

Teaching Pro-Environmental Behavior: A Challenge in Indonesian Schools

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Abstract

Although most researchers agree that environmental education is very important to develop pro-environmental behavior (PEB) in children, it is uncertain whether environmental education has positive outcomes, especially in Indonesian schools. This study tried to get some insight into whether green school students will have a higher nature relatedness and thus will behave more environmentally friendly, compared with students from schools with a regular national curriculum. In this study, 304 elementary public schools' students and 229 green schools' students participated. Data were collected through self-report scale, behavioral observation and Focus Group Discussion (FGD). The result shows that green school student's, as well as children from public school, do not differ in their appreciation and understanding of their interconnectedness with all other living things on the earth. In other words, their nature relatedness (NR) are relatively similar. As hypothesized, if faced with the choice to act environmentally friendly, the PEB of green school students were significantly higher than public school students. But interestingly, information from FGD reveals that green school children PEB is not based on knowledge or concern for the environment, but rather a result of habituation and social modelling of their friends. On the other hand, public schools students have the knowledge, but they do not implement it in daily lives because they are not used to do it. It is concluded that environmental education curriculum does have a role in shaping students PEB, but to develop a sustainable PEB in young children, schools should focus on environmental knowledge, to develop and internalized pro-environmental value, and they should also develop ways to habituate PEB.

Keywords

Nature relatedness, Pro-environmental behavior, Schools' curriculum, Students

The world is facing various and severe environmental problems: global warming, pollution, overpopulation and nature depletion are some of the problems we are all facing, and the solutions are not easy. But, if we all let these problems continue, then the earth and its biosphere are threatened with destruction (Turner, 2012). The current environmental problems seem to be an accumulation of various problems that have occurred since the last two hundred years (Gibbens, 2018), creating an array of complex

issues. Predictions of environmental scholars are quite worrying because global warming will have severe economic, social, political, and health consequences as the 21st century unfolds (Baer & Singer, 2016). To solve and prevent environmental problems, human behaviors plays a very important role (Uzzell & Rätzhel, 2009). It is up to humans how to decrease the unwanted impacts of our lifestyle and industry towards our environment.

Preventing environmental problems can be achieved if all humans behave more environmentally friendly. To achieve this, environmental education plays an important role (Chawla & Cushing, 2007). Environmental education is an important way to address

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environmental issues with the aim of protecting and preserving the environment. The focus of environmental education is to foster people to understand, value and apply sustainable pro-environmental behavior (Hungerford, 2009; Potter 2010). Through environmental education we can learn ways to address environmental problems, preventing more damage to our environment, and we can also learn how to protect and preserve the environment.

The importance of environmental education has been recognized since the early 1900s (Palmer, 2002). Since then, environmental education schools have been included as a part of the curriculum. In Indonesia, the importance of environmental education has also been acknowledged since the 1990s (Nomura, 2009). Since then, learning materials that contains knowledge about the environment and the importance of environmentally friendly behavior have been taught in schools, both public schools and private schools as part of the national curriculum. Although environmental awareness has long been a teaching topic in the schools, it is uncertain whether environmental education have positive outcomes in Indonesian society. Some studies showed that Indonesian society is low in their support to preserve the earth (Kiswanto & Pityo, 2016; Suleeman, 2017; Susilastri, 2015). According to the authors' observations based on daily life activities, the behavior of environmental awareness of the Indonesian people is still low.

Changing adults' behavior to be more environmentally friendly, is indeed a challenge that is not easy and certainly still needs to be investigated to find the most efficient and effective ways. On the other hand, preparing the young generation to be more environmentally friendly is also very essential, because the sustainability of our earth is in their hands too. As has been said before, environmental education has already been implemented in Indonesian schools' curriculum since the 1990s. Thus it could be said that the younger generation could be assumed to be aware of environmental problems and why they should be environmentally friendly. Apart from being part of the curriculum in both public and private schools, there are also schools that gives special attention for the environment issue and call themselves "sekolah alam" meaning nature

schools. In this article, these schools will be referred as green schools.

