A CASE STUDY OF AN EDUCATIONAL INSTITUTION INVESTIGATING THE DETERMINANTS OF PEOPLE'S PERCEPTION OF PLASTIC CONSUMPTION

N T Nisha[1]*, I. M. Rafizul[2]

1Postgraduate Student, Department of Civil Engineering, Khulna University of Engineering & Technology (KUET), Khulna-9203, Bangladesh, email:nishattasnimnisha.bd@gmail.com
[2]Professor, Department of Civil Engineering, Khulna University of Engineering & Technology (KUET), Khulna- 9203, Bangladesh. email:imrafizul@ce.kuet.ac.bd

***Corresponding Author**

ABSTRACT

The extensive use of plastic has emerged as a significant global concern. Even so, consumption of plastic continues to rise steadily. A significant proportion of plastic garbage possesses the potential for recycling, rendering it a highly viable approach for addressing the littering of plastic. Nevertheless, plastic waste recycling rate is unelevated continuing to pose a significant threat to world stability and sustainability. To reduce this issue The only apparent option seems as to reduce plastic consumption. To these attempts, the educational institute namely KUET campus has been considered for collecting data to understand people's behavior patterns. The survey research approach was utilized, and 200 data cases were gathered via purposive sampling. The data were subjected to analysis through Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS4 software and subsequently tested to evaluate the hypotheses. In this analysis, the Theory of Planned Behavior including attitude, social norms, and perceived behavior was utilized to assess the factors influencing the intention of consumption choice. The study results suggested that attitude and perceived behavioral norms construct significant impacts on individuals' intentions to engage in plastic consumption behaviors. Whereas social norms do not have any significant impact on the intention.

***Keywords**: Plastic Consumption, Plastic Waste, Theory of Planned Behaviour, Educational Institution*

1. INTRODUCTION

Plastic is a ubiquitous pollutant that harms the living organisms and hence the ecosystem and the environment (Kautish, 2018; Puskic et al., 2020; Soga et al., 2018). In the current period of technical innovation, there is a rapid emergence of products incorporating environmentally friendly elements. However, the issue of plastic waste continues to pose significant challenges to communities, irrespective of these advancements (Huysman et al., 2017). Modern societies significantly depend on plastic manufacture and consumption because of its physical advantages, which include cost-effective, diversified uses, lightweights, strength, formability, and bio-inertness (Nielsen et al., 2020; Sharma & Paço, 2021). In the recent industrialized and rising demand in the market, such as India, Pakistan, and South Africa, the production and consumption of single-use plastic, including, disposable items like plastic bottles, cutlery, and food packaging, has exceeded 15 billion metric tons over the span of four decades (Kautish & Sharma, 2020; Khan et al., 2019a). According to the World Economic Forum's report in 2020, it was emphasized that if the ongoing inclination of increasing plastic production and consumption persists, the volume of plastic entering the marine environment will triple by the year 2040 (Eckstein et al., n.d.; Fadeeva & Van Berkel, 2021). By 2050, more than 20% of the world's total crude oil consumption will be used for plastic manufacture (Dhir et al., 2021). Hence, reducing the use of plastic has become ubiquitous.

There have been numerous attempts to reduce the amount of plastic garbage produced. However, it is thought that the most effective is to avoid using plastic. The consumption nature, in this case the consumption of plastic material is related to people's behavioral trait such as personal habit, so the situation calls for shared tenacity among stakeholders to properly discuss plastic pollution as a worldwide capacity. It is thus inevitable to study people's behavioral pattern as to why people use plastic and what changes can be incorporated to change this behavior and the connection with the environment. (Kautish, 2018; Khan et al., 2019b). The majority of people including consumers exhibit a positive attitude towards the environment, demonstrate a consciousness of sustainability, and express a readiness to adopt a green lifestyle. However, they tend to display reluctance when it comes to purchasing products that are ecologically friendly (Arli et al., 2021). This psychological resistance, also known as the attitude-behavior gap, is caused by many factors; such as: variations in product priorities, consumer skepticism, high price perceptions, social desirability bias, and lack of necessary information (van Riper et al., 2020). The desire of consumers to engage in pro-environmental activities is significantly influenced by the relative relevance of their values and unique features. With that in mind this study is aimed at identify the connection between human psychological factors and their intention to consumption by hypothesis testing.

