

# Does Green Curriculum Have an Impact on Pro-environmental Behavior?: A Comparative Study with Middle Schools

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**Abstract:** Pro-environmental Behavior is a factor that is most important in explaining humans' initiative to conserve nature. One of the most effective and widely used ways to ensure that individuals develop pro-environmental behaviour is to implement environmental knowledge through education. However, in Indonesia, it has never been researched whether or not such specific nature-based curriculum schools really do implement environmental education better than the general-based curriculum counterpart. This research will focus on measuring how effective each school's curriculum in implementing their environmental education by comparing the mean score between the two groups. Theories related to pro-environmental behaviour such as the VBN model and *nature relatedness* are used as the main reference to compare how effective schools implement their environmental education to their students. This is a quantitative research that compares between the two groups using the independent sample t-test method. This research has discovered that the overall mean score of the participants are good. From these findings, it was discovered that from all the variables that are examined there are three distinct variables, which differ significantly from each group, that is variables *ascription of responsibilities*, *personal norms* and pro-environmental behaviour. It is found that pupils who attend a general-based school curriculum have a significantly higher score in *ascription of responsibilities* and *personal norms* compared to pupils who attend a nature-based school curriculum. In addition to that, pupils who attend a nature-based school curriculum are proven to have a significantly higher score in Pro-Environmental Behavior compared to pupils who attend a normal-based school curriculum. This research has found that students who attend nature-based curriculums do significantly behave more pro-environmentally compared to their general-based curriculum counterpart. But, not that do not excel in every variable which corresponds to pro-environmental behaviour.

## 1 INTRODUCTION

Human beings and their environment are two inseparable elements (Leopold, 1949). There exists interrelation between human and their surroundings including all the living things since the birth of humankind. The interrelation is materialised in both physical and material dependence, and dependence in other aspects, such as esthetics, intelligence, cognitive, spirits, and satisfaction. This type of interrelationship is known as *biophilia hypothesis*. *Biophilia hypothesis*, introduced by Kellert and Wilson (1993), suggested that the interrelationship between human and the environment is beyond the exploitation of the environment for the benefits of the mankind. The interrelation exists to establish connections and existence with their environment. As a matter of fact, the nature has provided priceless

contribution to the existence of the human being, particularly in the long taking human evolution process so that, substantially, the human will always be dependent to the nature considering their characteristics developed since their birth. However, along with the technological development, the form of dependence has shifted from natural dependence to indirect one, which materialised through technology. The deterioration of natural dependence will provide adversely impact to the quality of interrelation of the human and the nature that was previously achieved in many aspects such as materials, affection, cognition, and evaluations (Kellert & Wilson, 1993). Therefore, in order to maintain the existence of the human being, it is very important to create strategic and long-term initiatives aiming at reviving harmonic relation between the human and the nature.

The development in technology and civilization has brought a progressive urbanization so that quality of interaction between human and their nature has been decreasing significantly (Baiquni, 2015). Demographically, the urbanization indicates the shifting of the living mechanism in the society. In the early period of civilization, the society was heavily depending upon the agriculture sector and the interaction with the nature was very intense. Currently, people at majority make a living on industrial activities, which are based on manufacturing technology. The urbanization has decreased green area in the urban areas and the living style has adversely impacted to the exploitation of the nature, which result in higher pollution and natural destruction (Baiquni, 2009). Subsequently, the people have lower awareness to the nature and tend to commit environmentally unfriendly activities such as littering and using environmentally unfriendly transportation modes, and etc. (Baiquni, 2015). Therefore, it can be inferred that the gap between the human and the environment could potentially develop adverse behaviors that disbenefit the human.

Kurisu (2015) stated that the gap between human and the environment would provide adverse impact to the nature. For example, a lack of awareness of the people to the environmental issues has contributed to the global warming, climate change and the extinction of certain species in many parts of the world. Another closer example of environmental destruction is the decrease of the tropical forest in Indonesia. The destruction intensely happened in the period of 1990 to 2003 where 16 million acres of tropical forest has gone into extinction through illegal logging. ("TahukahKamu", 2017).

