

The Influence of Digital Literacy and Product Innovation on The Competitive Advantage of Modern Beverage Businesses

Henny Henny

Universitas Komputer Indonesia, Bandung, Indonesia

Agus Heri Setya Budi

Universitas Pendidikan Indonesia, Bandung, Indonesia

Maretno Marcelina Baru

Universitas Komputer Indonesia, Bandung, Indonesia

Arcellia Citra Dewi Gumilar

Universitas Komputer Indonesia, Bandung, Indonesia

Alias Masek

University Tun Hussein Onn Malaysia, Malaysia

ABSTRACT

The purpose of this study is to analyze the influence of attitudes and perceived behavioral control on students' intentions in reducing the use of single-use plastic bottles by referring to the theory of planned behavior and its relevance to the sustainable development goals (SDGs) goal 14. The method used was quantitative approximation with a comparative study design of 32 respondents through a Likert questionnaire, tested for normality, reliability (Cronbach's Alpha = 0.846), regression, and correlation. The results of this study showed that the model was able to explain 50.2% of the variation in intentions ($R^2=0.502$), with perceived behavioral control having a significant effect (sig. 0.010), while the attitude was not partially significant. In conclusion, the intention of plastic reduction is more influenced by external factors in the form of infrastructure availability than mere awareness. The impact of the research confirms the importance of policies and provision of refillable drinking water facilities on campus to support the reduction of plastic waste.

Keywords: *Plastic Bottles, SDGs, SDGs Goal 14*

INTRODUCTION

The growing consumption of single-use plastic bottles has emerged as a critical environmental concern, particularly in urban settings and university environments in Indonesia. Previous research indicates that students tend to consume bottled drinking water due to its practicality, low cost, and easy access across campus areas (Aji, 2018; Lestari et al., 2019; Mulyani et al., 2021). Although students are generally aware of environmental issues, their daily

practices often do not reflect environmentally responsible behavior, highlighting a discrepancy between knowledge and actual actions (Nordin et al., 2020). In addition, limited access to alternative facilities, such as refillable water stations, remains a significant obstacle to reducing plastic consumption (Aji, 2018; Mulyani et al., 2021).

On a broader scale, the rapid increase in plastic production has resulted in severe environmental impacts, especially in marine ecosystems. Improperly managed plastic waste can enter water bodies and break down into microplastics, which threaten marine organisms and human health (Jambeck et al., 2015; Ryan, 2018). As an archipelagic nation, Indonesia is one of the major contributors to marine plastic pollution due to leakage from land-based waste systems (Li et al., 2016). This issue aligns closely with the Sustainable Development Goals (SDGs), particularly Goal 14, which focuses on reducing marine pollution.

From a theoretical perspective, the Theory of Planned Behavior (TPB) explains that intention is shaped by three key components: attitude, subjective norms, and perceived behavioral control (Ajzen, 1991). Previous studies have applied TPB in environmental contexts, showing that perceived behavioral control significantly affects individuals' intentions to reduce plastic use (Hasan et al., 2023). Moreover, access to alternatives has been identified as a crucial factor in encouraging environmentally friendly behavior (Heidbreder et al., 2019). However, other findings suggest that positive attitudes alone are insufficient to produce behavioral change without adequate external support (Chao, 2012; Nordin et al., 2020).

Despite extensive studies, there is still limited understanding of how internal factors (such as attitude) and external factors (such as perceived behavioral control) interact in influencing student behavior in developing countries, particularly Indonesia. Most studies emphasize awareness, while fewer explore the role of infrastructure availability. Therefore, this research aims to analyze the influence of attitude and perceived behavioral control on students' intentions to reduce single-use plastic bottle consumption, with relevance to achieving SDGs Goal 14. The findings are expected to contribute both theoretically and practically, especially in developing campus environmental policies.

