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Factors affecting the intentions to implement a no plastic policy in Cotabato City, Philippines

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ABSTRACT. Plastic materials are one of the contributors to environmental problems. The detrimental effects of plastic pollution on the environment and human health are well established. Currently, the Philippines has been considered one of the countries which have high plastic loads which are mostly mismanaged. Although several measures and policies were already laid down, however, these were not properly implemented. Thus, determining the factors that may affect the proper implementation of pro-environmental policies is very important to mitigate the effects of plastic pollution. In this study, the factors affecting the intentions to implement the no-plastic policy among the junior high school students at Notre Dame University, Cotabato City were investigated. This study applies the Theory of Planned Behavior (TPB) and employs Structural Equation Model (SEM) to determine the factors affecting the intentions to implement a no-plastic policy. A total of 210 students were randomly surveyed in this study. Results showed that attitude (ATT) and subjective norms (SN) were found to have no significant direct effect on implementing the no-plastic policy. School administrators and policymakers should come up with plans and programs that may boost the students' attitudes and subjective norms to improve their intention to implement a no-plastic policy. Conduct further studies that widen the target respondents such as tertiary students to validate the results of this study.

Keywords: *environmental conservation, plastic pollution, pro-environmental policy, structural equation model, waste management*

INTRODUCTION

Plastic production has reached a massive global scale recently and had significant implications for the environment and human health (Organization for Economic Cooperation and Development [OECD], 2022). The production and disposal of plastic materials led to widespread concern about plastic waste management and its immediate environmental impacts (Walker and Fequet, 2023). Developing countries have high domestic demand for plastic products and packaging, and this leads to the importation of plasticmaterials from developed countries (Wang et al., 2022). However, developing countries may lack proper waste management infrastructures or resources which may only result in the mismanagement of plastic waste (Ncube et al., 2021). Currently, plastic materials are the main contributors to environmental problems that affect the environment and the health of living organisms (Koelmans et al., 2019). Plastic pollution is an environmental burden, especially in the aquatic ecosystem that negatively affects the wildlife due to prolong biophysical breakdown (Jambeck et al., 2015). Unfortunately, the detrimental effects of pollution are not only limited to wildlife and the environment (Alabi et al., 2019), it can also have negative effects on human health (Swan, 2008).

The Philippines generates 2.7 million tons of plastics per year and 20% of it ends up in waterbodies (World Bank Group, 2021). And this problem in the country has been attributed to an increase in population accompanied by unmanaged disposal of plastic materials (Leberton). The unregulated disposals of these types of materials in different ecosystems are likely due to the sachet economy (Ritchie and Roser, 2019). Recently, several studies conducted in the country showed the devastating presence and different polymer types of plastics in both land and marine environment (Galarpe and Parilla, 2014; Paler et al., 2019; Bucol et al., 2020). To address this problem, the Philippines have enacted several policies regulating the utilization of plastics, which were implemented at both national and local levels (Amurao, 2019). In 2018, the Department of Environment and Natural Resources (DENR) listed three-hundred sixteen (316) local government units (LGUs) that have ongoing ordinances that regulate or ban the use of plastic bags in their respective area. In 2021, the Philippine legislative house passes a prohibition act that disallows the use of single-use plastic products (Cruz, 2021). This bill if passed in the Philippine Senate can help solve the problem of plastic pollution in the country.

The unregulated disposal of plastic has been a problem in the country and to address this, several policy tools had been implemented. One of the most common policies that have been a go-to in addressing unregulated plastic disposals is the prohibition of the use of plastic bags or the "no plastic policy". This policy bans a particular type or combination of single-use plastics (UNEP, 2018). In Cotabato City, this policy had already been implemented and banned the use of plastic bags in the purchase of goods in all business establishments (Fernandez, 2019). Due to this, different institutions in Cotabato City also followed the "no plastic policy" ordinance, especially Notre Dame University (NDU).