Most of the environmental problems immersed because of irresponsible actions, which were not anticipated by preventive actions (Soerjani, YuwonodanFardiaz, 2007). The most contributing factors to the environmental destruction globally are addressed to irresponsible actions which are not only polutive to the environment and its creatures, but also hazardous to the human being. Henceforth, it is important to identify the affecting factors to the development of pro-environmental behaviour.

A number of efforts have been initiated to certain elements in the society to improve pro-environmental behaviour. One of the approaches that is considered effective in reshaping the attitude of the people towards the environment is the intervention into education system (Palmer & Neal, 2003). Induction of pro-environmental values into school education system is one of the modes

(*Environmental Education*). Environmental education is an introduction process of values and concepts to develop skill and preference, which appreciate harmonious interrelation between human, culture, and their biophysical environment. The International Workshop on Environmental Education (IIEP) has concluded that the environmental education has three objectives: promoting the awareness towards the state of interrelationship among the economic, social, political and ecological factors in urban and remote areas; providing fair chance to everybody to absorb knowledge, values, attitude, commitment, and skills required in preserving the environment; and, reshaping the ecological preference individually as well as community based. The schools are delegated to develop their system to develop their implementation program.

Currently, the Indonesian education system run their education program based on the principles of 2013 national education program which emphasis on holistic approach. The holistic approach is a method for education that does not separate the knowledge into several sub programs. There are three elements that the government wants to emphasize such as *standard-based education*, *competency-based curriculum*, and *mastery learning*. Assessment and the education serve as the parameters in achieving minimum standards. Henceforth, some education methods were developed to facilitate education process and gain the success in a more systematic way (personal communication, March 25, 2018). In Indonesia, there exist nature-based schools that innovatively develop environmental based education. Nature based school specifically design the curriculum which allows the students to improve their knowledge and to get direct interaction with the nature whilst studying basic knowledge. The students are taught basic knowledge in the nature so that they can conduct environmentally friendly activities and promote willingness of the student to do their activities with the nature.

Teenagers are considered the most potential assets in every country. In Indonesia, the teenagers (with the age ranging from 10 to 15 years old) acquires 32.2 percent of the total populations (8.442.932 persons) in 2016 (Kementerian Pendidikan dan Kebudayaan, 2016) and it is expected to increase until 2030 (BAPPENAS and LembagaDemografi FEB UI, 2017). Taking the intensity of current environmental problems, the investment in the education system to improve the awareness of pro-environmental behaviors in really important.

Well-designed pro-environment education system is expected to produce new generation who are environmentally friendly as one of the distinctive features and they have potential to develop their countries and the world. However, no research has been conducted to observe the behavioural dynamics of the teenagers. This research is conducted to fill up the knowledge. The adoption of values mostly takes place during the teenage years (Kahn & Kellert, 2002). It is essential to identify the key success factors in developing awareness for pro-environment behaviour since the current teenagers will shortly replace the position of current adults who make strategic decisions. Through proper execution of education program, it is expected that pro-environment society would be able to bring down the destruction rate to the minimum.

As it was mentioned earlier, during the teenage period, every individual dynamically is in the search period and it will be concluded by the internalising period which leads to the final character determining daily behaviour (Kohlberg, 1969 dalam Papalia & Martorell, 2015). The school system may, in fact, serve as a center, which compile and share experiences of teenage life since the schools offer a fair chance to gain information and vocational skills (Papalia & Martorell, 2015). School serve as the first external circle after the core family where the students spend considerable portion of their time in life. The students learn and adopt new academical and non-academical information and skills from the school. That explains how the information shared at school may significantly affect the character and behaviour building of the students (Nanne, et al., 2013). This research was conducted to observe different characters were built due to different education programs which one of those emphasises the environmental aspect whilst the other not.

