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# Influence of environmental value and attitude on student's intention to participate in a take back program

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**Abstract**

Mobile phone users in Indonesia are increasing continuously over the year. The Indonesian mobile phone users in 2015 reached 308.2 million, while the total population of Indonesia was 255.5 million, which means that mobile phone users has exceeded the number of inhabitants. One of a take back program goals is to preserve the environment. Participation of the consumers in a take back program will succeed the collection process as the first step in reverse logistics. This research studied the intention of consumers, especially university students to participate in the mobile phone take-back program based on the influence of their environmental value and attitude, using structural equation modeling. The survey was conducted on 184 university students in Indonesia. The results showed that the environmental value had positive and significant effect on the environmental attitude, but the environmental attitudes did not give significant effect on the student's intention to participate in the mobile phone take back program. These results can be used as a reference for mobile phone companies to implement a suitable take back program especially for university students.

**Keyword**: Environmental value, Environmental attitude, Student's intention, Take back program, Structural Equation Modeling (SEM).

## 1. Introduction

Mobile phone users in Indonesia are increasing continuously over the year. [1] stated that the increase of mobile phone users from 2014 to 2015 was at 9%. The Indonesian mobile phone users in 2015 reached 308.2 million, while the total population of Indonesia was 255.5 million, which means that mobile phone users has exceeded the number of inhabitants.

The growth of mobile phone users impacts to the increase of mobile phone waste, which is known as e-waste. Inadequate disposal of e-waste can harm the environment, but if it is managed properly, e-waste can be profitable. [2] argued that the increasing volume of e-waste was not only an environmental problem but also an economic opportunity.

Based on the survey conducted by Nokia [3] found that the public awareness to participate in a take back program for mobile phones recycling was still low. The survey showed that 70 percent of mobile phone users were not familiar with the mobile phone recycling program. Meanwhile, 3 to 4 percent of people who already found out about it did not even consider recycling their phones. About 88 percent of them were Indonesian.

The low response of mobile phone take back program was also found in the previous research of [4] that there was no respondent who have participated in the program. This phenomenon can be one of the obstacles for the successful implementation of mobile phone take back program in Indonesia.

Based on the Theory of Planned Behaviour (TPB) stated by [5] a person's behaviour is guided by values that are believed by him. These values will affect his attitude, and the attitude influence person's intentions and behaviour. Based on this theory, this study aims to determine the effect of environmental value and attitude on the university students' intention to participate in a mobile phone take back program. University students were

selected as respondents for the study in order to understand the intention of educated people toward the mobile phone take back program.

The literature study was performed to determine the existing studies on the environmental behaviour of educated people involving environmental value and attitude factors. The results of the literature study showed that most of the environmental behaviour models of educated people focused on green product buying behaviour as well as pro-environmental behaviour (PEB). The study on the environmental behaviour of educated people associated with the take back program has not been found.

The models of educated people's green product buying intention and behaviour were presented by [6-9]. [6] conducted a study to identify the factors that influence Indonesian university students' behaviour in purchasing green product and found that the environmental attitude had no significant effect on the behaviour. [7] analyzed the purchasing behaviour of environmentally friendly products, especially for post graduate and doctoral students in India. This study showed the results according to TPB that environmental value had influence on environmental attitude and the environmental attitude affected the behaviour. [8-9] examined the purchasing intention and attitude toward green electronic products. Both studies used lecturers in Universiti Sains Malaysia as the respondents. The difference of the two studies was the use of exogenous variable. [8] utilized perceived government legislation as an exogenous variable, while [9] employed self efficacy. [8] used environmental attitude as a mediating variable, while [9] made environmental attitude as a consequent variable, but the both studies did not involve environmental value. The result of [8] showed that environmental attitude did not act as a mediating variable between independent variables and purchasing intention.

Moreover, [10] identified influential factors on green purchasing behaviour for university student in Bandung, Indonesia. [11] Developed a model of environmentally conscious purchasing behaviour for university students in Turkey. Meanwhile [12] investigated students' intention to purchase organic food in Iran. The studies of [10-12] showed that the environmental attitude affected the purchasing intention and behaviour. In addition, [11] also found that the environmental value influenced the environmental attitude.

