

# The Role of Education in Sustaining Environmental Sustainability at Rural Region in Yogyakarta

*by* Nuryasman Mn

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# The Role of Education in Sustaining Environmental Sustainability at Rural Region in Yogyakarta

Kartika Nuringsih<sup>1\*</sup> Nuryasman M. N.<sup>1</sup>

<sup>1</sup>Faculty of Economics & Business, Universitas Tarumanagara, West Jakarta, 11470, Indonesia

\*Corresponding author. Email: kartikan@fe.untar.ac.id

## ABSTRACT

Supporting sustainable development is required the role of education to encourage people toward sustainability in the future. For this reason, the goal of the study is to investigate the relation of environmental education toward environmental attitude and environmental citizenship behavior (ECBs) who is perceived by high school students at Kulon Progo, Yogyakarta. As many as 215 respondents are involved in this study. The result shows the significant effect at 5 percent on the paths of analysis and proves the mediating impact on environmental attitude in linking the construct of environmental education toward ECBs. It finds a good relationship in improving ECBs for students. As a suggestion, the regional government could encourage the ECBs through collaborating with stakeholders to innovate the green campaign for sustaining the environmental sustainability at Kulon Progo. This harmony will be a mechanism to educate people, institutions, and organizations to preserve natural resources in the future.

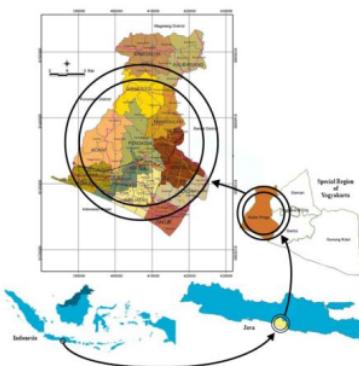
**Keywords:** Environmental education, environmental attitude, ECBs

## 1. INTRODUCTION

In line with sustainable development is required the role of education to encourage people toward sustainability in the future. Aligning with the goals of sustainable development are found the four dimensions related to environmental sustainability such as “clean water and sanitation, climate action, life below water, and life on land”. The program should be aware of the environmental issues to ensure the welfare of current and future generations. It is related to the meaning of sustainability that stated by the World Commission of Environment Development in 1987. It defined sustainability as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. Therefore, participation communities are needed to conserve natural resources for the sake of the future.

On a global scale, the Environmental Performance Index (EPI) shows the rating of the countries in achieving environmental management. It constructs some indicators e.g., clean water availability, pollution, climate change, and others. Based on the report of EPI (2020), the rate of Indonesia is 116 which means in Southeast Asia this position a far lower than Singapore, Brunei, Malaysia, and Thailand [1]. It is needed to encourage awareness among people and institutions to care about earth sustainability. Therefore, it requires an engagement of the school to arrange environmental learning. Under the mechanism, an environmental behavior will be understood early by the students so without ignoring environmental sustainability. Agreeing with the previous statement of Kollmuss and Agyeman, this behavior creates consciousness to minimize

the negative impact of human activities on nature [2]. Relevant to this issue, the study explores a model in understanding the perception among high school students at Kulon Progo about pro-environmental behavior.



**Figure 1** The administrative area of Kulon Progo

Relevant to **Figure 1**, shows one of the counties in the province of Daerah Istimewa Yogyakarta. Nowadays, Kulon Progo is located in rural areas. Moreover, the future is estimated to change rapidly as long as the development of the region. Geo-strategically, Kulon Progo is located in the middle of Java Island which is accessed by the New Yogyakarta International Airport and the southern crossing lane so that it will become the economic gateway to the region of West and North Java. It is important for

economic access, agriculture, and tourism destinations. This progress can impact people's perception of environmental conservation. Thus, it needs a mechanism to anticipate the risk of environmental sustainability. Humans must care about this issue and apply it in behavior. For these reasons, the early study promotes a model to encourage environmental education for school students.