Green schools offer an education that uses the natural environment as a source of learning. In green schools, students learn in nature and using various facilities that are already available in nature (Sekolah Alam Indonesia, n. d.). In other words, children from green schools are given many opportunities for learning from natural phenomenon. This will greatly benefit the learning process for students because they will get direct experience, which will make their learning process more optimal (Jose, Patrick & Moseley, 2017). Besides that, the learning process in nature itself will make students have more experience with nature. So it is expected that green school students will appreciate and respect nature more than students who go to "normal" schools. For example, they will learn biology direct from gardening activities or using self-made compost for the plants in the school garden. So, logically, it could be assumed that students from green schools are intensively taught pro-environmental behaviors such as reducing waste and recycling. Because their classes could also take place in nature, they are more exposed to nature. By being taught more intensively and having spent more time in nature, we hypothesized that green school students will appreciate and will feel more connected to nature than public school students. In other words, we hypothesized, students from green schools will have a higher nature relatedness (NR) and also because they are taught how to behave more environmentally friendly, they will have a higher pro-environmental behavior (PEB) compared with public school students.

Nature relatedness (NR) is a construct describing individual levels of connectedness with the natural world (Nisbet, Zelenski & Murphy, 2009). Nature relatedness is manifested in three dimensions: NR-Self, NR Perspective, and NR-Experience. NR-Self dimension explains the extent to which an individual identifies him/herself with the nature. A person with a high NR-Self will think and feel that he is an integral part of nature. The NR-Perspective dimension explains how one views life on earth, namely that human behavior will always have an impact on all living things on earth, while the NR-Experience dimension explains the extent

the individuals' physical familiarity with the natural environment and his/her desire to be in the nature (Nisbet, Zelenski, & Murphy, 2009).

Previous studies showed that individual with high nature relatedness would have a higher environmental concern (Nisbet, 2013) and environmental concern correlates positively with pro-environmental behavior (Kao & Tu, 2015; Mayer & Frantz, 2004). It is also known that individuals who care for the natural environment would also want to protect it (Frantz, Mayer, Norton & Rock, 2005; Nisbet, Zelenski, and Murphy 2009). Nature relatedness is expected to counter the current environmental problems. If people believe they are a part of the earth or nature, environmental problems could be solved through environmentally friendly behavior (Schultz 2002).

Being concerned about what is happening to our earth and environment is important to reduce the adverse effects on the environment (Gifford & Nilsson, 2014) and this could be achieved through environmental education, especially for the younger generation. Of course, environmental education is important to be given for every generation, but it is most crucial to teach our younger generation. The young generation are the one who have to deal with the environmental problems inherited from the previous generations. They have to resolve the mistakes that occurred in the past, and at the same time, they also have to think of ways to prevent the environmental damage of getting worse.

Table 1. Demographic characteristics of the participants

Aspect		N	%
Students	Green School Students	229	42.96
	Public School Students	304	57.04
	Total		
Gender	Male	284	53.28
	Female	226	42.40
	NA	23	
	Total		
Age	10 - 11	471	88.37
	12 - 13	62	11.63

Previous research showed that environmental education especially for the younger generation, played an important role in

this pro-environmental behavior (De Leeuw, Valois, Ajzen & Schmidt, 2015). The younger generation have a great potential to change and save the earth from more severe damage. However, research shows that not everyone will care about environmental problems (Doherty & Clayton, 2011). In addition, there are also studies that show that younger people are more reluctant to commit to pro-environment behavior (PEB) than older people (Grønhøj & Thøgersen, 2012). But other research shows that that strengthening connectedness to nature is more sustainable before the age of 11 (Liefländer et al., 2013), in the hope that this nature relatedness will last until the child becomes an adult, and this will influence the child to be a lifelong pro-environmental individual. Thus, it can be said that the nature relatedness is a very important characteristic to be taught in schools, so that the younger generation has a high concern for the environment and consequently they will be willing to be more pro-environmentally friendly.