For a pro-environmental policy to be successful, the intention to implement should be recognized and ensured. Thus, to ensure the success of the pro-environmental policy implementation, it would be necessary to determine the factors that may affect the people's intention to implement it (Hudson et al., 2018). In the current paper, the Theory of Planned Behavior (TPB) was used to determine the factors affecting the intentions of the respondents to implement a "no plastic policy". In this theory, attitude,social norms, and perceived behavioral control are factors that determine the intention to implement a certain behavior (Ajzen, 2020). This study determines the factors affecting the intentions of junior high school students at Notre Dame school students at Notre Dame

University to implement a "no plastic policy" using the TPB. Different factors were considered in this study, these are attitude (ATT), social norms (SN), perceived behavioral control (PBC), intention (IN), and pro-environmental behavior (PEB). These factors were investigated using the structural equation model (SEM). The results of this investigation will be beneficial to both the administrators of Notre Dame University and the local government units (LGUs) as it lays down the possible factors that may affect the implementation of the "no plastic policy" ordinance and come up with research-based programs that may enhance the administration of this policy.

MATERIALS AND METHODS

Questionnaire Design

A standard questionnaire was used to obtain the data needed for identifying the factors affecting the intention of junior high school students at Notre Dame University to implement a "no plastic policy". The questionnaire of the study consisted of three parts: 1) a cover letter that included the title and purpose of the study,as well as mentioning ethical issues regarding the confidentiality of the participant's answers. 2) demographic characteristics and 3) the components of the TPB. The face and content validity of the questionnaire were obtained through an expert panel and their comments were also applied. Furthermore, a pre-test was conducted with 30 individuals Browne, 1995) before the survey, and based on that, the questionnaire was adjusted. After the pre-test, the reliability of the questionnaire was determined by calculating Cronbach's alpha coefficient, then followed by exploratory factor analysis (EFA) to ensure the internal consistency of the items. A five-point Likert scale was employed to evaluate each latent variable (1 – Strongly disagree to 5 – Strongly agree).

Respondents of the Study

The statistical population of this survey research includes all the junior high school students at Notre Dame University, Cotabato City. The sample size was estimated using the sample size calculator for structural equation models as suggested by Soper (2022). Based on the sample size calculator (Soper, 2022), the minimum number of respondents to run the TPB model in this study was 200 respondents. Stratified random sampling was used in this study and the differentiation in grade levels was considered as separate strata. Therefore, four (4) groups were established based on the number of grade levels. A total of 250 survey questionnaires were sent to random respondents. However, only 91% of the respondents answered the survey questionnaires. Then, during the data clearing, 17 responses were omitted due to some items were not answered and some were considered multivariate outliers. Thus, a total of 210 responses were considered valid and used for the SEM analysis.

Structural Equation Modelling

The SPSS 26 and AMOS 22 were utilized for the Structural Equation Modelling (SEM). SEM analyzed if the conceptual framework fits the observed data while simultaneously assessing the measurement error. The latent variables that were considered were: attitude (ATT), subjective norms (SN), perceived behavioral control (PBC), intention (IN), and pro-environmental behavior (PEB). The association of these latent variables was estimated. Several indices were also used to detemine the fitness of the model. The model was treated as workable if it achieved the recommended Goodness-of-Fit (GOF) measures.

RESULTS AND DISCUSSION

Descriptive Characteristics of the Respondents

The demographic of the respondents (Table 1) shows that 67.6% are female. The distribution of respondents based on grade level is highest in Grade 7 (26.7%) while least in Grade 10 (22.9%). In terms of religion, the majority of the respondents are Islam (72.9%).

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Table 1. Descriptive characteristics of the respondents (n = 210).

Variable	Category	Frequency	Percentage(%)
Gender	Male	68	32.4
	Female	142	67.6
Grade	7	56	26.7
	8	53	25.2
	9	53	25.2
	10	48	22.9
Religion	Islam	153	72.9
	Roman Catholic	53	25.2
	Iglesia ni Cristo	2	1.0
	Others	2	1.0

For the primary sources of pro-environmental information (Fig. 1), most of the respondents obtained their knowledge from the Internet (22%) while environmental groups (3%) and environmental experts (3%) were the least common source of pro-environmental information. The internet becomes the main source of information in the Philippines due to its ease of access and the vast amount of information available (Datareportal, 2023). The internet allows quick and easy access to information from various media and users may have easy access to vast information while saving both time and money (Apuke and Iyendo, 2018). Environmental groups and environmental experts are the least source of information can be attributed to lack of visibility which leads to capturing less public attention compared to more sensational content (Westerman et al., 2013).

