

Gamification and Incentive Mechanisms Driving Generation Z's Engagement in Return-and-Reuse Packaging: An Empirical Investigation within Vietnam's Circular Economy

Huynh Nguyen Tuyet Phuong

Faculty of Business Administration, Ho Chi Minh City University of Foreign Languages – Information Technology (HUFLIT), Vietnam

Received: 02.03.2026 | Accepted: 26.04.2026 | Published: 01.05.2026

*Corresponding Author: Huynh Nguyen Tuyet Phuong

DOI: [10.5281/zenodo.19925841](https://doi.org/10.5281/zenodo.19925841)

Abstract

Original Research Article

The escalating plastic waste crisis in Vietnam, where approximately 2.93 million tonnes of plastic waste are generated annually, underscores the urgent need for scalable circular economy interventions. Despite growing environmental awareness among Generation Z (Gen Z) consumers, participation in return-and-reuse packaging programs remains disproportionately low, revealing a persistent intention-behavior gap. This study investigates the psychological, motivational, and experiential determinants that drive Gen Z's engagement and subsequent intention to participate in circular economy practices, specifically within the domain of return-and-reuse packaging systems in Vietnam. Grounded in incentive theory (Killeen, 1982) and gamification theory (Deterding et al., 2011), this research develops and empirically tests a structural model incorporating five antecedent constructs: monetary incentives (MTI), environmental knowledge (ENK), enjoyment (EJM), points and badges (PBD), and non-monetary incentives (NMI), with engagement (EGM) serving as the mediating construct influencing intention toward circular economy participation (TCE). Primary data were collected through an online cross-sectional survey administered to 252 Gen Z consumers in Vietnam and subsequently analyzed using partial least squares structural equation modeling (PLS-SEM). The findings reveal that non-monetary incentives ($\beta = 0.502$, $p < 0.001$), enjoyment ($\beta = 0.227$, $p = 0.002$), and environmental knowledge ($\beta = 0.151$, $p = 0.023$) significantly and positively influence engagement. Engagement, in turn, demonstrates a strong predictive effect on circular economy intention ($\beta = 0.741$, $p < 0.001$). Notably, monetary incentives and gamification elements (points and badges) do not exert statistically significant effects on engagement, challenging conventional assumptions derived from incentive and gamification theories (Dang et al., 2023). These results contribute to the behavioral science literature by elucidating the primacy of intrinsic and value-driven motivators over extrinsic financial rewards in the context of sustainable consumption among young consumers. The study offers actionable implications for policymakers and practitioners seeking to design more effective circular packaging initiatives tailored to Gen Z's motivational profiles in emerging economies.

Keywords: Return-and-reuse packaging, circular economy, Generation Z, gamification, incentive theory, sustainable consumption, PLS-SEM, Vietnam.

Copyright © 2026 The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC 4.0).



1. Introduction

Plastic waste has emerged as one of the most pressing environmental sustainability challenges confronting the global community, driven by exponential growth in production, consumption, and the improper disposal of packaging materials (Geissdoerfer et al., 2017). Vietnam faces particularly acute challenges in this domain: the national plastics industry produced approximately 8.89 million tonnes in 2019, contributing around 6.7% of the country's gross domestic product (World Bank, 2021). Field surveys indicate that plastics constitute 94% of waste items and 71% by weight at riverbank and coastal sites across the country (World Bank, 2022). In 2021 alone, Vietnam generated over 8,000 tonnes of plastic waste per day, equivalent to roughly 2.93 million tonnes annually (Vietnam News, 2024). Concurrently, the concept of a circular economy—in which materials such as packaging are returned and reused instead of being discarded—is gaining traction as a viable strategy for promoting sustainable consumption (Dat et al., 2025; Le et al., 2025). Within this evolving landscape, Generation Z (born between 1997 and 2012) has become a prominent consumer cohort, distinguished by strong digital competencies, heightened social responsibility, and a greater predisposition toward sustainable behavior (Fromm & Read, 2018; Dang et al., 2025a). Therefore, examining how Gen Z engages with return-and-reuse packaging initiatives is both timely and of considerable practical significance.

Although previous research has examined sustainable consumption, plastic waste management, and circular economy initiatives (Ngo et al., 2024), several critical gaps persist, particularly in the context of Vietnam and Generation Z. Most studies treat consumers as a homogeneous population without differentiating behavioral patterns across generational cohorts, despite growing evidence that Gen Z is uniquely digitally literate, socially conscious, and environmentally aware (Fromm & Read, 2018; Dang et al., 2025a). Empirical investigations specifically addressing return-and-reuse packaging programs remain scarce, with the majority of the existing literature focusing on general

recycling or waste reduction behaviors (Geissdoerfer et al., 2017). Research conducted in developing economies such as Vietnam is limited, leaving unclear how cultural, economic, and institutional factors shape Gen Z's engagement in circular economy practices (Dat et al., 2025). Moreover, prior studies frequently highlight awareness or attitudes toward sustainability but fail to explore the psychological, motivational, and experiential factors that facilitate the translation of intention into actual participation (Wut et al., 2023; Dang et al., 2023). Few studies integrate both intrinsic and extrinsic motivational mechanisms alongside experiential dimensions, which are increasingly recognized as critical drivers of engagement in sustainable practices (Duong et al., 2023). These gaps underscore the imperative for rigorous empirical investigation into how motivational, knowledge-based, and experiential factors—framed by incentive and gamification theoretical perspectives—influence Gen Z's participation in return-and-reuse packaging initiatives within the Vietnamese context.

Despite the severity of plastic waste issues and the growing promotion of circular economy practices in Vietnam, actual consumer participation in return-and-reuse packaging programs remains relatively low, attributable to limited awareness of system operations, perceived inconvenience, and insufficient incentives to encourage behavioral change. While numerous awareness campaigns and organizational initiatives exist, awareness alone does not consistently translate into tangible behavioral outcomes (Ajzen, 2020). A central challenge lies in understanding what motivates Gen Z to transition from intention to action in the context of returning and reusing packaging. Incentive theory (Killeen, 1982) posits that participation can be influenced through external rewards and recognition—such as points, discounts, or social acknowledgment—which reinforce motivation and strengthen behavioral engagement. Meanwhile, gamification theory (Deterding et al., 2011) proposes that integrating game design elements such as badges, levels, challenges, and feedback loops can enhance engagement by making activities more enjoyable and providing a sense of accomplishment (Smiderle et al., 2020). Together, these theoretical frameworks

suggest that Gen Z's engagement may depend on both the intrinsic enjoyment and sense of accomplishment derived from gamified programs, as well as the extrinsic incentives that reinforce continued participation. Understanding these motivational drivers is crucial, as Gen Z is projected to become the dominant consumer demographic and could emerge as a key agent in advancing sustainable consumption and circular economy practices (Dang et al., 2025a; Nguyen et al., 2025).