This kind of research—seeking factors that are associated with pro-environmental behavior—are important, as they will give important knowledge for developing environmental educational interventions that aim to enhance pro-environmental behavior (Gifford, Steg, & Reser, 2011; Truelove & Gillis, 2018). In this study, the authors would like to explore whether the NR from Indonesian students will also correlate with PEB like in other countries (Nisbet et al., 2009). The study is also aiming to get some insight whether green school students will have a higher nature relatedness (NR) and thus will behave more pro-environmental, compared with students from schools with a regular national curriculum. Assuming students from green schools will have more knowledge about PEB and their school curriculum will focus on developing affection towards environment, besides training their pro-environmental behavior, the authors decide to compare the elementary students from green schools and from public schools.

Methods

A cross-sectional survey method was used to collect data from 229 green schools' students

and 304 elementary public schools' students. The demographic details, such as type of schools, gender and age are illustrated in Table 1.

Participants. The participants of this study were elementary school-aged children coming from schools with "a green curriculum" and from public schools with a national curriculum. The distance of the green schools and the public schools which are chosen to be compared, was within a two km radius. The authors also tried to control the socio-economical standard of the participants, by choosing schools attended by the majority of the middle-class students.

The authors searched for green schools and public schools that are close by, to be selected as the research location. After communicating with schools that met the research criteria, 14 schools were willing to help the data collection. After obtaining permission from the school, the researcher then distributed a form to get parental informed consent. Only if students have their parents' consent, they may participate in the study. There are several other criteria that must be met by students to become research participants:

- a. elementary students who are enrolled as fifth graders (5). There are two reasons why participants should be in the fifth grade; first they have already reached the concrete operational stage (Piaget, 1964), which allow them to think logically about concrete events. In the fifth class, they also can read fluently and explain their opinion.
- b. The participants must have attended the same school since grade one (1) elementary school. This strategy is intended to control the length of education because the influence of environmental education is also determined by the location and duration of the program (Collado, Staats & Corraliza, 2013).
- c. The participants must have lived in Indonesian cities for at least for a minimum of six years. This is done to ensure that there are no other cultural and environmental influences. For example, if the participants are raised in a develop Europe country, they may act pro-environmental because they learned it in previous country of residence.

Table 2. PEB Score

Behavior	Category/Scoring			
	Often/ Plentiful (1)	(2)	(3)	Seldom/ Few (4)
Plate	>8	5-8	3-4	0-2
Glass	>8	6-8	3-5	0-2
Straw	>8	5-8	3-4	0-2
Bag	>7	5-7	3-4	0-2

These criteria are applied with the purpose to control the constants of the conditions and characteristics of participants (Seniati Yulianto, & Setiadi, 2015). The characteristics of other participants, namely gender, were also controlled using the matching method, so that the students gender proportion from green schools and public schools are the same.

Measures. NR Scale. The authors adapted and modified the NR-Scale developed by Nisbet et al., (2009). The original scale consisted of 21 items, measuring three dimensions: NR-Self, NR-Perspective, dan NR-Experience. The authors have to adapt the scale to suit the conditions in Indonesia and also to make sure that elementary students will understand the statements given. Before using it for data collection we calculated the reliability and internal validity. In general, the results show that NR scale has good items. The Alpha Cronbach coefficient was 0.77, which can be categorized as showing good reliability because it is above 0.70 (Lance, Butts, & Michels, 2006). Unfortunately, when testing items per dimension, reliability testing only showed good

Table 3. PEB Score

Behavior	Reasons	
	Not Environmental-Friendly	Environment al-Friendly
Not Environmental-Friendly	1	2
Environmental-Friendly	3	4

results on the dimensions of NR-Self (alpha Cronbach coefficient: 0.79). Whereas the alpha Cronbach coefficient for the NR-Perspective and the NR-Experience of dimension was not

satisfactory (0.55 and 0.46). Therefore, the researchers decided to measure NR as an unidimensional scale.