The studies on PEB were conducted by [13-21] & [13] Developed a model that described a behaviour related to environmental sustainability for students at the Middle East Technical University of Turkey. Meanwhile, [14] conducted a study comparing the intention to conduct environmental behaviour among business students in the USA and Chile. [15] described the impact of student background on some environmental responsibility behaviour. The study was conducted for university students in Turkey. [16] explored the relationship between Malaysian university students' knowledge, attitude and practice of the environment. Moreover, [17] assessed the environmental attitude in relation to responsible environmental behaviour among students pursuing B. Ed degree from University of Calcutta, India. [18] studied the influence of environmental knowledge on pro-environmental behaviour among university students from USA, Spain, Mexico, and Brazil. Further, [19] examined the difference between the attitude and behaviour values among engineering students in first, third and sixth year. This study was conducted in Chilean University. [20] investigated the influence of USA university students' attitudes and other variables on environmental sustainability intention and behaviour. Meanwhile [21] explained the relationship between environmental attitudes, environmental responsibility, environmental concern, and environmental knowledge as well as outdoor activities. The university students of Middle East Technical University (METU), Ankara, Turkey, were chosen as respondents. From those studies only [21] which showed the influence of environmental knowledge on the environmental attitude. Meanwhile, from [13, 19, 20 & 21] could be found that the environmental attitude influenced the environmental intention and behaviour.

Moreover, [22] studied the PEB for business students in USA and Chile to compare three theories: Ajzen and Fishbein's theory of reasoned action, Schawartz's norm activation theory, and the values-beliefs-norms theory created by Stern, Dietz, Abel, Guagnano, and Kalof. This study showed that the USA students' environmental attitude affected the behavioural intention, while Chile students' environmental attitude did not significantly affect the behavioural intention. Meanwhile, the studies on PEB especially for recycling behaviour were done by [23 & 24]. [23] identified the factors influencing the recycling behaviour. The data was collected from the students of COMSATS Institute of Information Technology, Pakistan. [24] Investigated the main internal factors that influenced recycling activities among university students in Spain. It was found in [23] that environmental knowledge affected the environmental attitude, as well as the environmental attitude impacted towards recycling behaviour. As in [24] environmental attitude did not affect the recycling behaviour.

The study of students' PEB activity especially the intention to use bioenergy was performed by [25]. It was conducted for high school students in Finland and India. Furthermore, [26] predicted American and Korean students' intentions to participate in the activities that can help mitigate a climate change. [27] Compared the influence of implicit attitudes and explicit attitudes on environmental behaviour among undergraduate students in Washington University. In the studies of [24-26] showed that

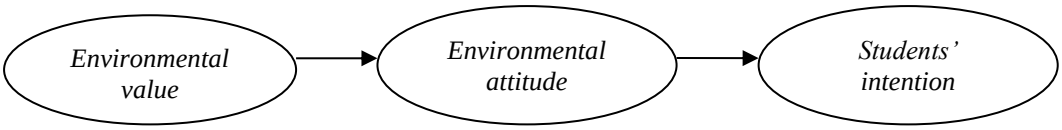


**Figure 1** Research model

environmental attitude had a significant influence on the PEB.

From the literature study of the educated people's environmental behaviour, it seems that it has not been found any studies that discuss the behaviour of educated people related to the take back program, so the study is still needed. Likewise, it needs to be investigated how environmental value and attitude influence the Indonesian university students as the educated people to participate in the take back program, given the results of [3] that it was still a few people of Indonesia who aware to participate in the program.

## 2. Materials and methods

### *2.1. Research model and hypotheses*

The research model of the influence of environmental value and attitude on student's intention to participate in a take back program is shown in Figure 1. The detail discussion of the effect of environmental value on the environmental attitude, and the influence of environmental attitude on the intention to behave may be found in [28]. Furthermore, the hypotheses of this study are:

H1: environmental value has positive and significant effect on environmental attitude.

H2: environmental attitude has positive and significant effect on students' intention to participate in mobile phone take back program.

### *2.2. Research methods*

The stages of research included: (1) distribution of the initial questionnaire to the students, (2) the validity and reliability test of the initial questionnaire used SPSS 16, (3) distribution of the formal questionnaire to the students, (4) confirmatory factor analysis (CFA) used AMOS 19, (5) model development of structural equation modelling (SEM) used AMOS 19.

The questionnaire development for the environmental value was drawn from [29], for the environmental attitude was retrieved from Kilbourne and Pickett (2008) in [30], while for the students' intention was adapted from [5].

## 3. Results

The questionnaires were distributed in May 2014. Initial questionnaires were distributed to 70 respondents for testing the validity and reliability of the questionnaires. Once the questionnaires were valid and reliable, it distributed further to get a sufficient number of respondents for this study. Finally, a total of 184 university students from various majors were used as respondents in this study.

### *3.1. Reliability and validity test result*

The tests were conducted on 70 respondents. The reliability test was conducted to test the internal consistency, i.e. the consistency of questionnaire items in measuring a latent variables. Based on [31] if the value of the cronbach α in the reliability test was less than 0.6, then the latent variable was removed. The results showed that the coefficient cronbach α of 3 latent variables were more than 0.6, which meant all the factors were reliable.

The validity test was intended to determine whether the items of the questionnaire were able to measure what you want to measure. This test was performed by comparing the value of 'item to the total' with r table product moment value. For N = 70, r tables product moment value with the 5% significance level is 0.235. The results showed that the 'item to total' value for the 2$^{nd}$ item of environmental value was less than 0.235, so the item was invalidated. Meanwhile, other items were valid.