This study aims to examine the determinants influencing Generation Z's participation in return-and-reuse packaging initiatives within the circular economy framework in Vietnam. The research focuses on motivational factors (enjoyment and engagement), knowledge-based factors (environmental knowledge), and incentive-related factors (monetary incentives, non-monetary incentives, and points and badges). Additionally, the study explores how environmental knowledge and non-monetary incentives—such as recognition and reward points—shape Gen Z's participation in these initiatives (Dang et al., 2023; Tran et al., 2025). The findings aim to improve the design, communication, and implementation of return-and-reuse packaging systems, thereby enhancing Gen Z participation and supporting the broader adoption of circular economy practices in Vietnam.

The remainder of this paper is structured as follows. Section 2 reviews the relevant theoretical frameworks, including incentive theory and gamification theory, and develops the research hypotheses. Section 3 explains the research methodology, including the research model, data collection, sampling, and analytical techniques. Section 4 presents the data analysis and results. Section 5 provides the discussion, implications, conclusions, and future research directions.

2. Literature Review and Hypotheses Development

2.1. Theoretical Foundations

2.1.1. Gamification Theory

Gamification is broadly defined as “the use of game design elements in non-game contexts” to

increase enjoyment, motivation, and engagement associated with goods, services, or applications (Deterding et al., 2011). Within the sustainability domain, gamification represents a viable strategy for encouraging participation in circular economy practices and influencing sustainable consumption patterns. By incorporating elements such as points, badges, and enjoyment-driven features into non-gaming environments, gamification transforms routine tasks into more engaging and motivating experiences (Dang et al., 2023). These game-based techniques increase user engagement with sustainable behaviors by capturing attention, sustaining interaction, and creating a sense of accomplishment.

In recent years, gamification has been rapidly adopted across diverse sectors, including health (Hamari & Koivisto, 2015; Jones et al., 2014), environment (Prestopnik & Tang, 2015), education (Domínguez et al., 2013; Binh et al., 2024), marketing and advertising (Terlutter & Capella, 2013), and crowdsourcing (Garrigos-Simon et al., 2015; Rapp, 2020). When applied to the circular economy, gamification serves as a mechanism that enhances the user experience and strengthens the link between engagement and the intention to adopt sustainable habits. Gamified recycling systems and reward-based environmental applications have been found to boost user participation in waste reduction and product reuse (Mabalay, 2025). However, the theory faces several limitations. Extrinsic rewards may not sustain motivation in the long run, and gamification impacts are frequently short-lived and context-dependent (Koivisto & Hamari, 2019; García-Jurado et al., 2021; Seaborn & Fels, 2015).

2.1.2. Incentive Theory

In behavioral psychology, Killeen (1982) developed incentive theory to explain how external rewards influence human behavior. The theory posits that incentives—functioning as reinforcers—increase the probability of repeating a behavior when it results in an appealing outcome. The framework proposes that motivation is predicted by external inputs such as accessible incentives and environmental signals, which subsequently explain

behavioral intention and sustained engagement. Incentive theory offers both mathematical and experimental frameworks for capturing these motivational processes, making it applicable to sophisticated human behaviors as well as simpler behavioral tasks (Killeen et al., 1978; Dang et al., 2023).

Incentive theory has been scientifically validated and applied across diverse behavioral domains. Deci et al. (1999) found that incentives such as grades and recognition significantly impacted students' motivation and involvement. In public health, Volpp et al. (2008) demonstrated the theory's practical application through financial incentive-based weight loss programs. Wang et al. (2021) applied the theory to investigate how economic incentives affect citizens' recycling intentions in China, distinguishing between monetary incentives (direct financial rewards) and non-monetary incentives (symbolic or reputational advantages). Their findings revealed that both types of incentives considerably increased recycling intentions, although monetary incentives exhibited a stronger effect. Despite its contributions, incentive theory has notable limitations, including its emphasis on behavioral vigor while neglecting direction, and questions regarding its applicability to complex, real-world human behaviors developed primarily under controlled laboratory conditions (Bindra, 1974; Tran et al., 2025).

2.2. Hypotheses Development

2.2.1. Monetary Incentives and Engagement

Monetary incentives (MTI) are defined as financial rewards or tangible economic benefits—such as cash, discounts, gift certificates, reward points, or cashback—designed to encourage individuals to perform desired behaviors (Figueiredo et al., 2025). In the sustainability domain, financial rewards are frequently deployed to promote environmentally friendly behaviors including recycling, packaging returns, and green consumption (Abila & Kantola, 2019). Previous studies have suggested that when consumers perceive a clear financial benefit, they tend to increase their participation in environmentally friendly behaviors

(Dang et al., 2023). Specifically, when financial rewards are integrated with gamification mechanisms—such as points, badges, and redemption systems—MTI not only motivates but also increases interactivity and enhances long-term engagement in recycling programs (Cheng et al., 2021; Huang, 2023). Therefore:

H1: Monetary incentives positively influence Gen Z's engagement in return-and-reuse packaging.

2.2.2. Environmental Knowledge and Engagement

Environmental knowledge (ENK) refers to an individual's understanding of environment-related behaviors based on environmental information (Laroche et al., 2001). Taufique et al. (2016) and Zsóka et al. (2013) further conceptualize ENK as the level of understanding and awareness of environmental problems and their possible solutions. Law et al. (2017) demonstrated that ENK has the capacity to promote positive attitudes toward ecological issues and influence green consumption behaviors. In the context of return-and-reuse packaging, when consumers—especially Gen Z—are not sufficiently equipped with knowledge about the process and benefits, achieving meaningful engagement becomes considerably more challenging (Capeau et al., 2024; Dang et al., 2025b). Knowledge contributes to behavior formation (Ratchford, 2001), and the learning process drives engagement (Behnam et al., 2021). Therefore:

H2: Environmental knowledge positively influences Gen Z's engagement in return-and-reuse packaging.