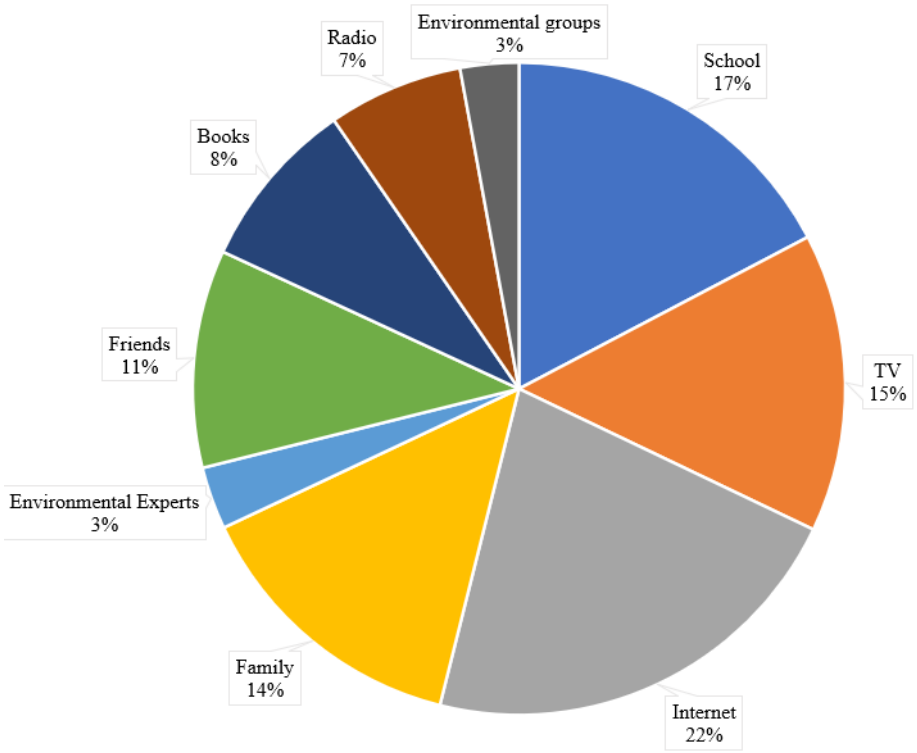

Figure 1. Primary sources of pro-environmental information of the respondents.

Factors Affecting the Intentions to Implement No Plastic Policy

The initial model used in this study is shown in figure 2. Modification indices processing was done to strengthen the model fit (Table 2). Figure 3 presents the final model for investigating the factors affecting the intentions to implement the no-plastic policy. Moreover, in table 3, results from Cronbach's alpha (α) showed that the set of items used to measure the latent variables have high internal consistency (α ≥ 0.80) (Taber, 2017). Results from the Composite Reliability (CR) show that all items used to measure each latent variable indicate a satisfactory internal consistency (CR ≥ 0.70) (Bacon et al., 1995). The Average Variance Extracted (AVE) is used to evaluate the convergent validity of the latent variables in this study. Table 3 shows that the AVE values of all latent variables indicate an adequate convergent validity (AVE ≥ 0.50) (Hair et al., 2021).