The final results of the item selection process produced 14 items that showed good reliability (alpha Cronbach's coefficient: 0.87) and good validity (C_{IT} ranging from 0.41-0.61). The NR scale used in this study consisted of four categories ranging from do not agree at all (score 1) until strongly agree (score 4). Participants with higher scores are considered to have higher NR than participants with lower scores.

PEB (Self-report, Observation and FGD). To measure PEB, the author combined scores from a self-report PEB scale (how often the participants use plastic plates, glass, straws and bags in the past week), observation and FGD. The self-report PEB scale consisted of four categories ranging from often/plentiful using plastic utensils until seldom/using a few plastic utensils. The criteria for scoring are given in table 2.

The authors wanted to measure the actual pro-environmental behavior from the participants. In the study, the authors arranged so that participants get the opportunity to show their actual behavior related to their concern for the environment (PEB). After the participants finished answering the questionnaires, participants were called one by one and they were asked to choose how they would take their reward (snacks and drinks). They can decide whether to take a reusable or single-use plastic plate, glass, to use a straw or not, and to use plastic bag or not. Each participant's answers were observed and recorded as their actual PEB response. In the last step, after all participants of one group collected their reward and made their choices (e.g. using straw or not), the research assistant will begin a focus group discussion (FGD). The purpose of the FGD is to explore the students reasoning of their decision to use which utensils for eating and drinking their reward. To score their actual PEB, the reason of their decision was also considered. The authors categorized four score of the actual PEB (scale 1 - 4). For example, if a participant chooses to drink from a glass and gave the reason that he tries to prevent plastic waste, he will have the maximum score of 4. But if another participant will take a plastic bottled water and give the

reason that he would reuse the plastic bottle into something useful, he will get the score of 2. Their response and reasoning were valued as could be seen in table 3.

The total PEB score is obtained from two sources: The self-reported PEB, the actual

Table 3. Descriptive statistics of NR and PEB

Variables	Mean	SD
NR	3.39	.46
PEB	2.62	.69

observed PEB score (choosing or not choosing to use plates/glass/straw/plastic bag) combined with the reason for their actual PEB. The actual behavior and their reasoning were then assessed by at least three interrater to maintain the objectivity of the assessment. The scoring of PEB criteria is shown in Table 3. Participants with higher scores is considered to behave pro-environmentally than participants with lower score.

Procedure. To collect data, the authors follows four steps: First, the authors checked who among the 5th grade students were eligible to participate in the study (if they had returned their parents' informed consent). The eligible students were grouped randomly with 4-7 students. Each group had one research assistant, to ensure that they understood each item and instruction, and also to guide the FGD session later on. Second, participants filled out the NR questionnaire and a PEB self-report. Third, the participants were called one by one and they were asked to choose how they would take their reward (snacks and drinks). Forth, after choosing their reward, through a Focus Group Discussion (FGD) they were asked why they chose reusable items or single-use plastic product items. The research assistant recorded (in writing) the answers given by participants.

After the FGD, the researcher gave a debrief to explains the purpose of this study. It was explained that this research aimed to find

Table 4. NR and PEB t-test Result

Variables	t	df	Sig. (2-tailed)	Std. error Difference
NR	-1.06	531	.292	.04
PEB	10.33	513.18	.000**	.56

Table 5. Independent Sample t-test Result

Variables	Mean (Green School)	Mean (Public School)	t test	L.o.S	Interpretation
PEB (total)	2.95	2.38	10.33	0.01	Significant
PEB (SR)	2.86	2.53	4.29	0.01	Significant
PEB (O)	3.01	2.24	11.65	0.01	Significant
PEB Plate (total)	2.86	2.14	9.21	0.01	Significant
PEB Glass (total)	2.84	2.37	6.00	0.01	Significant
PEB Straw (total)	3.11	2.32	12.04	0.01	Significant
PEB Bag (total)	2.93	2.7	3.37	0.05	Significant
PEB Plate (SR)	2.83	2.38	4.54	0.01	Significant
PEB Plate (O)	2.89	1.9	9.45	0.01	Significant
PEB Glass (SR)	2.84	2.61	2.36	0.05	Significant
PEB Glass (O)	2.84	2.13	6.91	0.01	Significant
PEB Straw (SR)	3.13	2.39	7.54	0.01	Significant
PEB Straw (O)	3.08	2.25	9.73	0.01	Significant
PEB Bag (SR)	2.63	2.74	-1	0.05	Not Significant
PEB Bag (O)	3.23	2.66	6.64	0.01	Significant