2.2.3. Enjoyment and Engagement

Enjoyment (EJM) is considered an intrinsic motivation, whereby an individual performs an activity because the process itself brings pleasure and satisfaction, independent of external purposes or influences (Teo & Noyes, 2011). EJM has been identified as a strong predictor of consumers' emotional responses, particularly in digital environments, and numerous studies have integrated this variable into behavioral modeling to

demonstrate its positive impact on participation intention (Chang & Chen, 2021; Dang et al., 2023). Previous studies have shown that EJM has a strong association with engagement (Akdim et al., 2022), and Pansari and Kumar (2017) emphasize that positive emotional experiences condition customer engagement. When Gen Z perceives that return-and-reuse activities provide a positive and enjoyable experience, they tend to participate regularly and maintain sustainable behaviors long-term (Lopes et al., 2024). Therefore:

H3: Enjoyment positively influences Gen Z's engagement in return-and-reuse packaging.

2.2.4. Points and Badges and Engagement

Points and badges (PBD) represent central gamification elements that enhance users' motivation and engagement in non-game contexts (Deterding et al., 2011; Smiderle et al., 2020). According to Sun and Xing (2023), these rewards create psycho-social values, and the motivation derived from pleasure and achievement positively affects consumer behavior. Meng et al. (2024) indicate that points demonstrate significant impact on multiple engagement aspects, while badges specifically relate to participatory engagement. The provision of instant PBD increases consumer receptivity, initiative, and commitment (Lu & Ho, 2020). Furthermore, PBD can increase green consumption behavior (Liu et al., 2024), thereby emphasizing PBD's potential effectiveness in promoting engagement with environmentally sustainable practices (Dang et al., 2025b; Vo et al., 2024). Therefore:

H4: Points and badges positively influence Gen Z's engagement in return-and-reuse packaging.

2.2.5. Non-Monetary Incentives and Engagement

Non-monetary incentives (NMI) refer to non-cash benefits provided to retain and motivate individuals in recognition of their performance (Woodruffe, 2006). According to incentive theory, human behavior is driven by both exogenous and endogenous reward factors, and according to

gamification theory, NMI affects intrinsic motivation and perception (Li et al., 2024), thereby facilitating behavioral development. Aguinis et al. (2013) argue that non-financial rewards are considered more valuable than financial rewards because they express respect and recognition of personal achievements. Previous studies have demonstrated that NMI—such as recognition and opportunities for personal growth—are more effective than MTI in promoting intention and maintaining long-term behavior (Francies et al., 2025; Dang et al., 2023). Ji et al. (2023) demonstrate the use of environmental theme badges as NMI for recycling behavior. This suggests that, in the circular economy context, NMI serves as an important encouragement mechanism for Gen Z to participate more actively (Theocharis & Tsekouropoulos, 2025; Tien et al., 2023). Therefore:

H5: Non-monetary incentives positively influence Gen Z's engagement in return-and-reuse packaging.

2.2.6. Engagement and Intention to Circular Economy

Engagement (EGM) describes a psychological state related to cognitive, emotional, and behavioral participation toward initiatives from the environment (Hollebeek et al., 2011; Alam et al., 2023). Intention, in turn, is expressed as the level of motivation that prompts an individual to perform an action, reflecting the committed effort they are expected to invest (Ajzen, 1991). Previous studies have established that the level of commitment and engagement with environmental activity increases eco-friendly behaviors and determinants in sustainable consumption behavior (Čapienė et al., 2021; Dang et al., 2023). Hollebeek et al. (2014) demonstrate that EGM influences continued use behavior. This suggests that engagement plays a critical mediating role in translating motivational antecedents into intention for circular economy participation (TCE), such as packaging returns and reuse (Nguyen et al., 2025; Dang & Duc, 2025). Therefore:

H6: Engagement positively influences Gen Z's intention to participate in the circular economy through return-and-reuse packaging.

3. Methodology

3.1. Research Design

This study adopted a quantitative and explanatory research design using a cross-sectional survey to explore the factors influencing Gen Z's return-and-reuse packaging behavior in Vietnam within the circular economy context. The research design was developed with the objective of ensuring coherence between the sample characteristics and methodological consistency across contexts to deliver actionable results (Parry et al., 2021; Dang et al., 2023). Primary data were collected through an online questionnaire measuring behavioral performance constructs among Gen Z consumers in Vietnam. Survey participants responded to standardized measurement items for each construct. Quantitative analysis was applied to examine the relationships between variables, providing objective evidence and empirical data to support conclusions based on the theoretical framework (Gao & Shen, 2024; Tran et al., 2025).

3.2. Questionnaire Design and Measurement

The survey instrument was designed in two main parts: demographic characteristics (limited to Gen Z respondents) and measurement items assessing awareness, motivation, engagement, and intention related to return-and-reuse packaging implementation. The measurement constructs include monetary incentives (MTI), environmental knowledge (ENK), enjoyment (EJM), points and badges (PBD), non-monetary incentives (NMI), engagement (EGM), and intention to circular economy (TCE). All constructs were measured using a 7-point Likert scale ranging from (1) "Strongly Disagree" to (7) "Strongly Agree." The measurement items were adapted from previously validated scales

in the extant literature (Dang et al., 2023; Dang et al., 2025b). A complete list of measurement items and their sources is presented in Appendix A.

3.3. Sample Size and Sampling Strategy

The sample size was determined using G*Power 3 software. For the univariate linear regression model with 6 predictor variables, effect size ($f^2 = 0.15$), significance level ($\alpha = 0.05$), and statistical power ($1 - \beta = 0.80$), the minimum required sample size was 98 participants. Additionally, the "10-times rule" (Hair et al., 2017) was applied to the PLS-SEM model, establishing a minimum sample size of 60. Hair et al. (2011) and Kock and Hadaya (2018) recommend employing larger sample sizes to improve model stability and reduce sampling error. A total of 252 valid responses were obtained, substantially exceeding both minimum thresholds and ensuring adequate statistical power for PLS-SEM analysis (Tran et al., 2025; Dang et al., 2023).

4. Data Analysis and Results

4.1. Respondent Profile

Table 1 summarizes the demographic characteristics of the study's respondents. The sample was predominantly female (55.6%), with males comprising 44.4%. The majority of respondents (55.2%) were aged 18–21, followed by those aged 22–25 (37.3%) and a smaller proportion aged 26–28 (7.5%). Regarding monthly income, nearly half (48.8%) earned less than 5 million VND. In terms of educational attainment, the majority (84.9%) held university or college degrees. Concerning packaging return-and-reuse frequency, respondents demonstrated varying levels of engagement: 26.2% participated occasionally (4–5 times/month), 23.0% frequently (6–8 times/month), and 19.4% rarely (2–3 times/month).

