

# Association of Gakko Soji and Littering Behavior by Examining Environmental-Efficacy: A Comparative Study between Japanese School and Indonesian School

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**Abstract**— Waste management has been one of the major problems in Indonesia. Besides the inadequate waste management system, it is also due to the lack of awareness about waste disposal that leads to littering. Littering does not only occur in low educated community, but also occurs in educational institutes. This research aims to investigate the association of the presence of *gakko soji* in school curriculum to the development of anti-littering attitude. The study is conducted by measuring the environmental efficacy as one of the psychological determinants of littering attitude. The result shows that the average score of environmental efficacy is higher among Indonesian students than Japanese students, but both average scores are still in the same category. Another finding is that the score variation is lower with the students who have experienced *gakko soji*. The result indicates the presence of probability that *gakko soji* provides uniform environmental education to students.

**Index Terms**—littering, *gakko soji*, environmental efficacy, school curriculum, environmental education, Indonesia, Japan

## I. INTRODUCTION

Waste management has been one of the major problems in Indonesia. According to the data released by [1], 69% of annual waste in Indonesia is left unmanaged in unspecified landfills. This is due to the inadequate management system, which leads to waste being disposed altogether to dump sites. Besides the system, the unmanaged waste in Indonesia also derives from the lack of individual awareness. According to the same source, 9% of waste which is equal to 5.686.000 tons, in Indonesia are disposed in rivers and streets. Litters have

led to several social and health problems in Indonesia, which could affect community's safety and health. In the main waterway of the capital city of Indonesia, Jakarta, 165 tons of wastes are extracted daily [1]. The existence of waste in the waterway undermines a poor water circulation that causes another serious issue related to water management system. For the last decade, Indonesia has experienced 6.042 events of flood, causing thousands of lives missing and damaging health, education, and worship facilities [2].

Littering in Indonesia is not only happening in uneducated community. It also happens in educational institutes. A study has found that there is a gap between awareness and behavior level among Indonesian students about throwing garbage to garbage bins [3]. Another study has found that daily behavior and knowledge are key factors determining public awareness regarding the environment at university [4]. These facts indicate that the environmental education in Indonesia's national curriculum need improvements in order to implant pro-environmental behavior. On the contrary, Japan is one of the countries with a forward level of waste management. As [1] has shown, 80.2% of the waste in Japan is managed through incineration, and only 1.1% is dumped in the controlled landfill. Besides that, Japan is steps ahead when compared to Indonesia about maintaining a litter-free public area. Such progress has gained attention from researches to study Japan's educational style in a large scope [5]-[7], whereas [8] has particularly discussed the role of school curriculum to address littering in Japan.

Therefore, this research aims to conduct a comparative study to find out whether the difference of environmental education approached by school curriculum is associated to different littering practices in Japan and Indonesia by examining environmental efficacy. This research is

designed to initiate study and research regarding the correlation between Indonesia's environmental education and littering behavior.

## II. BRIEF LITERATURE

### A. Factors Affecting Littering

#### 1) Socio cultural

Socio cultural approaches emphasize the interdependence of social and individual processes in the construction of knowledge [10]. Socio cultural also involves education, as human generally gain knowledge that will construct their behavior in the future. [11] has also stated that reality constructs how we see and behave towards life. Therefore, education as socio cultural in this case is constructing how people see reality. If they think that littering is not an immoral action to be done, then that is how reality is constructed for them.

#### 2) Presence of garbage bin

To not litter, one must throw their garbage into designated garbage. Based on the study done in West-Bank Palestinian Territories with 1000 samples from a wide spectrum of social and economic status, majority of the samples claimed that the absence of garbage bins or litter cans had driven them the most to do littering [12]. Additionally, [13] has stated that availability of adequate garbage bin plays a big role in the intervention to stop littering. Garbage bin should not only be concerned on its quantity, but also the quality. They have also found that people tend to throw garbage at the open-top and clean garbage bin. Therefore, the presence of adequate garbage bin with both quality and quantity might be a strong driver for people to avoid littering.

