Assessing High School Students’ Pro-Environmental Behavior

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Abstract. This paper aims to reveal students’ pro-environmental behavior in a High School. Self-reported behavior assessment was administered in this study involving students with age range 15 to 18 years. Pro-environmental behavior in this study comprises six domains. Those are recycling, waste avoidance, consumerism, energy conservation, mobility and transportation, and vicarious conservation behavior. Pro-environmental behavior (PEB) of science class students was compared to behavior of non-science class students. Effect of students’ grade level and extracurricular activity on the behavior was evaluated. Study revealed that science could improve students’ PEB. It is because environmental topics are covered in science class. Student’s involvement in extracurricular activity may enhance PEB as well. In conclusion, students’ PEB is influenced by class program (science or non-science) but it is not influenced by time length in learning science. This finding could be consider by science educator in choosing strategy to enhance student’s pro-environmental behaviour.

1. Introduction

It was agreed that social, economy and environment should compromise in order to build sustainable development [1]. According to this, environment is an aspect should be considered in all aspects of live. Nowadays, environment faces many problem including pollution, water scarcity, species distinction and also global warming [2,3]. Those deterioration result from human behavior [4].

Education is believed as a crucial agent in changing behavior to become more environmental friendly. In regard to environment, education should cover not only knowledge but also attitude and behavior [5]. Most of Education systems including in Indonesia establish primary school to secondary school as compulsory education. Thus, assessing secondary school students’ pro-environmental behavior can be an indicator of Environmental Education success. It is also expected a feedback on environmental education practice in high school. In order to evaluate environmental literacy including pro-environmental behavior of high school students, many researches were conducted. It was revealed that demographic factor influence pro-environmental behaviour of high school students in Israel and Colcata, India [6,7]. There is also relationship between environmental knowledge and attitude of high school students who has enrolled environmental education class in Texas, USA [8]. Survey on high school students’ knowledge and behavior toward environment which focused on 3R in West Malaysia revealed that urban student has better understanding rather than rural student [9]. Meanwhile, effect of
schooling system into pro-environmental behavior of adolescent and adult was conducted in Thailand [10]. In Indonesian context, surveys to explore university students’ knowledge, attitude and behaviour toward environment were conducted [11]. Perception, knowledge and attitude of Community in Jakarta toward environment were also explored [12]. Survey on believe, attitude and intention of High School student toward environment was also conducted [13]. However, study on high school students’ pro-environmental behavior is still needed.

Environmental education is set in educational system through three approaches; separation, infusion and integration. In Indonesian High School Environmental education can be taught as separated subject through local curriculum, infused environmental topics into subjects such as Biology and Geography or integrated into subjects such as literacy or anthropology. Thus, students among different program (Science, Language and Social) may exposure to environmental issues throughout subjects they learn. Students also involve in extracurricular activities in their school.

Based on the background above, this study aims to reveal pro-environmental behavior of High School students related to their grade level (class), study program they choose and involvement in extracurricular activities. To achieve this aim, survey based on self-assessment was conducted.

2. Research Method

This quantitative research was conducted through survey design. This design is a procedure to administer a survey to describe the attitudes, opinions, behaviour or characteristics of population [14]. Population of this research is tenth and eleventh grade students of a High School in West Bandung, Indonesia. Sample of this study is 231 students were randomly chosen.

To assess pro-environmental behaviour, questionnaire based on self-reported behaviour was used. The instrument was adapted from Kaiser, Oerke and Bogner [15] which comprises six domains and 40 items. Two items regarding season condition were excluded and five items related to cultural context were added. Each item was pre-tested to test the validity and reliability. Thirty four out of forty three items is valid. The instrument is reliable with Cronbach’s Alpha reliability coefficient 0.888. The questionnaire used a Likert response scale from 1 (never) to 5(always). The questionnaire also included a set question of student’s background namely class, program, and extracurricular involvement. Students were classified according to grade or school level into two groups; tenth grade and eleventh grade. Students were categorized into Social, Language and Science class according to program they choose. Students were divided into two group based on their involvement in extracurricular activities (yes or no).

The ordinal data from questionnaire were changed into interval number through Method of Successive Interval (MSI) prior to statistics analysis. Data were analysed using statistics software determining means and standard deviation through descriptive statistics. Multivariate Analysis of Variance (MANOVA) was conducted to examine relationship between grade, program, involvement in extracurricular activities and pro-environmental behaviour (PEB) generally and six domains of PEB.