Table 1. Demographic profile of respondents.

| Characteristic | Category | Freq. | % |
|----------------|--------------------|-------|------|
| Gender | Female | 142 | 55.6 |
| | Male | 110 | 44.4 |
| Age | 18–21 | 139 | 55.2 |
| | 22–25 | 94 | 37.3 |
| | 26–28 | 19 | 7.5 |
| Income | < 5,000,000 VND | 123 | 48.8 |
| | 5–10 million VND | 70 | 27.8 |
| | 10–20 million VND | 44 | 17.5 |
| | > 20,000,000 VND | 15 | 6.0 |
| Education | University/College | 214 | 84.9 |
| | Master’s degree | 26 | 10.3 |
| | Doctoral degree | 6 | 2.4 |
| | Other | 6 | 2.4 |

Source: Authors’ survey data (n = 252).

4.2. Assessment of the Outer Measurement Model

The PLS-SEM algorithm was employed to estimate outer loadings, composite reliability (rho_a and rho_c), and average variance extracted (AVE). As presented in Table 2, all factor loadings exceeded the recommended threshold of 0.70, with the exception of items EJM5, ENK4, and ENK6, which were subsequently removed from the analysis. The rho_a index ranged from 0.771 to 0.868, and the

rho_c index ranged from 0.849 to 0.898, all exceeding the minimum threshold of 0.70, thereby confirming high reliability and good internal consistency (Cheung et al., 2024; Dang et al., 2023). The AVE values ranged from 0.527 to 0.685, surpassing the minimum requirement of 0.50, indicating that each construct explains the majority of variance in its observed variables and confirming convergent validity (Fornell & Larcker, 1981; Tran et al., 2025).

Table 2. Loadings, composite reliability, and average variance extracted.

| Construct | Items | Loadings | pA | CR | AVE |
|-----------|-------|----------|-------|-------|-------|
| MTI | MTI1 | 0.793 | 0.771 | 0.849 | 0.586 |
| | MTI2 | 0.802 | | | |
| | MTI3 | 0.715 | | | |
| | MTI4 | 0.749 | | | |
| ENK | ENK1 | 0.773 | 0.830 | 0.870 | 0.527 |
| | ENK2 | 0.755 | | | |
| | ENK3 | 0.722 | | | |
| | ENK5 | 0.758 | | | |
| EJM | EJM1 | 0.831 | 0.868 | 0.898 | 0.640 |
| | EJM2 | 0.821 | | | |

| | | | | | |
|-----|------|-------|-------|-------|-------|
| | EJM3 | 0.863 | | | |
| | EJM4 | 0.792 | | | |
| PBD | PBD1 | 0.832 | 0.859 | 0.897 | 0.685 |
| | PBD2 | 0.845 | | | |
| | PBD3 | 0.828 | | | |
| | PBD4 | 0.806 | | | |
| NMI | NMI1 | 0.771 | 0.859 | 0.898 | 0.638 |
| | NMI2 | 0.825 | | | |
| | NMI3 | 0.784 | | | |
| | NMI4 | 0.778 | | | |
| | NMI5 | 0.832 | | | |
| EGM | EGM1 | 0.836 | 0.850 | 0.890 | 0.619 |
| | EGM2 | 0.829 | | | |
| | EGM3 | 0.775 | | | |
| | EGM4 | 0.799 | | | |
| TCE | TCE1 | 0.807 | 0.863 | 0.899 | 0.641 |
| | TCE2 | 0.800 | | | |
| | TCE3 | 0.819 | | | |
| | TCE4 | 0.829 | | | |
| | TCE5 | 0.744 | | | |

Source: PLS-SEM output.

4.3. Assessment of the Inner Structural Model

To test the significance of the path coefficients, t-values were obtained using a bootstrapping procedure with 252 resamples. As presented in Table 3, four of six hypotheses were supported. The relationships between MTI and EGM (H1: $\beta = -0.048$, $p = 0.403$) and PBD and EGM (H4: $\beta = 0.109$, $p = 0.060$) were not statistically significant at the 0.05 level. The unsupported hypotheses were further validated using bias-corrected confidence

intervals at the 2.5% and 97.5% levels. Notably, the confidence interval for H1 (2.5% = -0.159 ; 97.5% = 0.068) straddles zero, confirming the non-significant association. Non-monetary incentives emerged as the strongest predictor of engagement ($\beta = 0.502$, $p < 0.001$), followed by enjoyment ($\beta = 0.227$, $p = 0.002$), and environmental knowledge ($\beta = 0.151$, $p = 0.023$). Engagement demonstrated a strong and highly significant predictive effect on circular economy intention ($\beta = 0.741$, $p < 0.001$).

Table 3. Structural model examination results.

| H | Path | β | T-stat | p | 2.5% | 97.5% | Result |
|----|---------|---------|--------|-------|--------|-------|-----------------|
| H1 | MTI→EGM | -0.048 | 0.837 | 0.403 | -0.159 | 0.068 | Rejected |
| H2 | ENK→EGM | 0.151 | 2.268 | 0.023 | 0.025 | 0.287 | Supported |
| H3 | EJM→EGM | 0.227 | 3.119 | 0.002 | 0.082 | 0.367 | Supported |
| H4 | PBD→EGM | 0.109 | 1.884 | 0.060 | 0.002 | 0.231 | Rejected |

| | | | | | | | |
|----|---------|-------|--------|--------|-------|-------|-----------|
| H5 | NMI→EGM | 0.502 | 5.299 | <0.001 | 0.304 | 0.674 | Supported |
| H6 | EGM→TCE | 0.741 | 22.636 | <0.001 | 0.678 | 0.806 | Supported |

Notes: Significance at $p < 0.05$. Bootstrap $n = 252$.

5. Discussion

This study examined the factors influencing Gen Z’s engagement and intention to adopt circular economy practices through return-and-reuse packaging in Vietnam. Drawing upon incentive theory (Killeen, 1982) and gamification theory (Deterding et al., 2011), the investigation yielded several theoretically and practically significant findings that both corroborate and extend the existing body of knowledge.

Contrary to the conventional predictions of incentive theory, the relationship between monetary incentives and engagement was not statistically significant (H1: $\beta = -0.048$, $p = 0.403$). This finding suggests that financial rewards—such as discounts, rebates, or cashback offers—may be insufficient for fostering sustained engagement in circular economy activities among Gen Z consumers. This result challenges the traditional assumption that financial incentives constitute universally effective behavioral drivers (Graf et al., 2023; Takahashi et al., 2016). One plausible explanation is that Gen Z consumers, who tend to prioritize authenticity, social responsibility, and purpose-driven consumption, may perceive monetary incentives as extrinsically imposed rather than personally meaningful (Dang et al., 2025a; Theocharis & Tsekouropoulos, 2025). This interpretation aligns with self-determination theory (Ryan & Deci, 1985), which posits that extrinsic rewards can undermine intrinsic motivation under certain conditions.

