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The Behavioral Intention to Implement Sustainable Waste Management on Primary School Students in City of Padang, Indonesia

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ABSTRACT: This study examined the behavioral intention to implement sustainable waste management on primary school students by using the framework of the Theory of Planned Behavior. The purpose of this study was to determine the factors associated with the behavioral intention to implement sustainable waste management. Population and sample in this study were primary school students in city of Padang, West Sumatera, Indonesia. The data collected for this study were analyzed using structural equation modeling. The results of this study stated that the knowledge of the sustainable waste management has a significant relationship with the attitudes towards the sustainable waste management behavior. Attitudes towards the sustainable waste management behavior, subjective norms, and perceived behavioral control also had a significant relationship with the behavioral intention to implement sustainable waste management. This study has helped in understanding the relative strength of the determinants of the behavioral intention to implement sustainable waste management. The biggest strength is the relationship between the perceived behavioral control and the behavioral intention, followed by the relationship between subjective norm and the behavioral intention, and the weakest were the relationship between attitude and the behavioral intention. These findings have important implications for the school as well as for policy makers.

KEYWORDS: Intention, Behavior, Sustainable, Waste, Management.

1 INTRODUCTION

International Global issues with respect to the future of urban areas one of them is municipal solid waste. The amount of waste as one of the important products of urban lifestyle, growing faster than the numbers of urbanization. Ten years ago there were 2.9 billion urban population generates 0.64 kg of waste per person per day (0.68 billion tons per year). Currently, the number of urban population has increased to about 3 billion people who produce 1.3 billion tons of waste per year. It is estimated that in 2025 the urban population will increase to 4.3 billion people and produced 2.2 billion tons of waste per year [1]. Then the future will be needed very large budget to improve waste disposal and treatment facility.

Waste that is not maintained properly not only have a negative impact on the natural environment, but also to the quality of human health [2]. Locally, waste is not collected contribute to flooding, air pollution and public health impacts such as respiratory diseases, diarrhea, and dengue fever [1]. A total of 80 percent of the spread of illness in the community in developing countries is believed to be associated with poor urban waste management system [3]. Residents around the landfill in Sierra Leone suffer from diseases such as malaria, chest pain, diarrhea and cholera [4]. This is by itself become an additional problem for the population in developing countries are still struggling with a lack of clean water and food availability.

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Sustainable Waste Management (SWM) stressed the need for a fundamental change of paradigm in waste management, from paradigm of collected-transported-disposed into paradigm of SWM which is based on waste reduction and waste handling. SWM is considered as an effective measure to reduce the cost of collecting, transporting, and disposing of waste [5]. SWM behavior is defined as efforts to reduce waste (reduce), reusing waste that is suitable to be used (re-use), recycling, and convert the waste into energy source (waste to energi).

Understanding and explain the SWM behavior can use the psychological theory approach on the relationship of attitudes and behaviors, especially a theory that can predict behavior. Theory of Planned Behavior (TPB) developed by Ajzen [6] widely applied to explain the intention of which is the nearest antesenden of behavior, that the intention or the intention of a person to be a determinant of whether someone will doing or not doing certain behaviors.

According to Ajzen [6], the behavioral intention to implement SWM is measured through three determinants. The first determinant related to the individual's attitude towards SWM behavior, The second determinant with regard to how much the perceived social pressure to implement such behavior (subjective norm), and third determinant related to the perception of its controls in relation to the such behavior are referred to as perceived behavioral control (PBC).

Cheung et al [7] in his research stating determinant factors of the TPB was significantly able to predict the behavior of waste-paper recycling at students in Hong Kong. While Chaisamrej [8] states determinant of TPB, especially the PBC and the subjective norm is a potential predictor of paper recycling. However, the attitude is not a potential predictor of intention to behave paper recycling in Thailand but being a predictor in the US.

Padang as the largest city in West Sumatra, Indonesia facing the problem of waste that needs serious handling, which waste generation continues to increase every year. Based on previous studies reference the average urban waste generation is 0.0035 m3 / person / day, equivalent to 0.9 kg / person / day. In 2013 with a population of 871 534 people are estimated daily amount of waste in the city of Padang reached 3.050 m3 (784 tons), while only 400 tons / day (51%) of the generated waste can be transported to the landfill. Waste that has not been transported generally accommodated in a temporary disposal container which is located on the edge of the road, the angle fork in the road or a particular road. That condition can lead to negative impacts on the environment, because it creates unpleasant odors, reduce the smoothness of traffic, reducing the beauty of the city, it can even become disease.