LITERATURE REVIEW

Plastic waste is a problem for the environment. It doesn't break down easily. Hurts ecosystems. Over the few decades we've made a lot more plastic. This has led to an increase in plastic waste especially in our oceans. A lot of this waste isn't managed properly. It ends up in rivers and oceans. There it breaks down into pieces called microplastics. These microplastics are very bad for sea life and people's health. Indonesia is one of the countries made up of islands. It has a problem with plastic waste getting into the ocean. This makes Indonesia one of the contributors to ocean pollution. This issue is connected to the Sustainable Development Goals. Goal 14 Life Below Water is about reducing pollution in oceans from things people do on land. It wants us to reduce pollution from activities on land. Plastic waste is a contributor, to this problem we need to reduce waste to achieve this goal. The issue of waste and marine pollution is a significant concern.

Students are among the biggest consumers of single-use plastic bottles in the context of higher education. According to earlier research, students' inclination for bottled water is impacted by factors like accessibility, cost, and convenience (Aji, 2018; Mulyani et al., 2021). Students frequently continue to use single-use plastics despite having sufficient environmental knowledge because of habitual behavior and pragmatic factors (Lestari et al., 2019). This phenomena illustrates a disconnect between conduct and environmental awareness. According to research by Nordin et al. (2020), sustainable consumption patterns are not always correlated with environmental awareness and favorable sentiments. This disparity emphasizes the necessity to investigate other behavior-influencing elements, especially those pertaining to external circumstances.

The Theory of Planned Behavior (TPB) is widely used to explain pro-environmental behavior. According to TPB, behavioral intention is influenced by three main factors: attitude, subjective norms, and perceived behavioral control (Ajzen, as cited in Lestari et al., 2019). Attitude refers to an individual's evaluation of a behavior, while perceived behavioral control (PBC) reflects the perceived ease or difficulty of performing that behavior. Several studies have confirmed the relevance of TPB in explaining environmentally responsible behavior. Perceived behavioral control is often found to be a significant predictor of intention, especially when behavior depends on external resources or infrastructure (Hasan et al., 2023). When individuals perceive that they lack control—such as limited access to

refillable water facilities—their intention to engage in pro-environmental behavior decreases, even if their attitudes are positive (Ryan, 2018).

External factors, particularly infrastructure availability, play a crucial role in shaping pro-environmental behavior. The presence of refillable drinking water stations, for example, can significantly reduce reliance on single-use plastic bottles by increasing perceived behavioral control (Mulyani et al., 2021). Conversely, the absence of such facilities acts as a barrier to behavior change. In addition to infrastructure, social and cultural factors also influence consumption behavior. Social norms, peer influence, and lifestyle habits can reinforce the use of single-use plastics, even in environments where awareness is relatively high (Nordin et al., 2020). Therefore, effective interventions must integrate both behavioral and structural approaches.

Although previous studies have examined plastic consumption behavior and the application of TPB, there is still a need to better understand the relative influence of internal factors (such as attitudes) and external factors (such as perceived behavioral control) in specific contexts, particularly in Indonesian university environments. Many studies emphasize awareness, but fewer focus on how infrastructure and institutional support shape behavioral intentions. Therefore, this study seeks to fill this gap by analyzing the influence of attitude and perceived behavioral control on students' intentions to reduce the use of single-use plastic bottles, with a focus on identifying the dominant factors that can support more effective environmental interventions.

METHODOLOGY

This study employs a quantitative approach with a cross-sectional explanatory design to examine the influence of attitude and perceived behavioral control (PBC) on students' intention to reduce the use of single-use plastic bottles.

Population and sample

The population consists of university students from Universitas Komputer Indonesia. A total of 32 respondents were selected using a convenience sampling technique, considering accessibility and willingness to participate. The inclusion criteria were active students who regularly consume bottled drinking water on campus.

Data collection method

Data were collected through a structured questionnaire using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). The questionnaire was distributed online.

The measurement indicators were adapted from previous studies based on the Theory of Planned Behavior:

- 1) Attitude (X1): environmental awareness, perception of plastic impact
- 2) Perceived Behavioral Control (X2): ease of accessing refill facilities, perceived convenience
- 3) Behavioral Intention (Y): intention to reduce plastic bottle usage

Instrument testing

- 1) Validity test : pearson correlation
- 2) Reliability test : Cronbach's Alpha ($\alpha > 0.70$ considered reliable)

Data Analysis technique

Were data analyzed using SPSS software through :

- 1) Descriptive statistics
- 2) Normality test (Kolmogorov-Smirnov)
- 3) Classical assumption tests (multicollinearity and heteroscedasticity)
- 4) Multiple linear regression analysis to examine the effect of independent variables on behavioral intention
- 5) Correlation analysis

The significance level used in this study is $\alpha = 0.05$.