Basically, this term is taken from the statement of "environmental citizenship" in the study of Dobson [3] which assumed changes in the behavior of individuals, institutions, and organizations are a precondition for sustainable development. According to [4] improved the concept of environmental citizenship as a form of human-nature relations with the emphasis that environmental preservation is the responsibility of everyone so as to minimize the negative impact on the earth. Similarly, Markle [5] used this term to promote environmental behavior. Further, in line with Blankenberg and Alhusen summarized determinants of pro-environmental behavior where one of the predictors is environmental citizen behavior [6]. Thus, this is a behavior that has been agreed upon by various elements of society to maintain the environment as part of the SDGs. Therefore, this study considers the term environmental citizenship behavior (ECBs) as an analogy to pro-environmental behavior. For the next discussion, both are used interchangeably.

By considering a learning process about the environment among high school students, it is hoped that it can foster knowledge that will eventually form a positive attitude towards environmental conservation. According to Bangay, school plays a role in disseminating SDGs [7]. Moreover, [8] pointed education on sustainable development aims to encourage changes in knowledge, skills, values, and attitudes of society towards sustainability. Further stated that currently, this education is arguably at the heart of the 2030 Agenda for Sustainable Development and SDGs. In line with the goals, to ensure environmental sustainability at Kulon Progo, it is necessary to provide educational support to millennials. For future generations, the attitudes towards the environment ought to form a positive effect on pro-environmental behavior.

In ensuring environmental sustainability at Kulon Progo, the tracing of the prior studies as follows. According to Schmitz & Rocha [9] concluded environmental education could improve the relationship between pro-environment attitude and knowledge among students. Highlighted the perceptions of ecological threat positively engage in pro-environmental behavior. Previously, Pawar and Rothkar [10] noted encouraging environmental awareness through forest conservation while [11] arranged environmental education activities in the forest resources conservation for the youth. Boca and Saracchi [12] noted a correlation between attitude and environmental behavior. Then, [13] stated the New Environmental Paradigms (NEP) indicators are well perceived by high school students in Turkey. Priorly, [14] proved that environmental attitude had a significant effect on the general ecological behavior of school students in Germany. Meanwhile, Palupi and Sawitri [15] described a significant relationship between

attitudes and pro-environmental behavior in Indonesia's students. In addition, [16] explained competence towards the environment, such as skills, personal motive, cultural beliefs, and environmental perception which are the forming factors for specific environmental behavior. Based on these reasons, psychological factors play an important role in the formation of behavior so that the role of schools is needed to foster environmental behavior in students.

This conceptual mechanism is in accordance with the perspective of planned behavior theory that a person's behavior is formed by intention where the formation of intention is influenced by attitude. Therefore, a person's attitude towards the environment can influence behavior towards the environment. Finally, the most important effort in building concern for the environment is through attitude. Environmental education will shape attitudes towards the environment so that the school community's concern for the environment is formed. These behavioral changes occur at the individual, institutional and organizational levels so that in the future the ECBs will be formed.

The role of the study is to analyze the relationship between environmental education, environmental attitude, and ECBs and to create some suggestions for the regional government to improve the mechanism through education institution supporting. Three hypotheses are developed from these relationships by accentuating the mediating effect of environmental attitude to link environmental education to ECBs. The novelty is to examine NEP indicators in the context of school students in rural areas so that current policies can be developed to promote environmental behavior so that students more understand realizing these expectations.

## 2. METHODS

The population consists of senior high school students of SMA 1 Wates Kulon Progo with involving as many as 215 students from the final class (XII) as respondents. It is the legend of the school with respect to the education program at Kulon Progo. The convenience sampling method is used to collect respondents. The study constructs the relationship among variables by positioning ECBs as endogenous variables while this attitude as a mediating variable to link environmental education to ECBs.

The designing of constructs consider some previous studies such as (1) environmental attitude includes 15 indicators adopted from "New Environmental Paradigms (NEP)" in the study of Atav et al. [13]. (2) environmental behavior adopts the "Environmental Citizenship Behavior (ECBs)" includes 6 indicators in the study of Blankenberg and Alhusen [6]. (3) environmental education refers to study of Gao [17] by including "conceptual knowledge, environmental value, and action skill".