out the reasons people behave in an pro-environmentally. Pro-environmental behavior is explained as a behavior carried out to care and save the environment from damage such as global warming, the extinction of various animals or plants, environmental pollution, and others. After giving the debrief, the researcher thanked the research participants and the school for allowing the research to be carried out.

Data from the questionnaire and PEB score was analysed through independent sample t-test in with the SPSS program.

Result

In this study, we aim to prove that students score in NR will have a positive correlation with PEB. It is suggested that (Hypothesis 1) students with a higher NR will tend to have a better PEB. The second hypothesis is to gain insight whether schools which give more attention to environmental education will have students who are more related to nature and are also more environmentally friendly. Students who came from green schools will have higher NR (Hypothesis 2) and a better PEB than students from public schools (Hypothesis 3).

Descriptive analysis shows that both NR and PEB is higher than hypothetical median of 2

out of the maximum score of 4. NR has the mean of 3.39 (SD = .46). PEB has the mean of 2.62 (SD = .69). It could be said that the average NR of our participants is relatively good (above the median), but their PEB could be categorized only as sufficient, because the results (Mean 2.62) shows slightly above the median.

In this study (see table 4), we found that NR did not correlate with PEB ($\beta = 0.032$; $p > 0.05$). This means that the first hypothesis is not supported by our data, in which we found that students who had high NR values would not necessarily show a high PEB too, or vice versa.

As for the main result of this study, whether students coming from green school will have a higher NR and PEB, we found interesting results. For the second and third hypothesis we calculated the T-test, comparing NR score (hypothesis 2) and PEB score from green school students and public students. The results of independent sample t-test (see table 4) showed that there is no significant difference of nature relatedness $t = -1.056$, $p < 0.05$ (two-tailed) between green schools ($M = 3.37$, $SD = 0.54$) and public-school students ($M = 3.41$, $SD = 0.39$). Although the average score of nature relatedness in public school students is higher, it is not significant. This means that the hypothesis null for hypothesis 2 also failed to be rejected.

For the third hypothesis we found a significant difference $t = 10.328$, $p < 0.01$ (two-tailed) on pro-environmental behavior between green schools ($M = 2.95$, $SD = 0.59$) and public schools' students ($M = 2.38$, $SD = 0.66$). It is proven that green schools' students behave more pro-environmentally than public schools' students. According to this result, the alternative hypothesis for the third hypothesis is accepted. This means that students from green schools actually do show more pro-environmental behavior. They significantly try to reduce plastic waste by choosing reusable plates, glasses and declining using straws and plastic bags.

To gain a more comprehensive understanding of students PEB, the authors compare self-report answers and actual PEB: whether self-report (SR) PEB and observed (O) PEB of students from green schools is significantly higher than public schools' student's data (see table 5). Green school students self-reported PEB data are significantly better. The same result could be observed for choosing to use reusable plates, glass, not taking straws, but not in the case of plastic bags. Thus, it can be said that the PEB behavior of green school students is indeed significantly better than public school students. So, it can be said that the curriculum given in green schools does enhance the PEB of students. But, the result of the non-significant difference in NR still remains unexplained. Results from FGD provide some information on this phenomenon. During the FGD, the green school students explained that they do PEB automatically without considering anything, and also because they just imitate what their friends do. From table 5, it could be inferred that three of the actual observed PEB (not using plate, glass, plastic bags) mean score from green school students are higher or the same as the mean score of their self-reported PEB score. On the other hand, all actual observed PEB mean scores from public-school students are lower than the mean self-report PEB. In other words, students of public schools know what they should do for the environment, but they do not actualize their knowledge by acting PEB.