Research procedure

The research was conducted in several stages:

- 1) Literature review
- 2) Questionnaire design
- 3) Data collection
- 4) Data analysis
- 5) Interpretation of results

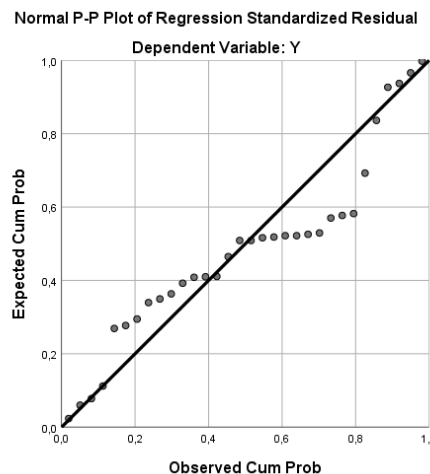
Ethical Consideration

All respondents participated voluntarily and anonymously. Informed consent was obtained prior to data collection, ensuring confidentiality and ethical compliance.

DISCUSSION

32 respondents made up the data sample for this investigation. The link between the variable attitudes toward behavior and the sense of behavioral control (against behavioral intents (X_1 X_2)Y) was examined through data processing utilizing statistical tools.

The distribution pattern can be considered normal if the histogram normality test yields a mountainous curve. The residual data are regularly distributed, according to the normality test results. The histogram's bell-shaped curve illustrates this, and the Kolmogorov-Smirnov test's significance value of 0.104 (> 0.05) supports it. As a result, the data satisfy the normalcy assumption.



Measurement consistency test Cronbach's Alpha value: 0.846 for 2 variable items. This value is greater than 0.60, so the research instrument is declared very reliable in measuring existing variables.

Reliability Statistics	
Alpha Cronbach	N item
.846	2

The reliability test findings indicate that the research instrument is dependable, with a Cronbach's Alpha value of 0.846, which is higher than 0.60. Additionally, the regression model's suitability is confirmed by the traditional assumption tests. The Kolmogorov-Smirnov significance value of 0.104 (> 0.05) and the histogram and Normal P-P Plot patterns both corroborate the residuals' normal distribution. Both multicollinearity (tolerance = 0.456 > 0.10 ; VIF = 2.192 < 10) and heteroscedasticity (Glejser test significance > 0.05) are absent. As a result, the model satisfies all requirements and is appropriate for additional research.

The model can account for 50.2% of the variance in behavioral intention, according to multiple regression analysis results ($R^2 = 0.502$). This suggests that attitude and perceived behavioral control together have a minor impact on students' intention to cut back on the usage of single-use plastic bottles, with additional factors not included in this study influencing the remaining 49.8%.

The independent factors have a significant impact on behavioral intention, according to the simultaneous test (F-test) ($\text{sig.} = 0.000 < 0.05$). Though attitude has a substantial positive correlation with intention ($r = 0.608$), the partial test (t-test) shows that perceived behavioral control has a significant effect on intention ($\text{sig.} = 0.010 < 0.05$), whereas attitude has no significant effect ($\text{sig.} = 0.285 > 0.05$).

These results show that the most important element affecting students' intention is perceived behavioral control. This indicates that when students believe they have enough control and access to resources like refillable drinking water stations, they are more likely to cut back on their use of single-use plastic bottles.

However, despite its great association, attitude's non-significant influence indicates a disconnect between environmental knowledge and real behavioral purpose. Even though students may already have favorable opinions on environmental preservation, these opinions are insufficient on their own to promote behavioral change in the absence of appropriate outside assistance. This condition implies that the conversion of good attitudes into genuine intentions is weakened by practical obstacles like inadequate infrastructure and convenience. This finding supports the Theory of Planned Behavior (TPB), which holds that behavior is heavily impacted by perceived behavioral control in addition to attitude. Perceived behavioral control is more important in this study, suggesting that pro-environmental intentions are shaped more by external variables than by internal opinions. This result is consistent with the Theory of Planned conduct (TPB), which maintains that conduct is significantly influenced by both attitude and perceived behavioral control. In this study, perceived behavioral control is more significant, indicating that pro-environmental intentions are influenced more by external factors than by internal beliefs.