Environmental knowledge demonstrated a positive and statistically significant effect on engagement (H2: $\beta = 0.151$, $p = 0.023$), indicating that individuals who possess greater awareness of environmental issues are more likely to participate in circular economy initiatives. This finding is consistent with prior research establishing the role of environmental cognition in shaping pro-

environmental behavior (Cui et al., 2024; Dang et al., 2023). The implication is that increasing public understanding of circular practices can directly boost engagement by instilling a sense of personal responsibility and efficacy in environmental decision-making.

Enjoyment emerged as a significant and positive predictor of engagement (H3: $\beta = 0.227$, $p = 0.002$), suggesting that individuals who derive pleasure, satisfaction, or emotional gratification from sustainability-related activities are more likely to sustain participation over time. This finding resonates with the hedonic motivation literature and is consistent with the experiential value perspective adopted in mobile payment and digital service adoption research (Dang et al., 2023; Dang et al., 2025b). Within the circular economy context, enjoyment may stem from a sense of personal contribution to environmental protection, suggesting that emotional and sensory fulfillment can be more effective than extrinsic rewards in promoting long-term behavioral engagement.

Similar to monetary incentives, points and badges—representing core gamification elements—did not demonstrate a significant impact on engagement (H4: $\beta = 0.109$, $p = 0.060$). This finding contradicts prior research in gamified learning and e-commerce contexts suggesting that gamification consistently enhances motivation and involvement (García-Jurado et al., 2021; Hamari et al., 2014). However, in the specific context of circular economy participation, respondents may not perceive digital rewards as meaningful or legitimate motivators. Gamification elements such as badges or points might improve short-term interaction, but if they lack emotional significance or alignment with personal values, their motivational impact diminishes rapidly (Koivisto & Hamari, 2019; Seaborn & Fels, 2015; Dang et al., 2025b). This finding extends

gamification theory by demonstrating that not all gamification components are equally effective across contexts, particularly in sustainability-oriented programs where users expect tangible value and perceived authenticity.

Non-monetary incentives emerged as the most influential predictor of engagement ($\beta = 0.502$, $p < 0.001$), representing the strongest effect in the structural model. These incentives—including recognition, social praise, symbolic rewards, and opportunities for self-expression—appeal to both intrinsic and social motivational dimensions. This finding strongly supports the argument that, in the context of sustainability-related activities, individuals place greater value on recognition and purpose than on financial gain (Dang et al., 2023; Nguyen et al., 2025). Organizations promoting circular economy practices should prioritize social recognition and community engagement mechanisms to foster deeper and more sustained participation.

The strong and highly significant relationship between engagement and circular economy intention (H6: $\beta = 0.741$, $p < 0.001$) underscores engagement's critical role as a psychological bridge that converts motivation and knowledge into behavioral intention. These findings are consistent with earlier research emphasizing the centrality of psychological involvement in translating desire into sustained behavioral intention (Hollebeek et al., 2014; Dang et al., 2023; Dang & Duc, 2025). Collectively, the results indicate that individuals' commitment to sustainability is predominantly influenced by intrinsic and value-driven motives rather than pecuniary or superficial rewards, providing important insights into the psychological mechanisms underpinning engagement in circular economy practices.

6. Implications, Conclusion, and Future Research Directions

6.1. Theoretical Contributions

This study makes several significant theoretical contributions to the intersection of incentive theory and gamification theory within the

context of sustainable consumer behavior. First, the non-significant effects of monetary incentives and points-and-badges on engagement challenge the traditional assumptions of both theories, which posit that financial rewards and gamification elements are universally effective behavioral drivers (Dang et al., 2023; Tran et al., 2025). The finding that monetary incentives do not significantly influence Gen Z's engagement suggests that financial rewards may no longer serve as central motivational drivers for this cohort in social and environmental contexts, where intrinsic values and environmental goals may assume greater importance. Similarly, the non-significant effect of points and badges indicates that not all gamification elements are equally effective (Meng et al., 2024), expanding and clarifying gamification theory by demonstrating that PBD does not invariably generate engagement, particularly in sustainability programs where users expect authentic value and perceived transparency (Dang et al., 2025b; Vo et al., 2024). These findings contribute to the academic discourse by highlighting fundamental shifts in Gen Z's behavioral dynamics and opening new research directions regarding moderating and mediating variables in sustainable behavior models.

6.2. Managerial Implications

The findings carry several important managerial implications for businesses and policymakers implementing return-and-reuse packaging programs in the circular economy context. First, given that environmental knowledge, enjoyment, and non-monetary incentives significantly influence engagement (Cui et al., 2024; Sun & Xing, 2023; Dang et al., 2023), organizations should invest in educational campaigns, user experience enhancement, and non-financial recognition mechanisms. Second, as monetary incentives and gamification elements did not demonstrate significant effects on engagement (Xu et al., 2023), businesses should reconsider the over-reliance on financial rewards and instead redesign value propositions that align with Gen Z's intrinsic motivational profiles. Third, since engagement is identified as the central mediating factor determining circular economy intention (Ahmed et al., 2022; Karjaluoto & Shaikh, 2016; Dang et al., 2025a),

organizations should optimize user experiences through process simplification, transparency enhancement, and technology integration to maintain sustained participation.

6.3. Conclusion

This study investigated the psychological and motivational determinants influencing Gen Z consumers' engagement and intention to adopt circular economy practices in Vietnam, employing incentive theory (Killeen, 1982) and gamification theory (Deterding et al., 2011) as foundational theoretical frameworks. The findings demonstrate that environmental knowledge, enjoyment, and non-monetary incentives significantly predict engagement, which in turn strongly predicts circular economy participation intention. Conversely, monetary incentives and gamification elements (points and badges) did not exert significant effects on engagement, suggesting that for Vietnamese Gen Z—who are digitally savvy and socially conscious—monetary or game-based incentives are insufficient to sustain long-term environmental commitment (Dang et al., 2023; Nguyen et al., 2025). This study contributes both theoretically and practically to understanding the nexus between psychological engagement and circular economy intention among young consumers, emphasizing the importance of creating emotional connection, environmental education, and social recognition as sustainable drivers of pro-environmental engagement in Vietnam's emerging green economy.