Theoretically, pro-environmental behaviour is affected by a number of factors. Stern (2000) offered a VBN (Value, Belief, and Norms) model that is capable of explaining the building of pro-environment behavior. This theory explains how value that relates an individual to the values and how that relation would build confidence on how those values need to be preserved and conserve. Besides values and beliefs, according to the VBN model, pro-environment behaviour would also be affected by individual norms and public expectation by the surrounding relating to how things can be done (Stern, 2000). A number of researches have indicated the ability of VBN model to explain pro-

environment behaviour, which based on individual values, beliefs and norms.

Besides the VBN model proposed by Stern (2000), Nisbet and Zelenski (2009) proposed a predictor showing the level of Nature Relatedness, which describes successfully pro-environment behavior. Nature Relatedness is a theoretical framework, which explains individual relatedness, which is developed on the basis of individual perception and his personal experiences with the nature. (Nisbet & Zelenski, 2009). This research aims to compare the mean score of variables that form pro-environmental behaviour and pro-environmental behaviour to see whether or not students who attend schools which a nature-based curriculum do score better than students who attend a general-based school curriculum.

## 1.1 Pro-environment Behavior

Pro-environment behaviour is a behavioral pattern of an individual when conducting beneficial and non-beneficial daily actions based on the same intention (Stern, 2000). Stern (2000) also defined pro-environment behaviour or environmentally significant behaviors as an impact oriented behavioural pattern and intent oriented. Impact-oriented behavior is referred more intensely on how the human behaviour could provide impacts to the availability of materials and energy from the environment or how the behaviour could provide impacts to the dynamic structure of the ecosystem or the biosphere. Whilst, intent oriented definition is based on behaviors as an autonomous factor provide direct impact to the environment (Stern 1997 in, 2000). The main differences between the two approaches are on impact and the motives. Subsequently, with the intent-oriented approach, one will be able to comprehend the process and how to do intervention in order to reshape the behavioural patterns. Stern (2000) classified pro-environment behaviour patterns into four types and identified the discriminating factors. The first type is the environmental activism that explains how an individual involves with meaningful activities to his environment and surroundings. The second type is the nonactivist behaviors in the public spheres identifying individuals who are supportive to the environmentally supportive activities. The third type is the Private sphere behaviors and the last type is the behaviors in organizations.

## 1.2 Value-Belief-Norm Model

Value-Belief-Norm model is a theoretical framework used to understand the dynamic of the pro-environment behavioural development (Oreg & Katz-Gerro, 2006). The theory argues that pro-environment behaviour emerges from individual values, which then activates his beliefs that certain things may threaten his values, and for him to active anticipatory actions (Stern, 1999). The VBN theoretical framework relates the theory of value to the *norm-activation theory* (Stern, 2000). Stern (2000) has developed the *value-belief-norm* (VBN) theoretical framework to further elaborate the relationship between values and pro-environment behavior. The VBN model involves six main variables i.e. Values consisting of hedonistic, egoistic and biospheric values; Belief described by the New Environmental Paradigm, Awareness of Consequences dan Ascription of Responsibility; Norm which represented by Personal Norms. Those six main variables collaboratively trigger the pro-environment behaviour.

## 1.3 Nature Relatedness

Nature relatedness refers to a psychological construct that is capable to capture the uniqueness of the individuals in perceiving their relation with the environment (Nisbet et al., 2009). The concept defines three attributes addressing the relationship with the nature including: (1) NR-self as the attribute which captures affective relationship to the nature, established through thoughts and feelings; (2) NR-perspective as the attribute representing the cognitive relationship relating to the impact of the human acts to their surroundings; and (3) NR-experience as the attribute describing individual physical relationship to the nature established through physical comfort which trigger an aspiration to be a part of the nature physically. Nisbet (2009) proposed nature relatedness as a term to describe relationship between human and the nature regardless he was comfortable or not to be around his natural surroundings. By definition, NR (Nature Relatedness) is the affective and cognitive aspects and also experiences relating to the relationship between human and the nature (Nisbet in Environmental Behavior 41: 715 – 740, 2009)

## 2 METHOD

This research focuses on examining whether or not pupils who attend nature-based curriculum schools and general-based curriculum school really have distinctive mean scores in variables related to pro-environmental behavior. The pro-environment behaviour is inferred from the total score calculated from the General Environmental Behavior for Adolescence (Kaiser, Oerke & Bogner, 2007). The higher the score of the pro-environment behaviour, the friendlier the person is to the environment. The VBN model which includes factors that shape pro-environmental behaviour is measured by five variables i.e. biospheric values, new environmental paradigm, awareness of adverse consequences, ascription of responsibilities and personal norms.

