to reduce the negative impacts arising from human activities on the environment (Kollmus & Agyeman, 2002). Eco-literacy and pro-environmental action is closely connected. Eco-literacy which includes an individual or community's understanding of ecological principles and their ability to apply that understanding in everyday life, often triggers concrete actions that support environmental conservation (Nurfajriani et al., 2018). Data from various sources show that an understanding of the environment, attitudes, and values plays an important role in shaping a person's environmental behavior. Several studies have indicated that by increasing understanding of ecological principles, attitudes, and behaviors individuals towards the environment can experience more positive changes (Bruyere, 2008). Based on research on contributions to eco-literacy Regarding the environmentally caring behavior of public high school students in the city of Medan, the results obtained can be concluded that there is a positive relationship between eco-literacy with environmentally caring behavior in Medan State High School students. Student eco-literacy contributed to students' environmental care behavior with an R-square coefficient of determination (R^2) of 0.254 (25.4%) while the rest (74.6%) was influenced by other factors (Wahyuni et al., 2022).

Other studies on the effect of eco-literacy awareness show the value of the r-count coefficient in the r-table for a significant level of 0.05 or 5%, then $r\text{-calculate} = 0.999 > r\text{-table} = 0.576$, and for a significant level of 0.01 or 1%, then $r\text{-calculate} = 0.999$ and $r\text{-table} = 0.708$. Thus, H_0 is rejected and H_1 is accepted, which means that there is a significant influence between eco-literacy awareness and understanding environmentally friendly behavior in grade IV elementary school students. Therefore, the researchers' efforts can provide eco-literacy awareness of understanding environmentally friendly behavior in grade IV elementary school students to be applied in everyday life. This research is also important because it can be used as a new guideline in building eco-literacy awareness of elementary school students (See Archives & Archives, 2020). Based on the results of research on relationships between eco-literacy with the pro-environment behavior of junior high school students, it can be concluded that there is a positive relationship between eco-literacy and the pro-environment behavior of SMPN 45 Jakarta students (Nurfajriani et al., 2018).

2.5 Social Demographics as a Determining Factor

One aspect to consider in the relationship between eco-literacy and environmentally caring behavior is socio-demographic factors. Social demography involves social characteristics such as age, gender, education, income, and geographic location of individuals. These factors can have a significant influence on the extent to which individuals understand environmental issues, adopt environmentally caring attitudes, and engage in actions that support environmental sustainability (Patel et al., 2017).

Likewise, in 2010, Boeve-de Pauw and Van Petegem examined the environmental attitudes of young people in 56 countries. Their results show that at the individual level, the attitude

of the younger generation towards the environment is influenced by factors such as gender, socio-economic background, culture, and education level. However, at the national level, the study highlights the importance of a country's rich natural resources and the environmental issues facing the country in shaping the pro-environment attitudes of the younger generation(Boeve-de Pauw & van Petegem, 2010).

3. METHODS

The methodology in this study is an analytical literature review method or literature review to collect and analyze data from previous research sourced from journals, books, and related articles to analyze and dig deeper into how eco-literacy and factors in social demographics influence environmental behavior. The study will search relevant literature using evaluation and identification of findings, and present findings in a coherent and informative context. The selection of articles uses inclusion criteria that follow the topic of discussion.

4. DISCUSSION

The influence of eco-literacy and socio-demographic factors on environmental care behavior is an important topic in the context of environmental conservation and sustainability. A discussion of this topic helps us understand how an understanding of an individual's ecology and social characteristics can influence their behavior towards the environment. Here are some important aspects in the discussion about the influence of eco-literacy and socio-demographic factors on environmentally caring behavior:

4.1 Eco-literacy and Environmental Awareness:

Eco-literacy is proven to have a crucial role in increasing the level of awareness of individuals regarding environmental issues. Individuals who have a deeper understanding of ecological principles tend to be more sensitive to climate change, environmental change, and ecosystem damage(Kollmuss & Agyeman, 2002). Awareness of environmental issues relates to the willingness to change individual behavior(Synthia & Kabir, 2015). Eco-literacy has been shown to have a significant role in raising individual awareness of environmental issues. Individuals who have a deeper understanding of ecological principles tend to be more sensitive to issues such as climate change, environmental change, and ecosystem damage. Search results show that several studies support this view. For example, in a study conducted in Medan, it was found that high levels of eco-literacy are associated with a better understanding of students' environmentally caring behavior(Wahyuni et al., 2022).

4.2 Influence of Social Demographic Factors:

Socio-demographic factors in this study involve social characteristics, including age, gender, education, income, and environmental conditions. These factors can have a significant influence on the extent to which individuals understand environmental issues, adopt environmentally caring attitudes, and engage in actions that support environmental sustainability(Patel et al., 2017).

Age can affect caring attitudes towards the environment. Younger individuals may have lower levels of awareness of environmental issues, whereas older individuals may have more environmentally sensitive attitudes. The cognitive growth of individuals with increasing age has a significant impact in the context of eco-literacy. As a person gets older, the more likely they are to master more complex ecological concepts and understand the deeper

interrelationships between humans and the environment (Nugroho Bagus et al., 2019). The results suggest that in some cases, age can influence environmental awareness and behavior, likely due to more life experiences at an older age. For example, some individuals may initially be less concerned about environmental issues when they are younger but may experience increased awareness, especially when they begin to experience more tangible environmental impacts. Age can also influence changes in an individual's attitude toward the environment, some individuals may begin to care more about the environment as they age, especially when they feel a greater environmental impact (Nugroho Bagus et al., 2019).