Entirely indicators were arranged in the questionnaire and to be installed to the google form using a Likert scale from 1 (not very agree) until 4 (very agree). Respondents filled out the questionnaire themselves. A Smart-PLS was run to analyze the regression approach. For ensuring the reliability of the entire instruments selected the output of

composite reliability meanwhile to measure the validity of indicators were used the scores of factors loading.

### 3. FINDINGS AND DISCUSSIONS

#### 3.1. Respondent profiles

As many as 215 students of SMA 1 Wates are selected as respondents consisting of 65% of female and 35% of male students. Most of the participants (72%) from science while others from social science classes. Specifically, 87 students stated that they had participated in the environmental campaign in the last two years, inversely 128 students have not participated. However, 88% participated in environmental activities organized by schools such as tree planting, medicinal plants, plastic diet campaign, clean Friday, social service, sorting waste, and reforestation at the side of the Progo River. To motivate

the participation among students in environmental action, it is necessary to involve alumni collaborations with other partners such as environmental service, corporate social responsibility (CRS) programs, artists, Non-Government Organisations (NGOs), or tourism villages at Kulon Progo.

#### 3.2. Testing of validity and reliability

**Table 1** shows the indicators of ECBs and environmental education in valid and reliable conditions for measuring the constructs. This can be seen from the score loading on each major indicator above 0.60. The highest score is 0.748 which proves the majority of respondents understanding about protecting natural activities. However, the indicators of education get a higher score. Also, the resulting composite reliability score is above 0.80 so that both are declared reliable. The accuracy of values can be cross-checked through t statistical value.

**Table 1. Validity and Reliability Instruments**

Code	Environmental Citizenship Behavior	Loading	T-stat.
ECB1	“Attending events/meetings that discuss environmental activities”	0,69542	9,33984
ECB2	“Spreading knowledge about the environment to others”	0,73548	8,01559
ECB3	“Protecting natural activities”	0,74774	11,71081
ECB4	“Reading articles about the environment”	0,62660	5,68597
ECB5	“Educating yourself to care for the environment”	0,66159	6,09764
ECB6	“Participating in environmental discussions through social media”	0,59796	4,54255
Composite reliability: <b>0,83654</b>			
Code	Environmental Education	Loading	T stat.
ENDU1	“School teaches how to preserve the environment and its impact on society, schools and individuals”	0,89429	29,74017
ENDU2	“School teaches environmental values and the meaning for the sustainability of human life and the natural surroundings”	0,90558	37,35257
ENDU3	“School teaches solutions to solve environmental problems, for example: planting trees, the 3R movement, sorting waste, saving energy, plastic diets or other green behaviors”	0,87565	25,86799
Composite reliability: <b>0,92107</b>			
Code	Environmental Attitude	Loading	T-stat.
EAT1	“Natural damage can be anticipated through environmentally friendly practices”	0,51621	5,19204
EAT2	“If not properly maintained, nature will suffer damage”	0,37729	2,36035
EAT4	“Plants and animals have the same rights as human existence”	0,54803	3,97158
EAT5	“Environmental destruction will bring natural disasters/calamities”	0,53830	3,39865
EAT6	“As a human being, the experience of dealing with natural disasters is a valuable lesson”	0,54161	4,25945
EAT9	“Regardless of human abilities, humans are still subject to natural laws”	0,38369	2,87819
EAT11	“The number of people on earth is approaching the maximum limit”	0,34792	2,37181
EAT13	“We should be responsive to natural phenomena”	0,77674	12,75468
EAT14	“Humans are responsible for creating the earth as a suitable place for all life”	0,69401	7,39807
Composite reliability: <b>0,77835</b>			

Conversely, it calculates that the environmental attitude indicator decreased by five items because it resulted in a low outer loading score. In addition, the three indicators produce relatively low outer loading values (**#EAT-2, #EAT-9, #EAT-11**). However, the score of cross-loading on these indicators is greater than the other two constructs so that can be maintained as indicators of environmental attitude. The highest score is 0.777 which proves the most respondents have the same perception about this item. The results also show the composite reliability score exceeds 0.70 so that it is declared reliable. The result also illustrates that not all of NEP's indicators are accurately applied to various communities.