Pro-environment behaviour is measured by using an adapted unidimensional General Environmental Behavior for Adolescence (Kaiser, Oerke & Bogner, 2007), and variables that forms pro-environmental behavior, which consists of biospheric values, new environmental paradigm, awareness of adverse consequences, ascription of responsibilities and personal norms. The nature relatedness variable is measured by using the adaptation of Nature Relatedness Scale (Nisbet & Zelenski, 2009), which has been translated into Bahasa Indonesia. It uses the six-point likert scale from 1 (least preferable) to 6 (most preferable). The measuring tools of the nature relatedness consists of 21 items.

General Environmental Behavior for Adolescence (Kaiser, Oerke & Bogner, 2007) consists of 20 items. Out of the 20 items, 3 items are used to measure the level of energy conservation, 2 items to measure mobility dan transportation, 3 items to measure waste avoidance, 3 items to measure recycling preferences, 3 items to measure level of consumerism, and 7 items to measure Vicarious Behaviors toward Conservation. Scale of General Environmental Behavior for Adolescence is adapted into Bahasa Indonesia and transforms into Likert scale. The scale is ranging from 1 (least preferable) to 6 (most preferable).

This research is classified as a quasi-experimental since the research identified different responses based on different treatments to two different groups that have received a considerably different treatment in regards to the application environmental education. Based on the data compilation method, this research is considered as a quantitative research since the data in acquired from the participants in term of numerical scores so that statistical procedures are applicable (Kumar, 2011).



The participants of the research were junior high school students with ages between 11-15 years old of the public schools and nature schools. The number of the respondents is 415 students. The sample selection method is using *non-probability sampling*. The selection method is chosen because initially the exact number of total number of 12 grade students so that individual approach was not preferred (Kumar, 2011).

Data compilation was conducted offline so that the data compilation process can be conducted to reach as many possible participants at one time. The use of questionnaire is preferred so that all the response was made accurately in accordance with the instructions. The questionnaire was used as research instruments that were used after the validity and reliability was assured and the language was transferred into Bahasa to ease the communication.

The research applied certain statistical techniques for processing the data such as 1) *Confirmatory Factor Analysis* (CFA) used to obtain valid and reliable indicators of each variables which consists of *The Nature Relatedness Scale, A Brief Inventory of Values, The New Environmental Paradigm, Awareness of Adverse Consequences, Ascription of Responsibilities, Personal Norms dan General Environmental Behavior for Adolescence*; 2) descriptive statistic analysis to obtain general descriptions including frequency analysis, obtaining mean, min-max values and deviation standards; 3) *Pearson Correlation* analysis to obtain interrelation between variables, and; 4) *Independent Sample T-Test* to observe differences among variables based on the types of schools.

### 3 RESULT

There were a total of 415 participants that agreed to be a part of the experiment. In which 52.8% of the participants originated from the nature-based curriculum school, while 47% of the participants originated from a general-based curriculum school. In this research, we have found two important findings.

As shown on the table, participants who attended a nature-based school has scored better than participants who attended a school with a general-based curriculum on biospheric values and pro-environmental behaviour. Meanwhile, participants who attended a school that uses a general-based curriculum have been found to have obtained a higher score in variables nature relatedness, ascription of responsibilities, personal norms and new environmental paradigm.