References

Abila, B., & Kantola, J. (2019). The perceived role of financial incentives in promoting waste recycling—Empirical evidence from Finland. *Recycling*, 4(1). <https://doi.org/10.3390/recycling4010004>

Aguinis, H., Joo, H., & Gottfredson, R. K. (2013). What monetary rewards can and cannot do: How to show employees the money. *Business Horizons*, 56(2), 241–249. <https://doi.org/10.1016/j.bushor.2012.11.007>

Ahmed, B., Zada, S., Zhang, L., Sidiki, S. N., Contreras-Barraza, N., Vega-Muñoz, A., & Salazar-Sepúlveda, G. (2022). The impact of customer experience and customer engagement on behavioral intentions: Does competitive choices matters? *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.864841>

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211.

Ajzen, I. (2020). The theory of planned behavior: Frequently asked questions. *Human Behavior and Emerging Technologies*, 2(4), 314–324. <https://doi.org/10.1002/hbe2.195>

Akdim, K., Casaló, L. V., & Flavián, C. (2022). The role of utilitarian and hedonic aspects in the continuance intention to use social mobile apps. *Journal of Retailing and Consumer Services*, 66, 102888. <https://doi.org/10.1016/j.jretconser.2021.102888>

Alam, M. M., Lutfi, A., & Alsaad, A. (2023). Antecedents and consequences of customers' engagement with pro-environmental consumption-related content on social media. *Sustainability*, 15(5). <https://doi.org/10.3390/su15053974>

Behnam, M., Hollebeek, L. D., Clark, M. K., & Farabi, R. (2021). Exploring customer engagement in the product vs. service context. *Journal of Retailing and Consumer Services*, 60, 102456. <https://doi.org/10.1016/j.jretconser.2021.102456>

Bindra, D. (1974). A motivational view of learning, performance, and behavior modification. *Psychological Review*, 81(3), 199–213. <https://doi.org/10.1037/h0036330>

Binh, N. T. H., Dang, T.-Q., & Nguyen, L.-T. (2024). Metaverse: The future for immersive logistics and international business education. *Journal of Teaching in International Business*, 35(3–4), 75–107. <https://doi.org/10.1080/08975930.2024.2445861>

Čapienė, A., Rūtelionė, A., & Tvaronavičienė, M. (2021). Pro-environmental and pro-social engagement in sustainable consumption:

- Exploratory study. *Sustainability*, 13(4), 1–20. <https://doi.org/10.3390/su13041601>
- Capeau, F., Valette-Florence, P., & Cova, V. (2024). A consumer demands-resources model of engagement. *Journal of Business Research*, 177. <https://doi.org/10.1016/j.jbusres.2024.114619>
- Chang, Y. W., & Chen, J. (2021). What motivates customers to shop in smart shops? *Journal of Retailing and Consumer Services*, 58, 102325. <https://doi.org/10.1016/j.jretconser.2020.102325>
- Cheng, K. M., Koo, A. C., Mohd Nasir, J. S., & Wong, S. Y. (2021). Playing Edcraft at Home: Gamified online learning for recycling intention during lockdown. *F1000Research*, 10, 890. <https://doi.org/10.12688/f1000research.72761.1>
- Cheung, G. W., Cooper-Thomas, H. D., Lau, R. S., & Wang, L. C. (2024). Reporting reliability, convergent and discriminant validity with structural equation modeling. *Asia Pacific Journal of Management*, 41(2), 745–783. <https://doi.org/10.1007/s10490-023-09871-y>
- Cui, M., Li, Y., & Wang, S. (2024). Environmental knowledge and green purchase intention and behavior in China. *Sustainability*, 16(14). <https://doi.org/10.3390/su16146263>
- Dang, T.-Q., & Duc, D. T. V. (2025). Examining the impact of trust on customer intention to use metaverse payments. *Corporate and Business Strategy Review*, 6(1), 166–177. <https://doi.org/10.22495/cbsrv6i1art16>
- Dang, T.-Q., Mai, V.-T. L., Duc, D. T. V., Huynh, T. B., & Nguyen, N. T. T. (2026). A mixed methods analysis of palm payment adoption based on UTAUT2 and perceived trust. *Discover Psychology*. <https://doi.org/10.1007/s44202-025-00548-9>
- Dang, T.-Q., Nguyen, T.-M., Tran, P.-T., Phan, T.-T. C., Huynh, T.-B., & Nguyen, L.-T. (2025a). From reality to virtuality: Unveiling Gen Z’s purchasing behavior through virtual influencers in the metaverse. *Digital Business*, 5(2), 100141. <https://doi.org/10.1016/j.digbus.2025.100141>
- Dang, T.-Q., Tan, G. W.-H., Aw, E. C.-X., Ooi, K.-B., Metri, B., & Dwivedi, Y. K. (2023). How to generate loyalty in mobile payment services? An integrative dual SEM-ANN analysis. *International Journal of Bank Marketing*, 41(6), 1177–1206. <https://doi.org/10.1108/IJBM-05-2022-0202>
- Dang, T.-Q., Duc, D. T. V., Tran, L. H. P., & Nguyen, L. T. (2025b). Examining the impact of trust on customer intention to use metaverse payments: A next-gen transactions strategic outlook. *Corporate and Business Strategy Review*, 6(1), 166–177. <https://doi.org/10.22495/cbsrv6i1art16>
- Dat, P. T., Hang, N. P. T., & Hang, T. T. (2025). Factors affecting the circular economy in Vietnam. *Contemporary Economics*, 19(2), 132–147. <https://doi.org/10.5709/ce.1897-9254.558>
- Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin*, 125(6), 627–668. <https://doi.org/10.1037/0033-2909.125.6.627>
- Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining “gamification.” *Proceedings of the 15th International Academic MindTrek Conference*, 9–15. <https://doi.org/10.1145/2181037.2181040>
- Domínguez, A., Saenz-de-Navarrete, J., De-Marcos, L., Fernández-Sanz, L., Pagés, C., & Martínez-Herráiz, J.-J. (2013). Gamifying learning experiences: Practical implications and outcomes. *Computers & Education*, 63, 380–392. <https://doi.org/10.1016/j.compedu.2012.12.020>
- Duong, C. D., Nguyen, T. H., & Nguyen, H. L. (2023). How green intrinsic and extrinsic motivations interact to trigger green purchase intention and behavior. *Heliyon*, 9(10). <https://doi.org/10.1016/j.heliyon.2023.e20886>
- Figueiredo, E., Margaça, C., García, J. C. S., & Ribeiro, C. (2025). The contribution of reward systems in the work context: A systematic review. *Journal of the Knowledge Economy*. <https://doi.org/10.1007/s13132-024-02492-w>
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50.