The theory of planned behavior (TPB) is a widely adapted method in various research to understand people's behavior (Chen & Tung, 2010a; Tonglet et al., 2004a). The hypothesis suggests a model to comprehend human behavior better. The variables utilized in theory to explain human behavior include attitude, subjective norms, perceived behavior, intention, and behavior. The three intentions-determining factors were anticipated by the TPB. The attitude toward the behavior is the first factor, the subjective norms are the second determining factor and the third is perceived behavioral control (Ajzen, 1991). This hypothesis has been used to understand consumer behavior in various sectors including environmental concerns and also non including environmental concerns (Alzahrani et al., 2017; Arora & Sahney, 2018). This hypothesis was also successful in testing waste management theories (Liao et al., 2018). However, to study the plastic consumption nature of people there seems to be a gap by testing this theory. With recent importance to understand the plastic consumption behavior this paper aims to test these hypotheses for plastic consumption behavior.

2. METHODOLOGY

2.1 Hypothesis Development

The selected theoretical framework for this study's hypothesis on behaviour patterns is the theory of planned behaviour. Theory of planned behavior (TPB) is derived from the Theory of Reasoned Action

(TRA) formulated by Fishbein and Ajzen in 1975. According to the theory, it is posited that the prediction of various types of behaviour can be derived from factors such as attitude towards behaviour, subjective norm, and perceived behavioural control. The Theory of Planned Behaviour (TPB) has been widely employed in numerous research focusing on environmental-related behaviours, as well as in the prediction of human behaviour (Wang et al., 2016; Xu et al., 2020a) Additionally, TPB has also been utilised to examine people's consuming behaviour (Riverso et al., 2023). In this study the three hypothesess derived from TPB is developed to indicate plastic consumption behavior of people.

2.1.1 Attitude

The concept of "attitude" pertains to an individual's cognitive evaluation and subjective judgement of a particular conduct (Ajzen, 1991). It is a natural inclination of human beings to exhibit either positive or negative responses towards certain objects (Gaiseanu, 2020). Attitude has influenced waste management in prior research. The recycling behaviour of e-waste among young consumers in the United Arab Emirates was found to be substantially predicted by their attitude (Aboelmaged, 2021). Attitude also outlines Finland's recycling practises for plastic packaging (Reijonen et al., 2021). There has also been found some dissimilarity of attitude and behavior in green purchase behavior (Xu et al., 2020b), and also plastic recycling behavior (Khan et al., 2019c) The attitude has three components(Naneva et al., 2020) The cognitive component, affective component and conative component. Among them the conative component is related to desire to act. It is used in market research to assess the intention to purchase or choose a certain brand in comparison to other buying behaviors (Agmeka et al., 2019). This study is aimed to testing attitude towards consumption behavior of plastic products.

2.1.2 Subjective Norms

Subjective norms are formed through normative beliefs, which involve individuals perceiving the social pressure to engage in specific behaviors. The impact exerted by an individual's family, friends, and immediate social environment contributes to the development of this pressure (La Barbera & Ajzen, 2020). Hence, a subjective norm refers to an individual's reaction to diverse societal forces and the information acquired during the decision-making process of each person (ALRasheedi, 2021). Subjective norms are frequently employed as an element of interest in numerous research studies that investigate human behavior (Matthew J. Mayhew et al., 2009; Poulter et al., 2008; Vining & Ebreo, 1992).Other research indicates that the subjective norm has no discernible influence (Jena & Sarmah, 2015; Mannetti et al., 2004). This study suggests subjective norms are important in explaining behavioral intention.