Table 1: Means and standard deviations of the variables

Variables	School					
	Nature-based			General-based		
	Mean	S D	Freq	Mean	S D	F r e q
Biospheric Values	4.98	.65	219	4.89	.71	196
Nature Relatedness	4.04	.60	219	4.14	.57	196
Ascription of Responsibilities	5.04	.72	219	5.22	.70	196
Awareness of Adverse Consequences	5.00	.68	219	5.00	.76	196
Personal Norms	4.61	.72	219	4.87	.70	196
New Environmental Paradigm	2.72	.78	219	2.77	.86	196
Pro Environmental Behavior	3.24	.57	219	3.08	.68	196

Second is that using the independent sample t-test method, this research has found three distinct variables that has a significant mean difference between the nature-based school curriculum group and the general-based school

curriculum group. These variables included are: ascription of responsibilities, personal norms and pro-environmental behaviour. In which, for variables ascription of responsibilities the general-based school curriculum group had a mean score that is significantly higher compared to the mean score of the nature-based school curriculum. Whereas for the pro-environmental variable, the nature-based school curriculum group had a significantly higher mean score compared to their general-based school curriculum counterpart.

Table 2: Independent sample T-test of each variables

Variables	t	Significance	df
<b>Biospheric Values</b>	1.285	.199	413
<b>Nature Relatedness</b>	-1.730	.084	413
<b>Awareness of Adverse Consequences</b>	-.036	.971	413
<b>Ascription of Responsibilities</b>	-2.628	.009*	413
<b>Personal Norms</b>	-3.693	.000*	413
<b>New Environmental Paradigm</b>	-.524	.601	413
<b>Perilaku Ramah Lingkungan</b>	2.482	.013*	413

#### 4 DISCUSSION

In this research, we find that indeed pupils who attend a nature-based curriculum schools do have a significantly higher mean score in pro-environmental behaviour compared to its general-based curriculum counterpart. This means that the students who attend schools who uses a green-based

curriculum behaves more pro-environmentally compared to students who attend a general-based curriculum. However, quite contrary than what was hypothesised, nature-based curriculum schools do not necessarily result in having students who have a significantly different score in all variables related to pro-environmental behaviour. Therefore, the hypothesis of this research cannot be proven.

It is proven that there are even several variables in which pupils who attend schools with a general-based curriculum perform even better compared to their nature-based school counterpart. Infact, there were even two cases in which the general-based school curriculum is superior compared to their nature-based school counterpart. Variables ascription of responsibilities and personal norms are found to be significantly higher amongst participants who attend a general-based school curriculum compared to their nature-based school curriculum counterpart.

This means that students who attended schools with a general-based curriculum have a better understanding of the knowledge related to environmental issues and the importance of conducting it in real life. However, the majority of them did not actually behaved according to the knowledge that they have and have chosen to not behave pro-environmentally.

Quite different from students who attended schools with a general-based curriculum, students who attended schools with a green-based curriculum may not have a full understanding of why they should behave pro-environmentally, but because they are accustomed to a pro-environmental way of life and have good role-models for it, they in result perform more pro-environmentally compared to students who attended a general-based curriculum.

Based on the results that were obtained, we have concluded several reasons as to why it did not show as hypothesised. The first reason why general-based curriculum schools perform better in variables which represents belief and norms is because its environmental education heavily emphasized the consequences theoretically rather than actually emphasizing the impact of every action that they take in their daily lives.

So that in both curriculums environmental education can be implemented effectively, it is advised in this research paper that general-based schools focus on increasing facilities and activities that give their students opportunity to demonstrate what they learn. Whereas it is advised in this research paper that nature-based schools should increase the theoretical aspect of their environmental

education so that their students fully understand how their actions really impact on the environment as a whole and not just act based on habit.

## 5 CONCLUSION

Through this research, we have concluded that the schools curriculum indeed affect to the pro-environmental behaviour of its students. As explained previously, we concluded that schools with a green-based curriculum that accustom their students to behave pro-environmentally do make a positive habit, even though they do not have the knowledge of why they do it. On the other hand, schools with a general based curriculum have successfully delivered the knowledge related to environmental issues and how important it is to behave pro-environmentally, but without habituation and modelling of the behaviour in their daily life, the students will not actually perform the behaviour in their daily lives.

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