### *3.2. Confirmatory factor analysis* (CFA) *result*

There is no general agreement in determining the factor loading cut off value on the CFA [32]. The loading factor in this study was determined as more than 0.4. The model fit of exogenous variables CFA was obtained at p=0.540; $\chi 2$=1.232; GFI=0.997; and RMSEA=0.000. The result showed that the 1$^{st}$ item of environmental value should be deleted.

The model fit of endogenous variables CFA was occurred at p= 0.356; $\chi 2$=34.350; GFI=0.964; and RMSEA=0.021. There were two items should be removed from the environmental attitude those were the 3th and 4th items.

*3.3. Structural model result*

The model achieved an overall fit with p value=0.099; $\chi 2$=60.970; GFI=0.935; and RMSEA=0.042. The model output is shown in Figure 2. The regression weights and the squared multiple correlations are presented respectively in Table 1 and 2. Table 1 showed that the environmental value had a positive and significant impact on the environmental attitude at the level of 0.01 ($\beta H_1$=0.374; p=0.008), thus H1 was proven. Meanwhile, the influence of

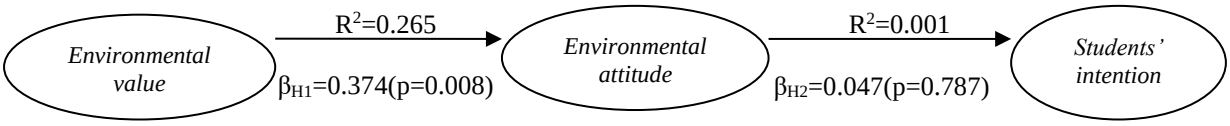


**Figure 2** Model output

**Table 1** Regression Weights

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| Environmental_attitude | <--- | Environmental_value | .374 | .142 | 2.639 | .008 | par_9 |
| Students'_intention | <--- | Environmental_attitude | .047 | .174 | .270 | .787 | par_10 |

**Table 2** Squared Multiple Correlations

| | Estimate |
|---|---|
| Environmental_attitude | .265 |
| Students'_intention | .001 |

environmental attitude on the students' intention to participate in the mobile phone take back program was not significant ($\beta H_2$= 0.047; p=0.787), so this research could not prove H2.

From Table 2 it can be seen that the environmental value has a role of 26.5% in shaping the environmental attitude. Meanwhile the environmental attitude as an anticedent of students' intention has a role of 0.1%.

**4. Discussion**

The positive and significant impact of the environmental value on the environmental attitude meant that the environmental values understood by the students were able to influence the attitudes of students towards the environment. This result is consistent with the TPB, where the values believed would encourage a certain attitude that is guided by these values [5]. Likewise, this result is in accordance with the research of [7, 11, 21 & 23].

Considering the result of the study that environmental attitude did not significantly influence the students' intention to participate in the mobile phone take back program meant that environmental attitudes held by students were not able to push their intention to join the mobile phone take back program.

This result did not correspond with the TPB, that a person's attitude affects his/her intention behaviour [5]. Similarly, this result did not conform with the research in [7, 10 - 13, 19 - 22] especially for USA students, [23, 25 - 28]. However, the research result was consistent with the findings in [6, 17, 18 & 22] especially for Chilean students, and [24], which showed that the environmental attitude had no significant effect on environmental behaviour. Based on Vermeir and Verbeke in [18] this result was not surprising because according to them, the environmental attitude was not a good predictor for environmental behaviour. Likewise, it could be observed in this study that the role of environmental attitude in shaping students' intention was very small ($R^2$ = 0.001), so it is still possible there are other factors that can affect students' intention.

Seeing these results, there is a possibility that students assume that the mobile phone take back program has no relation with the preservation of the environment, but it is merely a matter of business. Given this phenomenon, it is necessary for mobile phone companies which implement a take back program to inform their consumers about the benefits of take-back program for environmental sustainability. It can be done by working with the government to promote environmental conservation activities that involve college students.

Meanwhile by looking at the low values of squared multiple correlations on environmental attitude and students' intention, it can be said that there are other factors forming environmental attitude and students' intention. It is necessary for further research, in order to explore other factors that may influence environmental attitudes and students' intentions to participate in the mobile phone take back program.

## 5. Conclusions

In summary of this research, it can be concluded that the environmental value had a significant positive effect on the environmental attitude. Meanwhile the environmental attitude had no significant effect on the students' intention to participate in the mobile phone take back program. So, even though the environmental value could affect the students' environmental attitude, but because of the environmental attitude could not drive the students' intention to participate in the take back program, it is necessary for further study to investigate other factors that may affect the students' intentions.

## 6. Acknowledgements

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