- Francies, S., Arumugam, T., & Basri, M. (2025). Analyzing the influence of monetary and non-monetary rewards on employees' engagement. *International Journal of Emerging Issues in Management, Accounting and Technology*, 1(1).
- Fromm, J., & Read, A. (2018). Marketing to Gen Z: The rules for reaching this vast and very different generation of influencers. AMACOM.
- Gao, F., & Shen, Z. (2024). Sensory brand experience and brand loyalty: Mediators and gender differences. *Acta Psychologica*, 244, 104191. <https://doi.org/10.1016/j.actpsy.2024.104191>
- García-Jurado, A., Torres-Jiménez, M., Leal-Rodríguez, A. L., & Castro-González, P. (2021). Does gamification engage users in online shopping? *Electronic Commerce Research and Applications*, 48. <https://doi.org/10.1016/j.elerap.2021.101076>
- Garrigos-Simon, F. J., Gil-Pechuán, I., & Estelles-Miguel, S. (2015). *Advances in crowdsourcing*. Springer. <https://doi.org/10.1007/978-3-319-18341-1>
- Geissdoerfer, M., Savaget, P., Bocken, N. M. P., & Hultink, E. J. (2017). The circular economy—A new sustainability paradigm? *Journal of Cleaner Production*, 143, 757–768. <https://doi.org/10.1016/j.jclepro.2016.12.048>
- Graf, C., Suanet, B., Wiepking, P., & Merz, E. M. (2023). Social norms offer explanation for inconsistent effects of incentives on prosocial behavior. *Journal of Economic Behavior and Organization*, 211, 429–441. <https://doi.org/10.1016/j.jebo.2023.05.003>
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice*, 19(2), 139–152. <https://doi.org/10.2753/MTP1069-6679190202>
- Hair, J., Hollingsworth, C. L., Randolph, A. B., & Chong, A. Y. L. (2017). An updated and expanded assessment of PLS-SEM in information systems research. *Industrial Management and Data Systems*, 117(3), 442–458. <https://doi.org/10.1108/IMDS-04-2016-0130>
- Hamari, J., & Koivisto, J. (2015). “Working out for likes”: An empirical study on social influence in exercise gamification. *Computers in Human Behavior*, 50, 333–347. <https://doi.org/10.1016/j.chb.2015.04.018>
- Hamari, J., Koivisto, J., & Sarsa, H. (2014). Does gamification work? A literature review of empirical studies on gamification. *Proceedings of the 47th Hawaii International Conference on System Sciences*, 3025–3034. <https://doi.org/10.1109/HICSS.2014.377>
- Hollebeek, L. D., Glynn, M. S., & Brodie, R. J. (2014). Consumer brand engagement in social media: Conceptualization, scale development and validation. *Journal of Interactive Marketing*, 28(2), 149–165. <https://doi.org/10.1016/j.intmar.2013.12.002>
- Hollebeek, L. D., Juric, B., & Ilic, A. (2011). Customer engagement: Conceptual domain, fundamental propositions, and implications for research. *Journal of Service Research*, 14(3), 252–271.
- Huang, L. C. (2023). The effect of incentives on facilitating user engagement with succulent retailers' social media pages. *Horticulturae*, 9(8). <https://doi.org/10.3390/horticulturae9080849>
- Ji, Z., Gong, Y., Li, Y., & Sun, Y. (2023). Effects of monetary and nonmonetary incentives in individual low-carbon behavior rewarding system on recycling behaviors. *Sustainable Production and Consumption*, 38, 90–103. <https://doi.org/10.1016/j.spc.2023.03.026>
- Jones, B. A., Madden, G. J., & Wengreen, H. J. (2014). The FIT Game: Preliminary evaluation of a gamification approach to increasing fruit and vegetable consumption in school. *Preventive Medicine*, 68, 76–79. <https://doi.org/10.1016/j.ypmed.2014.04.015>
- Karjaluoto, H., & Shaikh, A. A. (2016). Consumer engagement and behavioral intention toward continuous use of innovative mobile banking applications. *Journal of Financial Services Marketing*, 21(3), 260–270.
- Killeen, P. R. (1982). Incentive theory. *Nebraska Symposium on Motivation*, 29, 169–216.

- Killeen, P. R., Hanson, S. J., & Osborne, S. R. (1978). Arousal: Its genesis and manifestation as response rate. *Psychological Review*, 85(6), 571–581. <https://doi.org/10.1037/0033-295X.85.6.571>
- Kock, N., & Hadaya, P. (2018). Minimum sample size estimation in PLS-SEM. *Information Systems Journal*, 28(1), 227–261. <https://doi.org/10.1111/isj.12131>
- Koivisto, J., & Hamari, J. (2019). The rise of motivational information systems: A review of gamification research. *International Journal of Information Management*, 45, 191–210. <https://doi.org/10.1016/j.ijinfomgt.2018.10.013>
- Laroche, M., Bergeron, J., & Barbaro-Forleo, G. (2001). Targeting consumers who are willing to pay more for environmentally friendly products. *Journal of Consumer Marketing*, 18(6), 503–520.
- Law, M. M. S., Hills, P., & Hau, B. C. H. (2017). Engaging employees in sustainable development. *Business Strategy and the Environment*, 26(1), 84–97. <https://doi.org/10.1002/bse.1903>
- Le, T.-T., Lin, P.-T., Duc, D. T. V., Dang, T.-Q., & Nguyen, L.-T. (2025). Optimizing and restructuring resources for sustainable firm performance in the AI era. *Sustainable Futures*, 10, 101441. <https://doi.org/10.1016/j.sftr.2025.101441>
- Li, L., Hew, K. F., & Du, J. (2024). Gamification enhances student intrinsic motivation: A meta-analysis and systematic review. *Educational Technology Research and Development*, 72(2), 765–796. <https://doi.org/10.1007/s11423-023-10337-7>
- Liu, X., Zhou, Z., Yuen, K. F., & Wang, X. (2024). Green and gamified! An investigation of consumer participation in green last-mile. *Journal of Retailing and Consumer Services*, 79, 103808. <https://doi.org/10.1016/j.jretconser.2024.103808>
- Lopes, J. M., Gomes, S., Suchek, N., & Nogueira, S. (2024). The hidden reasons behind Generation Z's green choices. *Discover Sustainability*, 5(1). <https://doi.org/10.1007/s43621-024-00764-8>
- Lu, H. P., & Ho, H. C. (2020). Exploring the impact of gamification on users' engagement for sustainable development. *Sustainability*, 12(10). <https://doi.org/10.3390/su12104169>
- Mabalay, A. A. (2025). Gamification for sustainability: A systematic review. *Computers in Human Behavior*, 165, 108529. <https://doi.org/10.1016/j.chb.2024.108529>
- Meng, C., Zhao, M., Pan, Z., Pan, Q., & Bonk, C. J. (2024). Investigating the impact of gamification components on online learners' engagement. *Smart Learning Environments*, 11(1). <https://doi.org/10.1186/s40561-024-00336-3>
- Nguyen, L.-T., Phan, T.-T. C., & Dang, T.-Q. (2025). The power of interactive mobile advertising: How self-brand congruity shapes brand engagement in self-concept. *Journal of Creative Communications*. <https://doi.org/10.1177/09732586251359718>
- Ngo et al. (2024). Factors influencing Generation Z's intention to purchase sustainable clothing products in Vietnam.
- Pansari, A., & Kumar, V. (2017). Customer engagement: The construct, antecedents, and consequences. *Journal of the Academy of Marketing Science*, 45(3), 294–311. <https://doi.org/10.1007/s11747-016-0485-6>
- Parry, E., Farndale, E., Brewster, C., & Morley, M. J. (2021). Balancing rigour and relevance. *British Journal of Management*, 32(2), 273–282. <https://doi.org/10.1111/1467-8551.12405>
- Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research. *Annual Review of Psychology*, 63, 539–569. <https://doi.org/10.1146/annurev-psych-120710-100452>
- Prestopnik, N. R., & Tang, J. (2015). Points, stories, worlds, and diegesis: Comparing player experiences in two citizen science games. *Computers in Human Behavior*, 52, 492–506. <https://doi.org/10.1016/j.chb.2015.05.051>
- Rapp, A. (2020). An exploration of World of Warcraft for the gamification of virtual organizations. *Electronic Commerce Research and Applications*, 42, 100985. <https://doi.org/10.1016/j.elerap.2020.100985>
- Ratchford, B. T. (2001). The economics of consumer knowledge. *Journal of Consumer Research*, 27(4), 397–411.