SWM behavior should be the concern of everyone, from children to adults, rich or poor. The establish of a SWM behavior in primary school student that oriented to sustainable development can be a role model for the SWM behavior in the family and the environment. The relationship between attitudes, subjective norms, and PBC with the behavioral intention to implement SWM and the relationship of knowledge about SWM with the students attitude towards SWM is a problem that want to be obtain the answered in this study.

2 METHOD

This study used survey method with cross sectional design in which data is collected throughout the study variables at the same time. The study was conducted in the city of Padang in August to December 2014. Population is a state primary school students in the city of Padang, amount to 77,406 students. The number of samples in this study were 400 students who calculated the proportion of the hypothesis test formula. Sampling technique with multistage random sampling.

There are five variables used, such as knowledge, attitude, subjective norm, PBC, and intention. Data collection was conducted by questionnaire and interview. Inferential analysis in this study using Structural Equation Modeling (SEM). SEM are statistical techniques that allow testing of a relatively complex set of relationships simultaneously [9]. SEM is a combination of factor analysis and regression analysis and applied separately in the factor analysis (Confirmatory Factor Analysis) or simply regression analysis [10]. Results of the analysis are interpreted and then concluded in accordance with the purpose of the study and were given advice.

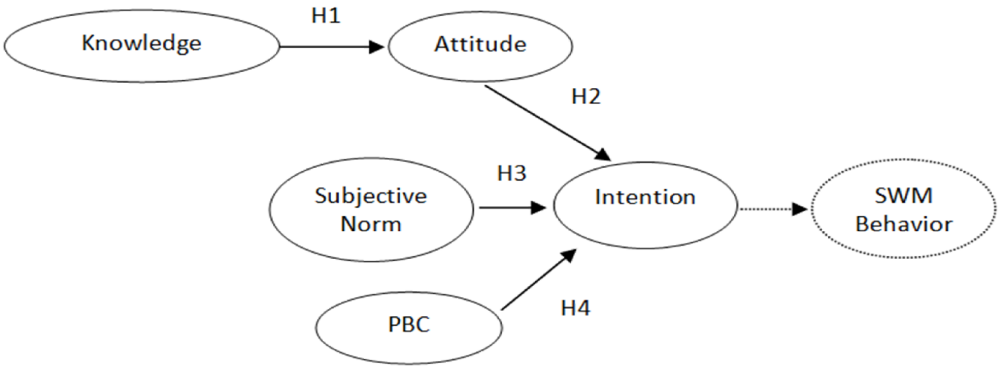

Figure 1 : Showing The Conseptual Framework of Study

In accordance with the purpose, this study measuring the variables of the TPB to understand the behavioral intention to implement SWM using SEM. First of all, this study examined the relationship between knowledge about SWM with the students' attitude towards the SWM behavior (Hypothesis 1). Furthermore, this study analyzed the relationship between attitude and the behavioral intention (hypothesis 2), subjective norm and the behavioral intention (hypothesis 3), and PBC and the behavioral intention (hypothesis 4) as shown in figure 1.

3 RESULT

A total of 400 respondents from four primary schools in the city of Padang participated in this study. 54.5% of respondents were female and 45.5% male. 80% of respondents came from the eco schools and 20% more not from the eco schools.

3.1 MEASUREMENT MODEL

Comparative analysis in this study follows the steps of SEM. Before forming Full Model of SEM, first testing the indicators that form each variable. Testing was done by using confirmatory factor analysis (CFA), which is used to test the validity and reliability of latent variables and indicators.

Table 1 shows the loading factor value for all items forming latent variables more than 0.5. This means that all indicators of these variables together present a unidimensional for each latent variable [10]. All of the Cronbach's Alpha (CA) values receipts exceed the limit of 0.7, and so does all of the variances extracted (VE) values acceptance limit of 0.5 [11]. Furthermore, based on confirmatory factor analysis, all of latent variables together all the indicator can be used for further analysis without any modifications or adjustments.