2.1.3 Perceived Behavioral Control

The level of control a person perceives they have over their behavior is known as perceived behavioral control. The two variables linked to behavioral performance are self-efficacy and perceived controllability (Ajzen, 1991). A group of conventionally accepted control variables can be utilized to assess an individual's impression of the potential ease or challenge of engaging in particular conduct (Tonglet et al., 2004). Second, a person's behaviour is also influenced by how much control they have over a particular behaviour. Numerous kinds of research have found that perceptions of behavioral control influence people's intentions and actions. Various research has indicated that a person's perceived behavioral control has a considerable beneficial influence on their behavioural intentions (Botetzagias et al., 2015; Chen & Tung, 2010b; Wan et al., 2014) Based on the results from previous studies this study considers perceived behavioral control as an important predictor of plastic consumption intention.

So, based on the variables of theory of planned behavior the developed hypothesis are
H1. Attitude (ATT) is related to people's behavior of plastic consumption
H2. Subjective norms are related to people's behavior of plastic consumption
H3. Perceived behavioral significantly influences people's behavior of plastic consumption

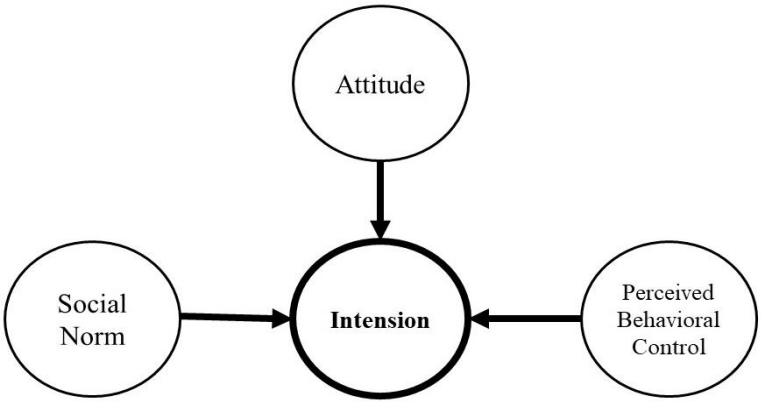

Figure 1: Hypothesis Testing Proposed Model

2.2 Questionnaire development

This study is employed by survey research design. A survey questionnaire was developed that indicated all the hypotheses and it was based on a five-point likert scale ranging from strongly disagree to strongly agree. The questionnaire had two parts, one describing the demographics and willingness to participate of the respondents and the other part were developed to test the hypothesis. The hypothesis testing part had 14 questions in total, with attitude, social norm, perceived behavioral control, containing 4 questions each, and 2 question to identify intentions. The questionnaire was developed taking ideas from previous studies (Chu, 2003; Davies et al., 2002; Domina & Koch, 2002; Knussen & Yule, 2008).It was then validated by expert opinions and examined from pilot testing before data collection. The questionnaire was sent to the targeted sample for data collection after it satisfied the reliability standards from the pilot scale.

The technique of intentional sampling was utilized because it helps with the generalizability of the findings when data from samples that appropriately reflect the community are obtained. This study focused on plastic consumption intentions on the campus and the majority of campus population are students who generate significant amount of plastic waste. Thus the students were only considered as targeted participants for this study. Although the faculty members, and officers residing in the campus are also responsible for a significant amount of plastic waste, for this particular study they were not considered as targeted participants in this stage. However, more extensive studies and hence analysis will then be considered with whole participants.