While gender is one of the sociodemographic factors in environmental behavior, research has shown some differences in the way men and women respond and participate in environmental issues. Based on the results of research on gender differences in pro-environmental behaviors, women tend to engage in more basic pro-environmental behaviors than men, and the main gender differences are seen in pro-environmental choices, especially when it comes to diet, where women tend to make more environmentally supportive choices than men (Manaster, 2019). The results of testing the univariate model in research on Environmental Knowledge and Sustainable Behavior Based on Gender and Education Level showed that gender differences significantly influenced purchasing decisions for eco-friendly products and environmental knowledge (Sarkawi et al., 2017).

Individuals with higher levels of education tend to have better environmentally caring behaviors. The level of awareness of environmental problems tends to increase with increasing levels of education so that it can lead to better environmental care behavior (Sakti, 2019). Education can equip individuals with the knowledge and skills needed to make environmentally conscious decisions, such as using resources efficiently and managing waste properly (Wulansari, 2019).

Preventive actions to avoid environmental problems in the future require concrete measures that can improve environmental quality. One way is to teach caring attitudes towards the environment to children from an early age through environmental education. Environmental care in people's lives can be explained as a person's response or effort to their environment, such as protecting the environment, preserving, preventing, and improving natural conditions (Adriansyah et al., 2016). Knowledge of ecological principles obtained through environmental education can improve the ecological literacy of students (Bruyere, 2008). The factor of knowledge about environmental issues has a positive and significant influence on the intention of pro-environmental behavior of the younger generation (Harmuningsih et al., 2017).

The next socio-demographic factor is income which affects environmental care behavior and vice versa. The results showed that individuals with higher incomes tended to be more sensitive to water conservation practices (Sakti & Sukartini, 2020). Individuals with higher incomes are likely to have adequate financial resources to choose products and services that support environmental practices. This involves choices such as buying vehicles that are more energy efficient in their greener energy use to reduce carbon emissions, choosing organic products, or investing in energy-saving home technology (Synthia & Kabir, 2015).

Individuals living in slum environments may face limited resources, including time and money constraints, which can make it difficult for them to adopt environmentally caring practices that require additional investment. Individuals living in slum environments are

often more focused on meeting daily needs such as finding food, clean water, and decent shelter. Since its top priority is this essential issue, environmental issues may not get the same attention, and consequently environmentally caring behavior may be given less attention (K. Hardjasoemantri, 2013).

Individuals living in slums generally have little exposure to good or positive environmental practices, which can encourage less environmentally conscious behavior (Fitriani, 2021). This harms the quality of the environment and individual behavior towards the environment.

4.3 Environmental Care Behavior:

People who have a deeper understanding of eco-literacy are generally more aware of the relationship between human actions and their consequences for the environment. This could make them more skilled at recognizing potentially environmentally damaging behavior (Petrova, 2020).

Eco-literacy can potentially increase individual awareness of environmental issues, such as climate change, biodiversity, and pollution. With this deeper understanding, individuals can better recognize the urgency and importance of environmental conservation. For example, research on the effect of eco-literacy on students' environmental care behavior in Medan found that a high level of eco-literacy can provide a strong understanding of students' environmental care behavior field (Wahyuni et al., 2022).

Individuals who have high levels of eco-literacy are often more likely to practice environmentally conscious behaviors, such as choosing the use of environmentally friendly transportation or adopting sustainable consumption practices. An understanding of ecology can also influence individual decisions regarding transportation. More ecoliterate individuals may be more likely to use environmentally friendly transportation, such as cycling, walking, or using electric vehicles, to reduce their impact on the environment (Muniandy et al., 2022).

4.4 Education and Environmental Care:

Education plays an important role in improving eco-literacy and environmentally caring behavior. Formal and non-formal education both have a significant role in increasing eco-literacy and caring for the environment. This is by the results of research that the existence of environmental education in schools can increase students' eco-literacy competence (Noverita et al., 2022). In formal education, namely from the level of early childhood education to tertiary education, several things need to be done to improve eco-literacy, namely first, by creating a curriculum that focuses on environmental issues. Second, increasing understanding of eco-literacy through lessons using eco-literacy teaching materials can help in improving the environmentally caring behavior field (Yonanda et al., 2020). Third, namely through character education can shape the character of students who are responsible for the environment and can understand the importance of environmental ethics and concern for sustainability (Bagus et al., 2022). Meanwhile, non-formal eco-literacy education activities can be carried out through extracurricular activities in schools, campaigns, and public awareness programs such as socialization, seminars, workshops, training, and education using modern media and technology that provide information and awareness about environmental issues to the wider community field (Siti Arieta et al., 2022).

4.5 Attitude Change:

A deeper understanding of ecology and the influence of human activities on the environment might encourage individuals to take concrete actions that support environmental conservation. They may be more inclined to implement environmentally friendly practices in their daily lives (Sekaringtyas & Auliaty, 2020).

In this discussion, it is important to highlight the importance of increasing environmental awareness and environmentally caring practices in supporting nature conservation and maintaining the sustainability of our planet. In addition, understanding how eco-literacy and sociodemographic factors influence each other can help design more effective strategies to support environmentally caring behavior in different community groups.

5. CONCLUSIONS

Eco-literacy has a significant influence on environmental behavior. A better understanding of the relationship between humans and the natural environment can encourage individuals to take concrete actions to protect the environment. Socio-demographic factors such as age, gender, education, income, and living environment can influence environmentally caring behavior. An understanding of ecological principles, as well as social factors such as age, gender, education, income, and living conditions, plays an important role in shaping an individual's awareness, attitudes, and actions toward the environment. Efforts to increase environmental awareness must consider the critical role played by eco-literacy and socio-demographic factors.

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