Table 1. Loading Factor, Cronbach's Alpha dan VE

Variable	Indicator	Loading Factor	Cronbach's Alpha	Varians Extract (VE)
Knowledge	Knowledge about reduce	0,742	0,83	0,56
	Knowledge about reuse	0,648		
	Knowledge about recycle	0,616		
	Knowledge about waste to energy	0,753		
Attitude	Waste can be processed and sold	0,638	0,90	0,64
	Make a narrow	0,782		
	Take time to learn	0,775		
	Requires a lot of people	0,640		
	School uniforms get dirty	0,766		
Subjective Norm	Teacher	0,880	0,92	0,70
	Head Master	0,817		
	Friends that discipline	0,688		
	Parents	0,766		
	School Guard	0,618		
PBC	Tools and materials are inadequate	0,663	0,84	0,56
	There is no special place for activities	0,605		
	There are no specific learning	0,621		
	trash bin are smelly and dirty	0,753		
Intention	Intention to reduce	0,730	0,89	0,66
	Intention to re-use	0,794		
	Intention to recycling	0,711		
	Intention to convert the waste to energy	0,730		

3.2 STRUCTURAL MODEL

SEM analysis was tested using AMOS 22 with maximum likelihood estimate (MLE). The test results are full model fit index showed sufficient conformity between the conceptual models with data obtained from the study as shown in Table 2. Value of Root Mean Square Error of Approximation (RMSEA), the absolute measure of the fit index parameters, equal to 0.06 within the tolerance limit of 0.08 [11]. The value of goodness of fit index (GFI) was 0.91 indicating acceptance within the tolerance limit of 0.90 [11]. Ratio of chi-square ($\chi 2$) and degrees of freedom (cmin / df) of 2.27 was obtained slightly above the cut-off value recommended [11]. In technical terms, these results suggest that there are no problems with the structural model. This means that this model can explain the intentions of SWM behavior in primary school students.

Table 2 : Goodness-of-Fit Test Index

Goodness of Fit Index	Cut off Value	Test Result	Evaluation
Chi Square	expected to be small	447,53	Marginal
Cmin/Df	≤2.00	2,27	Marginal
GFI	≥0.9	0,91	Good
TLI	≥0.95	0,92	Marginal
CFI	≥0.95	0,93	Marginal
RMSEA	≥0.08	0,06	Good

Results of analysis using the t test for regression weight generated by the model are presented in Table 3. All value of critical ratio (CR) which is identical with the t value in t-test > 1.96. This indicates received the whole model hypothesis in this study, which means that there is a relationship between knowledge and attitude and there is a relationship between attitude, subjective norm, and PBC with the behavioral intention.

Table 3 : Summary of Structural Model

Related			Standardized Estimate	CR	p-value
Attitude	<---	Knowledge	0,38	5,02	0,000
Behavioral Intention	<---	Attitude	0,19	3,61	0,000
Behavioral Intention	<---	Subjective Norm	0,23	4,00	0,000
Behavioral Intention	<---	PBC	0,40	5,96	0,000

4 DISCUSSION

Results of this study stated that knowledge of SWM associated and contribute positively with attitudes towards SWM. These results are consistent with theoretical assumptions of TPB [6] and in line with the findings obtained by Ramayah et al [12] which explores the behavior of environmentally conscious recycling by using the TPB.

These results are also consistent with the studies of Kumar [13] which states that environmental knowledge related to attitudes towards environmentally friendly products. Communication and education efforts to increase knowledge of the issues associated with environmental concerns has been effective in encouraging behavioral dispositions that are considered good for the natural environment [14]. The results also support the findings of Cheung et al [15] that the general knowledge about the environment can significantly predict the behavior of paper recycled. However, different results reported by Chaisamrej [16] that the knowledge about recycling fails to be predictors of intention and recycling behavior in students in Thailand and the United States.

Knowledge about SWM is measured by five indicators consisting of knowledge about reducing waste, reusing waste, recycling waste and convert the waste into energy. The findings of this study states the better the students 'knowledge, the better the students' attitude towards SWM. Need intensive and sustained effort from the schools to increase students' knowledge of SWM by including it as heavies in the curriculum of environmental education in schools.

Results of this study stated that the attitude towards SWM associated and contribute positively with the behavioral intention to implement SWM. These findings are consistent with theoretical assumptions in the TPB (6) that attitude is a determinant factor of intention. These results are also consistent with the results obtained with the same relationship and the same direction in the study reported by Chan and Lau [17] which stated attitude has a positive relationship with the intention to buy environmentally friendly products. Ramayah et al [12] in the results of his research on university students concluded that attitudes have a significant impact on recycling behavior. Similar results were also reported by Kumar (11), which examines the behavior of buying environmentally friendly products stating that attitude has a significant relationship with the intention to buy environmentally friendly products.