Table 1: Questionnaire developed from hypotheses

Hypothesis	Constructed question
Attitude	Using plastic is good for the environment
	Using plastic is good for the society
	People should regularly use plastic
	It is possible to stop using plastic
Social Norms	Most of our neighbors avoid using plastic
	Most of our relatives avoid using plastic
	Most of our colleagues/friends avoid using plastic
	Most of the similar society such as ours avoid using plastic
Perceived Behavioural control	I mostly avoid buying plastic material
	I mostly avoid taking single use plastic from the market
	There are enough resources to alternate plastic use
	I know how to stop plastic consumption
Intension	I intend to avoid using plastic
	I intend to avoid buying plastic

2.3 Data Analysis

The constructs of the questionnaire and the structural correlations among the constructs were validated using partial least square structural equation modeling, hereafter PLS-SEM (Gefen et al., 2000). Since PLS-SEM can be used for a relatively small sample size and is suited for better theory development (Joreskog & Wold, 1982), this tool was considered to be more appropriate for the purpose of the study. The PLS SEM analysis was carried out by the SmartPLS software version 4. The initial step in validating the data and measurement model involves assessing convergent validity and discriminant validity. Following this, hypothesis testing was conducted. In this analysis, the hypotheses were put as constructs and a path model was developed. In this analysis, attitudes, Social norm, Perceived behavioral control and intentions were considered as constructs. Under each construct, the questions from the questionnaire were put as latent variables. In addition, by indicator, the defined relationship was constructed. After that, the structural equation modeling was applied to measure the relationship among the constructs. The constructs model including paths are shown in Figure 2.

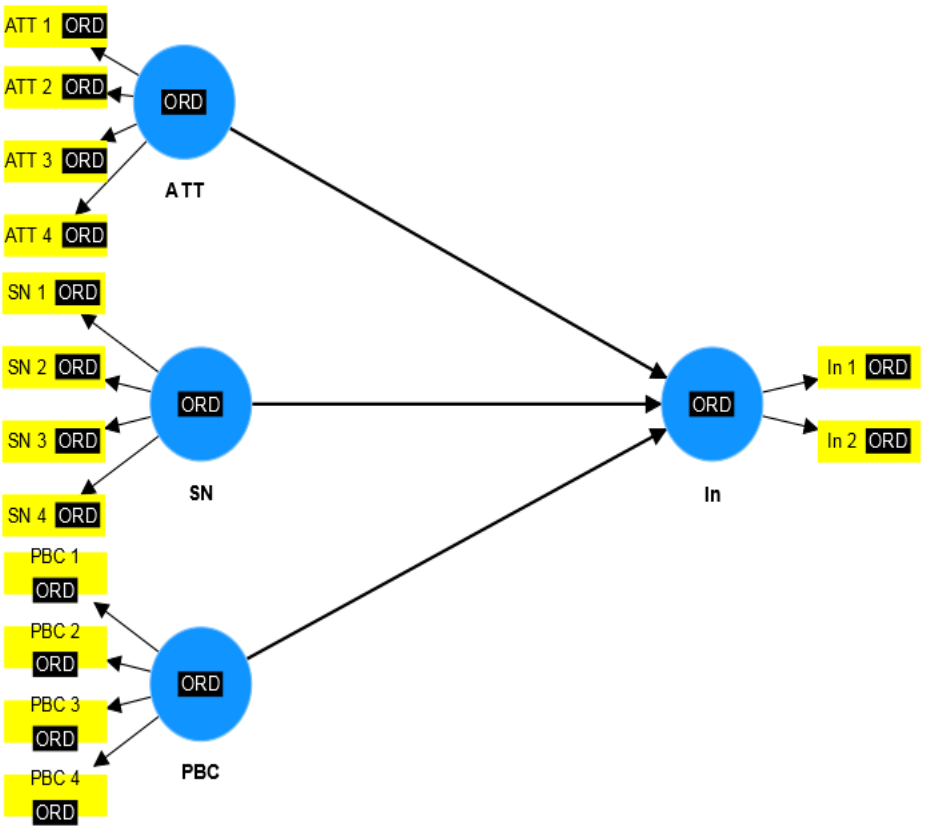

Figure 2: Model for construct of questionnaire

3. RESULTS AND DISCUSSION

The PLS SEM method consists of two elements; the outer model and the inner model. The outer model describes the relationships between measurement variables and latent variables, and the inner model also called as structural model describes the relationships between latent variables.