3. Result and Discussion

3.1. Effect of School Program on Pro-environmental Behavior

According to multivariate test, students’ PEB is affected by program (p=0.007) and involvement in extracurricular activities (p=0.026) but is not affected by their grade (p=0.076). Bonferroni Post Hoc Test indicated students’ program (Language, Science and Social) significantly affected energy conservation, waste avoidance and recycling behaviour. Means of those behaviours between three programs are shown on figure 1 and 2. Bonferroni test showed that there is a significance differences between behaviours of science students and behaviours of social students, meanwhile the differences is not significant for language and social either language and science students.
Figure 1 shows the comparison of pro-environmental behaviour among students from different study program namely Language, Science and Social. According to the figure science students tend to have higher score than social students in terms of general pro-environmental behaviour. Meanwhile, language students tend to have in between score of the behaviour. This finding is contrary to study in Kolkata, India which there is no difference between behaviour of Science and Commerce student and PEB of Science students are lower than PEB of Art Student[7]. It is expected that Science Students have higher PEB than others due to their exposure to environmental issue in some Science Subjects.

Figure 1. Pro-environmental Behaviour Score of Students from Different Study Program

Post-Hoc Test about relationship between study program and six pro-environmental behaviour domains indicated a significant difference on energy conservation, waste avoidance and recycling behaviour. Means score of those score are showed on figure 2.

Figure 2. Behaviours Score of Students from Different Study Program

Figure 2 shows that science students tend to have the highest score on energy conservation, waste avoidance and recycling behaviour. This is because science students may accept more information about those topics. However, there is no significant difference on other three domains namely transportation and mobility, consumerism, and mediated conservation behaviour. Behaviours regarding mobility and transportation of student from Language, Science and Social Class are almost the same. It is because behaviour such as walking and choosing bicycle or public transportation rather than motorcycle is presumably influenced by complex factors. Geographical condition and poor management of public transport are among probable factors.
3.2. Effect of Students’ Grade Level on Pro-environmental Behavior
In term of students’ grade level, it is indicated that students’ grade level (class) has no significant effect on pro-environmental behavior (PEB) and six domains of PEB. Among general PEB and PEB domains, energy conservation is the only domain affected by students’ grade level as shown in the table 1.

| Behaviour                          | p Value |
|------------------------------------|---------|
| General PEB                        | 0.311   |
| Energy Conservation                | 0.013   |
| Transportation and Mobility        | 0.979   |
| Waste Avoidance                    | 0.541   |
| Recycling                          | 0.568   |
| Consumerism                        | 0.355   |
| Vicarious Conservation Behaviour   | 0.974   |

Table 1. p Value of Effect of Students’ Grade Level on Pro-environmental Behaviours

When pro-environmental behaviours between tenth and eleventh grade students were compared, there is no statistically significant difference even tenth grade science student and eleventh grade science student. Meanwhile tenth grade science students in this study have not learnt Ecosystem and Pollution concept formally in the classroom whether the eleventh grade have experience learning on these concepts. This finding challenges teachers to think how to teach student environmental concepts in order to encourage pro-environmental behaviour. Approaches, method and media should be considered. There is an alternative to conduct more active learning in Science classroom as these approaches could promote students ecological affinity [13].

3.3. Effect of Extracurricular Activities on Pro-environmental Behavior
Students’ involvement in extracurricular activities has a significant effect on pro-environmental behavior. Extracurricular activities have significant effect on almost all behavior except vicarious conservation behavior (p=0.186). Student who involve in extracurricular activities incline to have higher environmental behavior than student who does not involve in this activities. Extracurricular activities often provide student broad horizon about environment. They also often give students opportunities to build tight bonding with nature and engage in some environmental projects.

This study did not explore types of extracurricular activities students join whether it relates to art (e.g. music, dance, and theatre), religion (e.g. Youth Moslem Association), sports (e.g. basketball, volleyball and football team), literacy (e.g. Library Lover), Science (e.g. Science Club) or health and nature (e.g. red cross and nature lover). Thus further study regarding this need to be conducted.

4. Conclusion
This study tried to picture students’ pro-environmental behaviour of a High School. The findings cannot be generalized into all high school in Indonesia at national or regional level. Further studies to explore the behaviour within larger population still have to be conducted. This study revealed that pro-environmental behaviour relates to program student chose and extracurricular activities student joined but does not relate to students’ grade level. Since there is no difference between pro-environmental behaviour of tenth grade students and eleventh grade student it is highly recommended to establish researches about strategy, approach or model in order to affect students’ environmental behaviour in infused and integrated environmental education curriculum.
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