#### 3) Policy on littering

In the case of littering, policy is needed to prevent and deter people from doing litter. It is crucial to determine the act of litter among society by using policies, because they are mandatory for the society to follow [14]. In 2016, Ministry of Environment and Forestry of Republic of Indonesia had issued Ministerial Circulars No. S.1230 regarding waste management to promote pro-environmental [15]. However, the implementation of the policy is viewed as inadequate to stop the action due to the fact that littering still occurs frequently.

### B. The Concept of Environmental Efficacy

Self-efficacy is defined as a belief about their capabilities to produce designated levels of performances that influenced event in their live. It is believed that strong efficacy enhances human accomplishment and personal well-being in many ways [16]. In this case, self-efficacy might be shaped through life-long cognitive processes. Environmental efficacy is affected by the personal belief that they have the sufficient knowledge related to the competency [17]. As environmental efficacy was strongly gained through mastery of experiences, witnessing the degradation of the environment can be a positive predictor of the scale of environmental efficacy in people [11], [16]. Additionally, individual with long-term orientation has higher regard

for future concerns, including the condition of the environment that could be affected by his action [17].

On the other hand, environmental self-efficacy is operationalized as a confidence of an individual in his ability to successfully perform behaviors that can solve environmental problem in the face of different barriers [18]. In his article, Oluoyinka mentioned that environmental efficacy construct has both practical and theoretical implications towards littering, for taking adaptive environmental action in the face of constraints requires the belief that one has the knowledge, and skills necessary to perform. Therefore, environmental efficacy and the belief toward littering could affect littering attitude [9], [19].

### C. Relation between School Curriculum and pro-Environmental Behavior

The education takes an important function in shaping individual perception through learning process of what is basically right and wrong [20]. School is a legal form of learning system ruled by both government and the private sectors. Curriculum in school play role in implanting desirable knowledge, value, perception, and moral to the students [21], [22]. Regarding the littering, researchers have found that normative controls need both internal control and cognitive information that developed through process of socialization [23].

### D. Current Condition of Environmental Education in Japan and Indonesia

Generally, environmental education in Indonesia is only taught theoretically with less practical approach. A survey to 363 sixth graders in Makassar, Indonesia, revealed the relation of awareness and behavior of the students regarding environmental issues. It was found that even though 90% of the students answered that they threw garbage into cans, those answers were contradictory to the observed real condition on the field [3]. This indicates that there is a gap between awareness and behavior among Indonesian elementary students. In other words, the school might have succeeded in rising awareness, but not on implanting the behavior.

School cleaning is practiced in both Japanese and Indonesian elementary schools. However, the intensity and the disciplinary of the practices are generally different. In Japan, school cleaning is named *Gakko Soji* [24]. *Gakko Soji* has been more than activity of cleaning, but it is viewed as a capacity building tool. It encourages sense of responsibility, cleanliness, and interpersonal and social skills. It also aims to teach students the importance of working with and for others [25]. Because it is a standardized curriculum, minor difference exists among public schools. Usually, *gakko soji* is conducted for 20 minutes. Therefore, it is necessary for the students to do their task effectively through teamwork. The teacher also plays a role in the act of *gakko soji*. They should give example on how to operate cleaning tool and take part in the act [26]. On the other hand, the form of school cleaning in Indonesia varies, depending on the school. Some schools name the practice as *Operasi Semut* or

*Piket Kebersihan*, which is optional for the school to implement [27].