3.1 Outer Model Measurement: Reliability and Validity

The outer model measurement involves evaluating the reliability and validity of the data. The reliability measure includes the internal consistency analysis whilst the validity includes evaluating convergent and discriminant validity. The reliability testing can be done using

Table 2: Reliability and Validity Testing

Construct	Items	Loadings	CR	AVE
ATT	ATT 1	0.855	0.727	0.522
	ATT 2	0.747		
	ATT 3	0.868		
	ATT 4	-0.213		
IN	In 1	0.972	0.971	0.944
	In 2	0.971		
PBC	PBC 1	0.81	0.755	0.481
	PBC 2	0.887		
	PBC 3	0.675		
	PBC 4	0.16		
SN	SN 1	0.845	0.942	0.801
	SN 2	0.894		
	SN 3	0.917		
	SN 4	0.922		

composite reliability and Cronbach's alpha. However, Composite reliability, in contrast to Cronbach's alpha, does not consider that all indicators are equally reliable, which makes it more appropriate for PLS-SEM, which prioritizes indicators based on their dependability during model estimate (Hair et al., 2011). So, in this study composite reliability is used as it provides better measure of internal consistency (F. Hair Jr et al., 2014). The composite reliability value is shown in table 2. It is advised to use 30% of the original sample to holdout sample. So, the reliability for all variable should be greater than 0.7 (Hair et al., 2011). Convergent validity can be measured from average variance extracted. The threshold for the AVE should be 0.5 or more and factor loadings for convergent validity should be above 0.7 (F. Hair Jr et al., 2014). The table 1 also shows the values of AVE and also the loadings of the variable. Most of the loadings are above 0.7. The degree to which a construct differs from the other constructs is measured by its discriminant validity. A comparison of the AVE values with the constructs' correlation coefficients shows that the discriminant validity is valid. It is assumed that the variable has excellent discriminant validity if the square root of the AVE value is greater than the correlation coefficient (Fornell & Larcker, 1981). An alternative method for establishing discriminant validity involves examining the cross loadings. In order to establish construct validity, it is crucial that the cross loadings of each item on its own construct are higher than the cross loadings on other constructs. Table 3 presents the cross-loading results, confirming validity.

Table 3: Cross Loadings

	ATT	IN	PBC	SN
ATT	0.722			
In	-0.539	0.972		
PBC	-0.188	0.539	0.693	
SN	-0.049	-0.050	0.246	

3.2 Inner Model Measurement: Structural Model

In this study, there are three hypotheses which were examined through structural equation modelling. The results are represented in table 4.

From the results it can be seen that attitude (beta=3.341, $p<0.001$) has a moderate positive influence on intension to consume. Perceived behavioral control (beta=3.332, $p<0.001$) also has similar impact

on intension behavior. So that confirms hypotheses H1 and H3. However, for social norm the p value is too high to have an impact.

Table 4: Inner Model Measurement

	Original Sample	Sample Mean	Standard Deviation	T statistics	P value
ATT -> In	-0.455	-0.446	0.137	3.314	0.001
PBC -> In	0.502	0.493	0.151	3.322	0.001
SN -> In	-0.196	-0.165	0.135	1.449	0.147

4. CONCLUSIONS

PLS SEM is an emerging tool which is being used to understand the behavioral pattern of human in different situation. The primary objective of this research was to determine if theory of planned behavior is applicable to the human behavior of the consumption of plastic. A questionnaire was developed accordingly and was tested in the SmartPLS 4 software by PLS SEM method. From the reliability and validity testing cronchbachs alpha and AVE shows satisfactory values that validates this study. It can be concluded that the questionnaire developed for the hypotheses are strong enough to verify the hypotheses developed can be properly tested. And after testing the inner model and measuring the P value and beta value as per literature the results from inner model shows direct impact of attitude and perceived behavioral control towards the intention of purchasing. However, social norm data shows it does not impact consumption intention directly. So it can be concluded that to change the general consumption nature of people for plastic, attitude and perceived behavioral control needs to be changed.

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