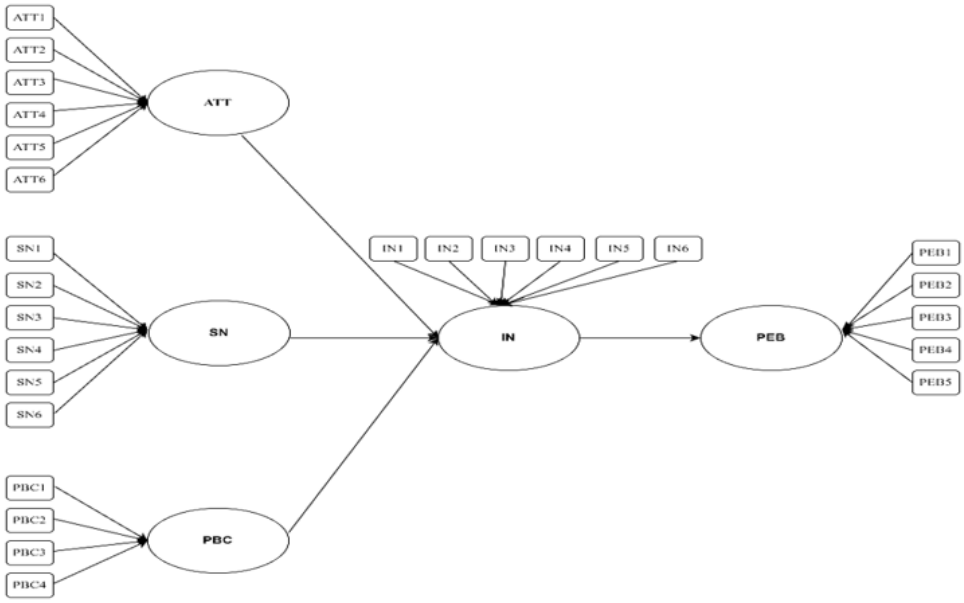

Figure 2. Initial SEM model.

Upon the analysis of the results of the SEM, it was found that only the Perceived Behavioral Control (PBC) (β =0.464, $p < 0.01$) is statistically significant and was able to describe the variation in the Intention to adopt no plastic policy (IN) (52.7%). The IN is also statistically significant towards Pro-environmental behavior (PEB) (β = .658, $p < 0.01$). However, the AT (β = .254, $p > 0.01$) and SN (β = .211, $p > 0.01$) are not statistically significant to IN. Thus, AT and SN do not play a significant role in the IN. Applying the theory of planned behavior, only the PBC has significant effects on the intentions of the junior high students to implement a no-plastic policy.

Table 2. Goodness of fit indices.

The goodness of fit measures of SEM	Parameter estimate	Minimum cut-off
Incremental Fit Index (IFI)	0.935	>0.80
Tucker Lewis Index (TLI)	0.920	>0.80
Comparative Fit Index (CFI)	0.934	>0.80
The goodness of Fit Index (GFI)	0.879	>0.80
Adjusted Goodness of Fit Index (AGFI)	0.838	>0.80
Root Mean Square Error (RMSEA)	0.066	<0.07

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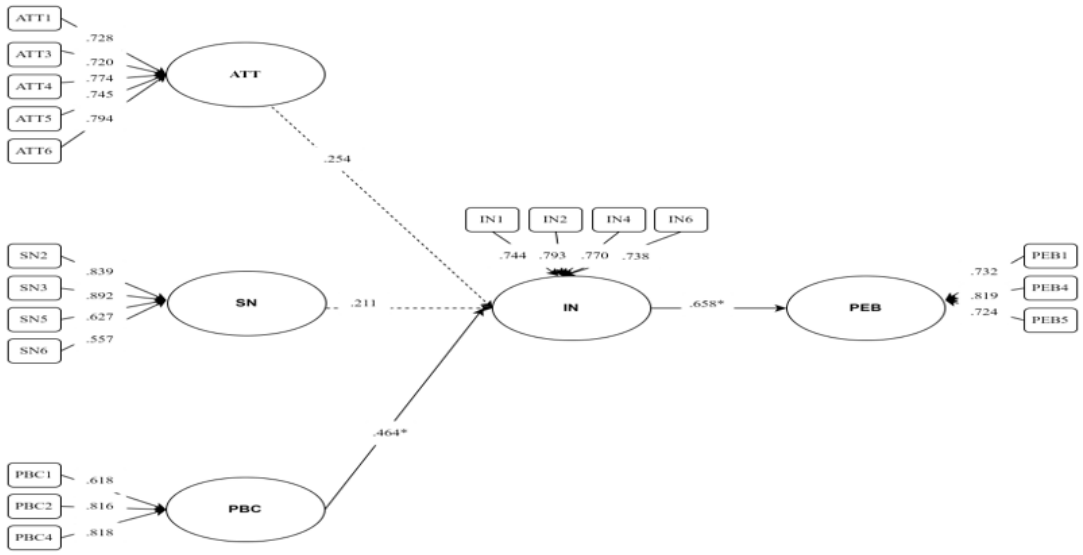

Figure 3. The Final SEM model.