### III. METHODOLOGY

The population target of this research is elementary students in the final batch. The convenient sampling method was conducted in February to March 2019 that involved one public school located in Ono City from Hyogo Prefecture in Japan and one public elementary school in East Jakarta City from Indonesia. The school in East Jakarta was chosen due to its achievement as one of the prominent schools in Jakarta. Its purpose is to minimize fallacy effect due to the gap of school standard in Japan and Indonesia. The independent variable of this research is the experience to *gakko soji* while the dependent variable is the environmental efficacy score. Therefore, the sample consists of two groups of 6 grade students. The Japanese school is the group that experienced *gakko soji* while the Indonesian school is the group that does not experience *gakko soji*. Therefore, one group consists of Japanese 6 grade students and the other consists of Indonesian 6 grade students.

The data were collected by conducting simple interview to the school headmaster and addressing questionnaire to the students. The interview was aimed to gather information of school characteristics and the frequency of cleaning routine and extensive cleaning. The cleaning routine is the cleaning activity conducted daily while extensive cleaning is the practice that involves all students and teachers to clean school thoroughly.

On the other hand, the questionnaire includes 10 items to measure environmental efficacy of grade 6 in both schools. 5 Items referred to an environmental efficacy scale by [28] while the rest is constructed based on self-efficacy constructs. Each item consists of four scale of answers (strongly agree, agree, disagree, and strongly disagree) and each is scored from 1 to 4. Therefore, the maximum score is 40 for each student. The environmental efficacy score will be classified into to four categories (Table I.) to guide the analysis of the result.

Additionally, back-translation to Indonesian and Japanese was conducted thoroughly to validate the questionnaire in prior to administer it to both schools. Questionnaires that have been translated to each language are administered to both groups.

TABLE I. CLASSIFICATION OF ENVIRONMENTAL EFFICACY BASED ON THE AVERAGE ENVIRONMENTAL EFFICACY

No.	Average Environmental Efficacy Score	Category
1	1 - 10	Poor
2	11 - 20	Moderate
3	21 - 30	Sufficient
4	31 - 40	Good

Then, the collected average of environmental efficacy score from both groups are compared and analyzed by SPSS to conduct the compared mean tests.

## IV. RESULTS

### A. Schools Profile

Based on the interview, several information about school characteristics were identified (Table II.). The grade 6 students were divided into 3 classes in the Japanese sample and 4 classes in the Indonesian sample. No employed cleaning staffs were employed in Japanese school while four cleaning service were employed in Indonesian school.

TABLE II. SCHOOL CHARACTERISTICS AND AVAILABLE PRACTICAL ENVIRONMENTAL EDUCATION

No.	Characteristics	Japanese School	Indonesian School
1	School location	Ono City, Hyogo	East Jakarta, Jakarta
2	Number of students (per grade)	150	96 - 128
3	Grade 6 student capacity (per classroom)	< 40	< 32
4	Number of cleaning staff	0	4
5	Person in charge of school's cleanliness	Teacher	All
6	Cleaning routine by students (per day)	15-20 minutes	Flexible; after school
7	Extensive cleaning	Once a semester	Twice a week

The extensive cleaning which is known as *osoji* is conducted once a semester in the Japanese school. On the other hand, the extensive cleaning called *operasi semut* was conducted at the end of calisthenics or morning prayer every twice a week. Hence, the intensity of school cleaning through *gakko soji* is applied to almost all students equally due to its standardized curriculum. Meanwhile, the intensity of school cleaning activity in Indonesian school varies depending on the homeroom teacher and individual initiatives.

### B. Environmental Efficacy Scores

TABLE III. DESCRIPTION OF ENVIRONMENTAL EFFICACY SCORE AMONG INDONESIAN STUDENTS AND JAPANESE STUDENTS

No.	Characteristics	Grade 6 Japanese Students	Grade 6 Indonesian Students
1	Mean	24.761	27.622
2	SD	2.9697	3.403
3	Variance	8.819	9.243
4	Minimum	17.4	18.4
5	Maximum	33.4	32.4
6	Range	14	16

There were 102 students in total from the both groups. Each group consists of 26 girls and 25 boys. The average environmental efficacy score of Japanese students and Indonesian students are 24.761 and 27.622 respectively. The Indonesian's average score is higher than Japanese's average score. The mean difference was statistically significant ( $p < 0.001$ ) with 95% of Confidence Interval. Although Indonesian students' average score is higher, the score variance is slightly lower among Indonesian students (Table III.). Nevertheless, both average

environmental efficacy scores in Japanese students and Indonesian students are within the sufficient level.