**Table 2** shows the path coefficient between environmental education and attitude of 0.399 or a significant 1%. These results indicate that the first hypothesis is accepted so that there is a significant relationship between environmental education and environmental attitude. Furthermore, the environmental education path coefficient with ECBs is 0.246 or 1% significant. This shows that the second hypothesis is accepted. Finally, it proves that the path coefficient between environmental attitude with ECBs is 0.372 or 1% significant so that the third hypothesis is not rejected. Based on this result, environmental attitude is able to mediate the relationship between environmental education and ECBs among students' perception.

**Table 2 Path Coefficients**

Path	Original Sample	Standard Error	T Statistics	Hypothesis
ENDU -> EAT	0,39856	0,09266	4,30124	H1
ENDU -> ECB	0,24630	0,12092	2,03693	H2
EAT -> ECB	0,37155	0,11982	3,10086	H3
$R^2$ EAT: 15,90%		$R^2$ ECBs : 27,18%		
$F^2$ EAT : 13,74%		$F^2$ ENDU : 6,32%		
$Q^2$ EAT : 5,62%		$Q^2$ ENDU : 2,14%		

Furthermore, the contribution of environmental education to environmental attitude is **0.1590** ( $0.39856 \times 0.399^*$ ). This means that if there is an increase in environmental education activities, it will increase students' attitudes towards the environment by **15.90%**. It is the same as the  $R^2$  value, so it means environmental education has a contribution to the environmental attitude of 15.90%. Likewise, the contribution of environmental education to ECBs is **0.0970** ( $0.246 \times 0.394^*$ ) so that if there is an increase in environmental education activities, it tends to increase ECBs by **9.70%**. Furthermore, the contribution of environmental attitude towards ECBs is **0.1748** ( $0.372 \times 0.469^*$ ). This means that if there is an increase in attitude towards the environment, it will increase the ECB's by **17.48%**. The size of the two constructs' contribution to the ECBs was **27.18%** ( $9.70\% + 17.48\%$ ) or equal to a score of  $R^2$  on the ECBs. As information, the sign (\*) in these formulations are calculated from the value of the correlation between both variables. Lastly, the score effect size ( $F^2$ ) and predictive relevance ( $Q^2$ ) tend to be low so that to foster the behavior of high school students at Kulon Progo is needed for other mechanisms. The influence of education is stronger relatively in developing attitudes so that creative ways are needed to form students' character which is the care with environmental issues.

### 3.3. Discussions

In line with the progress of the "Millennium Development Goals (MDGs)" in 2000, the discussion of environmental psychology began to be widely carried out. One year

before the moment of the MDGs, the relationship between environmental attitude and ecological behavior was predicted [18]. Even, pro-environmental behavior was also defined and elaborated various indicators [2],[19] then, the dimensions develop in aligning with people's lifestyle. Similarly, the study of [5] arranged the dimensions including conservation, environmental citizenship, food, and transportation. Then [20] improved the shopping behavior as a dimension of this behavior. Further, the study of ECB's at Kulon Progo serves as an initial description of how schools are involved in introducing and habituating green behavior to students in order to support sustainable development programs. Thus, it needs to be introduced through a more attractive approach to students

Basically, education aims to improve individuals with abilities and talent development so they can overcome life's challenges. Through education, students gain knowledge, environmental value, and acting skills so that they are expected to maintain the environmental sustainability. Education encourages creativity and innovation in order to find solutions for the future. According to previous studies [7] [8] [17] that schools have a role in introducing the concept of environmental sustainability or sustainable development so that it increases knowledge and stimulates creativity for students. This result is in line with [9] [10] [11] that various ways of environmental education can form a positive mindset towards the environment in students. Environmental education has an effect on ECBs even though this effect is smaller than the environmental attitude. It is also proven that environmental attitude has a significant effect on

ECBs. This indicates that the environmental attitude encourages environmental awareness among students. This relationship is in line with [12],[14],[15]. However, many psychological factors influence environmental behavior such as skills, personal motives, cultural beliefs, and environmental perception. The role of schools is important in exploring mechanisms that are in accordance with the natural wealth and local wisdom at Kulon Progo.