Attitudes towards SWM is measured by five indicators as elicitation results. Students are asked to comment in the range of strongly disagree to strongly agree to a positive statement is that sustainable waste management makes waste can be processed and sold. As for the negative statement, the students asked to comment in the range of strongly agree to strongly disagree with the statement that SWM make the place into a narrow, time-consuming to learn, requires a lot of energy, and causes school clothes become dirty. More and disagree with the statement the higher the students intention to implement SWM behavior. The attitude of the students who do not agree with negative statements about SWM can be used as motivation for students so that SWM becomes fun activity.

Results of this study stated that the subjective norm associated and contribute positively with the behavioral intention to implement SWM. Subjective norm which refers to perceived social demands to perform or not perform certain behaviors found influence and contribute positively to the intention to implement SWM behavior in this study. These results are consistent with the theoretical assumptions of the TPB (6) which states that the subjective norm as the determinant factor to apply or not to apply certain behaviors. These results are in line with the findings of previous research that states that subjective norm has a significant relationship with the intention as reported by previous researchers [13,15,16]

The findings of this study based on the results of elicitation and validity and reliability stating there are five valid indicator for assessing subjective norm which is the people who are considered may affect students in applying or not applying SWM behavior at school. These people are classroom teachers, headmaster, friend whose discipline and good behavior, their parents and school guard. School management and policy makers can take advantage of their potential to improve the students' intention to implement SWM behavior.

Results of this study stated that the PBC associated and contribute positively with the behavioral intentions to implement SWM. These findings support the assumption in the TPB [6] that the intention is influenced by subjective norms. These results are consistent with the results of Kumar. which states PBC has a significant relationship with the intention to buy environmentally friendly products. These results are also consistent with the findings Mahmud and Osman [18] which showed that the PBC has a positive and significant influence on behavioral intention of recycling. Similar results were also reported by Chaisamrej [16] that the PBC affects the behavior intention of recycling paper. Cheung et al [15] also stated PBC relate to the behavior of waste-paper recycling.

PBC has the most contributed to the behavioral intention to implement SWM, followed by the subjective norm and the lowest contribution is the attitude towards the SWM behavior. PBC is a consideration factors for the students that facilitate or inhibit themselves to implement SWM behavior. There are four indicators used to measure the PBC which tools and materials are inadequate, there is no special place to implementation of recycling activities at school, the lack of specific learning about SWM, and trash cans were smelly and dirty. School management and policy makers in the basic education sector should make a rational consideration of these findings as to improve students intention to apply SWM behavior.

Overall the model that uses the framework of TPB capable of explaining intention of SWM behavior with good approach with simple and adequate way for developing countries like Indonesia. Eligibility of the theory of planned behavior is consistent with the findings of Kumar [13] and Ramayah et al [12]. There is a scarcity of research that studies the relationship of environmental knowledge with attitudes towards environmental issues in the context of Indonesia although the same thing has been studied in other geographical conditions such as by Kumar [13] in India and Ramayah et al [12] in Malaysia. The study also managed to fill this gap.

5 CONCLUSION

This study uses a framework of TPB to investigate the behavioral intention to implement SWM on primary school students and its determinant factors. It is found that the better knowledge on SWM will be better attitudes towards SWM behavior. The better attitude towards SWM behavior the better the students' behavioral intention to implement SWM. Subjective norms as a reflection of social pressure from the people who are considered influential on students to apply or not to apply SWM behavior associated and contribute positively with the behavioral intention to implement SWM. PBC which is the perception of the ease or difficulty to implement SWM behavior are associated and contribute positively with the behavioral intention to implement SWM. The findings of this study support the concept of the TPB by adding constructs knowledge as a background's factor of formation of attitudes. Structural model of the behavioral intention to implement SWM on Primary school students in the city of Padang has good psychometric value (valid, reliable, and modeling fit).

The study provides a theoretical and practical implications of how attitudes, subjective norms, and PBC affects the behavioral intention to implement SWM. In efforts to implement SWM behavior on primary school students local governments should pay attention to the determinant of the behavioral intention to implement SWM and their former indicators.

The Measuring tools of the behavioral intention to implement SWM and its determinant factors on primary school students in the city of Padang can be used by policy makers to assess the factors that influence of implementing the SWM behavior in a practical, economical, valid and reliable. Other researchers can develop a structural model of the behavioral intention to implement SWM by adding other indicators that could theoretically affect the determinants of the behavioral intention such as race or ethnicity.

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