These findings are consistent with previous studies. Research by Siswa & Novianti (2021) found that perceived behavioral control has a stronger influence than attitude in predicting environmentally friendly intentions. Similarly, Yuliawati et al. (2024) showed that external and social factors can dominate behavioral intention. However, this study differs in that attitude is not significant, indicating that contextual factors such as infrastructure availability on campus play a more crucial role.

plastic bags and straws in 150 respondents aged 16-25; attitudes and behavioral controls were significant (β attitude=0.21, β PBC=0.47), norms were not, with R^2 47.7%(Siswa & Novianti, 2021). Adaptation of the 2024 SDG scale for the reduction of single-use plastics in 295 NGO members; attitudes, PBC, and social pressure predict significant behavioral intentions (β social pressure = 0.48 highest)(Yuliawati et al., 2024).

Overall, the findings imply that raising environmental awareness should not be the only strategy used to cut down on the usage of single-use plastic bottles. Instead, more focus should be put on enhancing perceived behavioral control by offering suitable facilities and encouraging campus regulations, including easily accessible water refill stations. This strategy is more successful in promoting sustainable behavior and aiding in the accomplishment of SDG Goal 14.

CONCLUSION AND RECOMMENDATION

This study investigates the determinants of students' intentions to reduce the use of single-use plastic bottles by applying the Theory of Planned Behavior, with a focus on attitude and perceived behavioral control. The results demonstrate that perceived behavioral control has a more significant influence compared to attitude in shaping behavioral intention. This indicates that students are more inclined to engage in plastic reduction when they perceive sufficient support, accessibility, and convenience, rather than relying solely on environmental awareness. These findings confirm that external factors, particularly those related to access and infrastructure, play a more decisive role than internal attitudes. Consequently, improving behavioral intention requires not only educational or awareness-based strategies but also practical interventions that enable action. From a theoretical standpoint, this study reinforces the importance of perceived behavioral control within TPB, especially in contexts where behavior depends heavily on available resources. However, this research is limited by its small sample size and the inclusion of only two variables, which may not fully represent all factors affecting behavioral intention. Future studies are recommended to involve

larger samples and incorporate additional variables such as subjective norms, social influence, and policy factors. Practically, universities are encouraged to prioritize infrastructure-based solutions, such as providing refillable water stations, alongside supportive regulations to effectively reduce plastic usage. These efforts are essential in promoting sustainable behavior and contributing to the achievement of SDGs Goal 14.

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ABOUT THE AUTHORS

Assoc. Prof. Dr. Henny S.T., M.T email: Henny@email.unikom.ac.id

Maretno Marcelina Baru is an active student of Industrial Engineering who previously served as the general treasurer of the Industrial Engineering Student Association. He manages the organization's finances effectively and transparently. He has presented at two international seminars, ICOBEST and ISCEER, and led major programs including the Student Creativity Program (PKM), the Student Organization Development Program (PPK ORMAWA), and the Student Entrepreneurship Program (P2MW). She actively participates in academic and organizational activities while contributing to student development initiatives. Her experience reflects a strong commitment to self-development, leadership, professionalism, and dedication to fostering a productive and supportive campus environment for her peers.

Arcellia Citra Dewi Gumilar is an active student of Industrial Engineering at the Indonesian Computer University (UNIKOM). During his studies, he has been actively involved in various academic activities and student organizations that support the development of his professional competencies. Arcellia has published two international journal articles as a form of scientific contribution in the field of industrial engineering. She also participated in the Student Entrepreneurship Development Program (P2MW), which provides experience in developing business ideas and entrepreneurial skills. In addition, he has experience in scientific research and writing. This experience reflects his commitment to self-development, hard work, and positive contributions to creating a productive and innovative academic environment.