Although in a simple manner, school activities contribute to introducing environmental sustainability at Kulon Progo. If evaluated from the aspect of validity, the last ECBs' indicator (#ECB6: "Participating in environmental discussions through social media ...") has the lowest loading value compared with others. Thus, creativity is needed through social media e.g., Instagram, Facebook, YouTube, or others to produce an innovative educational model. Moreover, aligning with the development of sustainable tourism, it demands harmony with people's behavior. An innovative manner can be created by synergizing among social media, green behavior, and local destination so that can improve students' participation in the current issues.

Aligning with the theory of planned behavior (TPB) was illustrated that environmental education can form an environmental attitude that ultimately forms an intention towards environmental sustainability and ECBs of students. Environmental education programs need to be a routine agenda for governments so that in the future the millennial has awareness of preservation which ultimately contributes to sustainable development. It is hoped to become a new lifestyle for millennials. Based on these reasons, further suggestions are as follows:

A program can be empowered to cultivate attitudes through turtle conservation. At several locations along the southern coast of Kulon Progo such as Jangkaran, Bugel, Trisik, there are turtle habitats that need to be protected by the government. The same potential also occurs on the southern coast of Bantul Regency which has been utilized as turtle conservation at Cemara beach. The coastal community has been given awareness of the conservation of turtle habitat so that when they find turtle eggs they will be handed over to the conservation area. This activity is environmental education by involving society and students so that an environmental campaign is carried out simultaneously with the release of hatchlings (baby turtles). The same opportunity can be done on the south coast of Kulon Progo so that the turtle habitat can be preserved. Moreover, the southern of the region is bordered by the Indian Ocean so that it needs education for the coastal community. One upon a time on the coast, a whale shark washed up on September 19, 2020, but unfortunately, the shark was rescued too late so that it could not return to the sea. The whale shark is a species of tame shark that is protected by law, so eco-based education is very important to be introduced to students. Hence, a collaboration among environmental service, education & culture office and CSR can be carried out to pioneer turtle conservation as well as promoting green behavior in coastal areas.

Another approach can be developed through sustainable agriculture. As an agricultural society, the majority of

Kulon Progo people's life is supported by the agricultural sector, so eco-friendly agricultural innovation is needed. For instance, creativity has been pioneered by a farmer group at Gledeg Village, Karanganom Sub-district, Klaten Regency by raising Tyto Alba owls as predators of rats. Owls are provided the permanent nests in the paddy field areas. Through a village regulation, a ban on catching owls is regulated as well as other prohibitions such as electrocuting fish, eels, and frogs and throwing garbage in the river, including human waste. This practice can serve as inspiration so that this approach can be adopted by the government to the farming community as well as improving knowledge for millennials.

Another model can synergize tourist villages to conduct environmental campaigns while promoting destinations. The county has ten tourist villages, namely "Banjarmoy, Nglingsgo, Kalibiru, Purwosari, Banjarsari, Sermo, Sidoharjo, Sidorejo, Jatimulyo, and Purwoharjo". Located in the Menoreh Mountain areas, it is known as Menoreh Tourism with the some familiar destinations e.g., Waduk Sermo, Kalibiru, Pule Payung, Kedung Pedut, Mudal River, Nglingsgo Tea Plantation, and Suroloyo Peak. Destinations can be involved as locations for environmental care activities through photography competitions, writing scientific papers, videos, or vlogs that school students participate in these events. One of the tourist destinations in the mangrove forest so that eco-friendly activities through mangrove planting are used to prevent abrasion. Similar activities are carried out by planting trees or local fruits which are becoming scarce in the region. In addition to being useful for reforestation, activities are also useful for plant conservation.