Based on the results of this study, only the PBC has a significant direct effect on the intention of the students to implement a no-plastic policy. PBC is the measure of a person's perception of the degree they have over the performance of behavior (Ajzen 2005). Moreover, these variable measures the perception of the respondent's control over when performing a behavior, and this serves as a proxy for doing that actual behavior (Chen and Chai, 2010). Since the respondents of this study have a significant PBC towards IN, this would mean that they believed that they are in control of implementing a no-plastic policy. The higher PBC a student has over in implementing the no plastic policy, the more likely they adopt the policy (Ajzen, 2001).

Table 3. Convergent validity and measurement model.

Variable	Item	Final	Cronbach's alpha	Composite Reliability	Average Variance Extracted (AVE)
Attitude	ATT1	0.73	0.87	0.87	0.567
	ATT3	0.72			
	ATT4	0.77			
	ATT5	0.75			
	ATT6	0.79			
Subjective Norm	SN2	0.84	0.82	0.83	0.551
	SN3	0.89			
	SN5	0.63			
	SN6	0.56			
Perceived Behavioral Control	PBC1	0.62	0.79	0.80	0.572
	PBC2	0.82			
	PBC4	0.82			
Intention	IN1	0.74	0.85	0.85	0.592
	IN2	0.79			
	IN4	0.77			
	IN6	0.74			
Pro-environmental Behavior	PEB1	0.73	0.80	0.803	0.577
	PEB4	0.82			
	PEB5	0.72			

Interestingly, in most TPB studies, it would be expected that ATT would have the greatest impact on the IN, then followed by SN (Leeuw et al., 2015). However, this is not the case in this study. Regardless, the student's ATT towards implementing a no plastic policy is positive (mean on a scale of 1-5, with high numbers representing a positive attitude, 4.20). People will normally comply with rules, guidelines, and requirements if they have a positive attitude (Faiers and Neame, 2006; Presetyo et al., 2020). Attitude can affect the intention to implement a certain behavior (Verplanken and Orbell, 2022). A positive attitude toward reducing plastic utilization can lead to behavioral changes such as avoiding unnecessary plastic items and advocating for sustainable practices (Allison et al., 2022). The results of this study showed that ATT does not have a significant direct effect on IN. Thus, to improve the ATT of the students toward intention to implement a no-plastic policy, school administrators should focus on discussing the positive effects of implementing a pro-environmental policy in environment. Moreover, students should also participate in pro-environmental campaigns to boost their positive out look on any pro-environmental policies (Kumar et al., 2021).

In this study, SN also does not have a significant direct effect on IN. It is believed that an individual's behavior can be affected by the norm in the community (Ajzen, 2020). This variable depends on the cultural context and internal values in the community. Thus, SN would vary in different communities (Brookes, 2021). The results of this study showed that social pressure from the people surrounding the respondents does not significantly influence the implementation of the no-plastic policy. In other words, the respondent's impression is that most people around him may think that performing the no-plastic policy is not that important (Bang et al., 2000). Raising awareness and disseminating information about the beneficial effects of pro-environmental policies in the community are some approaches that can be utilized to improve the social norms of the students in implementing a no-plastic policy (Oguge et al., 2021).

CONCLUSION

This study is based on the Theory of Planned Behavior (TPB), seeking to identify and investigate the factors affecting the junior high school students' intentions to implement a no-plastic policy at Notre Dame University, Cotabato City. Based on the results of the study, only the perceived behavioral control (PBC) has a significant direct effect on implementing the no plastic policy. However, attitude (ATT) and subjective norms (SN) have no significant effect on implementing the no-plastic policy. To enhance the enforcement of the no plastic policy among junior high school students, the ATT and SN towards implementing the no plastic policy must be improved. Results from this study can be helpful to school administrators and policymakers to come up with research-based programs and plan to enhance the implementation of pro-environmental policies. Data from this research can also be used to advocate proper management of plastic disposals and raised public awareness towards the possible detrimental effects of plastic disposal mismanagement. This study is only limited to junior high school students, it is recommended to conduct further studies that widen the target respondents such as tertiary students to validate the results. It is also recommended to consider a qualitative research approach to support and verify the findings of this study.

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CONFLICT OF INTEREST

No conflict of interest in the study.

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