Discussion

From this study, it can be concluded that the green school curriculum which emphasizes the learning process in nature, and by giving students the experience of directly learning through interacting with nature does increase pro-environment behavior. This can be seen from the significant differences in the behavior of PEB green school students both those reported in writing and what they actually did. This result goes in line with other research is done in other countries students who apply pro-environmental behavior in daily lives. But apparently, their PEB is not correlated to their relatedness to nature. We hypothesized that a higher NR would be followed by a better PEB, but this was not the case in this study. On the contrary to our hypothesis, this research showed the absence of a relationship between NR and PEB. This means that for our participants, having a high appreciation towards nature and seeing them-self and other living creature as a part of nature does not relate to being pro-environmental or not. The result of this study is different from the studies done in western countries (Nisbet et al., 2009; Davis, Green & Reed, 2009; Zelenski, Dopko & Capaldi, 2015). The authors suggest to do more research in this topic because other researchers are also questioning how to ensure that environmental education can help promote and sustain connectedness with nature (Liefländer, Fröhlich, Bogner & Schultz, 2013).

There are several possibilities why NR and PEB did not have any correlation in this study. First, this study includes elementary school children, which are still very young. Maybe for young children, being related to the nature have not internalized as a value yet. Because of this reason, there were no significant NR differences between green schools students and public schools students. The second possibility is caused by the limited ability of elementary students to answer the questions by using scales. Although before the real data collection, the authors already asks some students whether they could understand the questions, they may not all of the participants are familiar expressing their thoughts in scale. So, they may answered the question by giving an answer on the scale, but they do not really understand what they

answered. For future research, it would be good to develop a better measurement for elementary students.

The study shows that green school students do behave more pro-environmentally friendly than public school students, nevertheless, their nature relatedness is not significantly higher than public schools' student. From the FGD done to explore their reasons in deciding being pro-environmental or not, the authors found that their PEB is not caused due they see themselves as a part of nature, or they want to prevent damage to the environment, but merely because they are drilled and habituated by their school community to apply certain behavior without knowing the reason. It could be concluded that the green schools' curriculum may have a positive impact on developing the younger generation to be environmentally responsible, but for the long run, this will not be a sustainable resolution. Their PEB is not internalized, and this maybe caused by the learning process in green schools which emphasizes more on the application of pro-environmental behavior, rather than the development of knowledge and critical thinking.

Compared with students from the public schools, they do have the knowledge about environmental problems and how to prevent more damage to the environment ideally, but they do not apply it because the lack of community support. Maybe this is due to a lack of role models in the community that really act environmentally friendly behavior consistently, and also encourage students to do PEB. As pre-adolescence, the role of peer acceptance is very important (Oberle, Schonert-Reichl, & Thomson, 2010) and being different than their peers, is not an easy life for pre-adolescent because it will threaten their well-being (Holder & Coleman, 2009). Thus they will follow each other's example, especially what is done by peer groups who are considered to have high social status. This fact gives an opportunity to do an intervention collectively. Because of the important role of peers for students, in interventions aimed at increasing their PEB, this should be an important consideration

To prepare the younger generation to be more pro-environmental, the schools' curriculum should give opportunities for

students to understand and explore knowledge about human behavior impact on the environment. To develop a sustainable PEB in young children, schools should focus on environmental knowledge, to develop and internalized pro-environmental value, while also applying ways to habituate PEB. By understanding what is happening to the earth and how to prevent it, they will form positive attitudes and positive values towards the environment (Chawla, & Cushing, 2007). So, they should have a good basis of knowledge and develop a deep caring of the environment by having a positive experience in nature. After they develop a positive attitude towards nature, if it is consistently practiced, it will be internalized as a positive value towards the environment. To endorse and habituate their actual PEB, they need positive support from role models like peers, teachers and parents (Matthies, Selge, & Klöckner, 2012). If the appreciation towards the earth and all living things are deeply internalized, the younger generation will hopefully do pro-environmental behavior with full awareness and passion.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the authorship and/or publication of this article.

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