By collaborating with the alumni, a seminar event should be held to introduce regulation, energy/resource saving behavior, consumption patterns, and safe use of materials for the environment. The new information is important to inform school students e.g., reducing waste production (zero waste innovation), energy conservation, recycling, social conservation, transportation and mobility, waste avoidance, and consumerism prevention. The ecology-based educational approach is suggested to increase knowledge for students so that it can have a positive impact on the environmental attitude which ultimately encourages environmental behavior among students.

Lastly, alternative socialization can be harmonized with the entrepreneurial sector, where one of the models in entrepreneurship is through eco-entrepreneurship. Not many high school students understand this business model so that efforts to increase knowledge and attract students' interest in eco-entrepreneurship are carried out by creativity in introducing the business. Collaborating with the alumni, a business plan competition with the theme of green business can be held in the future. This activity increases students' knowledge of the latest issues about green behavior, green business, and green tourism so that it enriches their iteration and is ultimately interested in implementing various alternative activities. It encourages sustainability awareness among young people.

To realize this idea, it cannot be stand-alone but requires support from the government and stakeholders as social

support. This collaboration will be suitable for the theory of planned behavior while the social norm is one of the antecedents of intention. Commonly, it can be concluded that stakeholder collaboration in socializing regulations, green campaigns, and pro-environmental behavior events will form social norm as well as foster self-confidence in high school students so that have a perceived behavior control to carry out the activities. Considering with two aspects, if synergized with environmental attitude, both will encourage people's behavior towards environmental sustainability. Mutual agreement among individuals, communities, organizations, and governments to carry out activities that can reduce negative effects on the future of the earth will form behavior in harmony with ECBs. It is in line with the SDGs so that to be developed as a mechanism to ensure environmental sustainability.

Related to the United Nations Agenda 2030, we need the time in nine years to pursue the realization of SDGs. This study connects some aspects <sup>4</sup> of the goals of sustainable development, for instance, clean water and sanitation, climate action, life below water, and life on land. If life on land is done properly, it will have a positive impact on the quality and availability of clean water or maintain the living sustainability in the sea. It will reduce the risk of climate change. To achieve these goals must be supported by an education system. In line with [12] explained some statements of environmental education (ED), as follows (1) ED in the environment, (2) ED for the environment, (3) ED about the environment, and (4) ED to the environment. Compared with these results so the process to create some suggestions for the regional government at Kulon Progo is elaborated suitable with the kinds above.

#### 4. CONCLUSION

The results conclude that environmental education has a positive influence on environmental attitude and ECBs in high school students at Kulon Progo. The results also prove that environmental attitude can mediate the relationship between environmental education and ECBs. Currently, Kulon Progo is predominantly located in rural areas but is expected to develop rapidly in line with regional development. To effort to maintain environmental sustainability, an innovative model of socialization is needed for students at Kulon Progo. The role of the education sector is important to ensure environmental sustainability in the county and its surroundings. Through education will foster attitudes and behavior towards the environment. The agreement of individuals, communities, organizations, and governments can reduce the negative effects on the earth, so it will be in line with ECBs and support sustainable development. It is as a mechanism to pursue SDGs Agenda 2030.

As a suggestion for local governments, it is necessary to increase environmental education programs by involving the roles of schools, governments, and stakeholders to develop innovative environmental campaign models that in line with millennial passion. The education is adjusted to the natural potential and social life of the community

and is carried out through approaches and themes that are attractive to students. Besides, various programs that have been implemented effectively from neighboring regions can be considered to be adopted to provide knowledge to students and educate the community.

This study produces a significant model in understanding ECBs so the avenue for further studies can drive a sense of the green business among high school students. This is in line with the entrepreneurial learning program that is being promoted by the government. Besides that, it could be as the insight for the millennial high school students.

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