## V. DISCUSSION

As seen in the result, the Indonesian school employs more cleaning staffs than the Japanese school even though Japanese school has greater capacity of students. This shows that the school cleaning in Japan mainly relies on students and teachers independently. The difference in the presence of janitors might result in different littering attitudes as the sense of someone will pick up the trash could increase the tendency to litter [29]. Among Indonesian students, the practice of school cleaning is also conducted through shifts with lower frequency than the Japanese students. The cleaning in Japanese's school is standardized and applied equal to all students while intensity of school cleaning in Indonesian school is still flexible depending on the teacher in charge on the day. Due to the foremost cleaning activity in *gakko soji* as observed, the Japanese students that experience *gakko soji* were predicted that they would manifest greater environmental efficacy. This is because *gakko soji* provides the chance to observe and practice the cleaning every day which relates to the concept that environmental efficacy could be constructed through mastery plan [14]. However, the result is not aligned to the prediction. This result can be analyzed from several perspectives. Firstly, although nominally the average score among Japanese's students are not higher than the score among Indonesian students, both scores still lie in the same level of environmental efficacy, which is the "sufficient" category. From this point of view, the result could be caused by the fact that the school cleaning activity in Indonesian school sample was well enough to produce sufficient environmental efficacy score. Secondly, there is a different understanding about the waste management issues among Japanese students and Indonesian students as such issues happen frequently in Indonesia but seen rarely in Japan. Based on several questions arose from some of the Japanese students, they seemed to be unfamiliar to waste management issues, such as the phenomenon of littering and accumulated trash in the environment. This might influence the score as stated by [17] efficacy could be influenced by the individual belief that he has the necessary information about the competency. Thirdly, the result might indicate that *gakko soji* affects other psychosocial determinants of anti-littering attitudes, such as locus of control, self-concept, or altruism [9].

Besides that, the score variance is higher among Indonesian than Japanese. This explains that the standardized cleaning activity of *gakko soji* might have affected the environmental efficacy more uniformly than the Indonesian counterpart. Furthermore, it is possible that the school curriculum is not the significant reason for the gap between littering attitude among Japanese and Indonesian, as there are other determinants of littering, such as the non-availability of trash bin nearby [12], [13], [18].

## VI. LIMITATION

It is inevitable that fallacy could occur in this research due to the sensitive topic. Furthermore, as a starting point of the study about the comparison of littering attitude among Japanese and Indonesian, this research uses a convenient sampling method. As a consequence, the result of this research is unable to be generalized to the actual condition. Therefore, further comparative research with larger sample numbers is required to investigate the association of *gakko soji* and littering attitude.

## VII. CONCLUSION

This research was conducted to compare the general environmental efficacy among 6 grade elementary students in Japan and Indonesia with one elementary school from each country. The result shows that the average score of environmental efficacy was slightly higher among Indonesian students than the Japanese students but still in the same category. Meanwhile, the score among Japanese students varied less than the Indonesian students. This indicates that *gakko soji* curriculum could implant standard and uniform environmental efficacy mostly equal to all students. This could link to the reason why littering happens less frequently in Japanese educational institutes than Indonesia educational institutes.

## CONFLICTS OF INTEREST

This research has no conflicts of interest with any parties. No parties are involved in funding the research.

## AUTHOR CONTRIBUTION

F.S. proposed the idea, implemented the data collection in Indonesia, and analyzed the whole data. N.T. implemented the data collection in Japan. N.J.M. contributed in interpreting the result of data analysis to the paper.

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