- Ryan, R. M., & Deci, E. L. (1985). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78.
- Seaborn, K., & Fels, D. I. (2015). Gamification in theory and action: A survey. *International Journal of Human-Computer Studies*, 74, 14–31. <https://doi.org/10.1016/j.ijhcs.2014.09.006>
- Smiderle, R., Rigo, S. J., Marques, L. B., Coelho, J. A. P. M., & Jaques, P. A. (2020). The impact of gamification on students' learning, engagement and behavior based on their personality traits. *Smart Learning Environments*, 7(1). <https://doi.org/10.1186/s40561-019-0098-x>
- Sun, Y., & Xing, J. (2023). The impact of gamification motivation on green consumption behavior. *Sustainability*, 15(1). <https://doi.org/10.3390/su15010512>
- Takahashi, H., Shen, J., & Ogawa, K. (2016). An experimental examination of compensation schemes and level of effort in differentiated tasks. *Journal of Behavioral and Experimental Economics*, 61, 12–19. <https://doi.org/10.1016/j.socec.2016.01.002>
- Taufique, K. M. R., Siwar, C., Chamhuri, N., & Sarah, F. H. (2016). Integrating general environmental knowledge and eco-label knowledge. *Procedia Economics and Finance*, 37, 39–45. [https://doi.org/10.1016/S2212-5671\(16\)30090-9](https://doi.org/10.1016/S2212-5671(16)30090-9)
- Teo, T., & Noyes, J. (2011). An assessment of the influence of perceived enjoyment and attitude on the intention to use technology. *Computers & Education*, 57(2), 1645–1653. <https://doi.org/10.1016/j.compedu.2011.03.002>
- Terlutter, R., & Capella, M. L. (2013). The gamification of advertising. *Journal of Advertising*, 42(2–3), 95–112. <https://doi.org/10.1080/00913367.2013.774610>
- Theocharis, D., & Tsekouropoulos, G. (2025). Sustainable consumption and branding for Gen Z. *Sustainability*, 17(9). <https://doi.org/10.3390/su17094124>
- Tien, P. C. T., Nguyen, L. T., & Dang, T.-Q. (2023). Exploring the brand experience of Korean brands on customer interactions in Ho Chi Minh City, Vietnam: Non-linear structural equation modelling approach. In T. V. Tieng (Ed.), *Kỷ yếu hội thảo khoa học quốc tế Việt - Hàn 2023* (pp. 276–289). Information and Communications Publishing House.
- Tran, T.-T. T., Dang, T.-Q., Nguyen, L.-T., & Dang, D. T. V. (2025). Blockchain applications in value added tax refund: A deep learning-based dual-stage SEM-ANN analysis. *International Journal of Supply and Operations Management*, 12(3), 293–317. <https://doi.org/10.22034/ijssom.2025.110332.3054>
- Vietnam News. (2024, March 15). Việt Nam still witnesses large amount of plastic waste leaking into environment.
- Vo, T. H. N., Chau, T. H., & Dang, T.-Q. (2024). Intention to accept smart contracts based on blockchain technology in Vietnamese businesses. In L. T. Tung, N. H. Sinh, & P. Ha (Eds.), *Disruptive technology and business continuity: Proceedings of ICB 2023* (pp. 119–133). Springer. https://doi.org/10.1007/978-981-97-5452-6_9
- Volpp, K. G., John, L. K., Troxel, A. B., Norton, L., Fassbender, J., & Loewenstein, G. (2008). Financial incentive-based approaches for weight loss. *JAMA*, 300(22), 2631. <https://doi.org/10.1001/jama.2008.804>
- Wang, C., Zhang, X., & Sun, Q. (2021). The influence of economic incentives on residents' intention to participate in online recycling. *Resources, Conservation and Recycling*, 169. <https://doi.org/10.1016/j.resconrec.2021.105497>
- Woodruffe, C. (2006). The crucial importance of employee engagement. *Human Resource Management International Digest*, 14(1), 3–5. <https://doi.org/10.1108/09670730610643891>
- World Bank. (2021). Market study for Vietnam: Plastics circularity opportunities and barriers. World Bank.
- World Bank. (2022). Vietnam: Plastic pollution diagnostics. World Bank.
- Wut, T. M., Lee, D., & Lee, S. W. (2023). Does attitude or intention affect behavior in sustainable tourism? *Sustainability*, 15(19). <https://doi.org/10.3390/su151914076>

Xu, L., Yang, H., & Ling, M. (2023). Factors moderating the effect of financial incentives on household recycling. *Environmental Impact Assessment Review*, 100, 107078. <https://doi.org/10.1016/j.eiar.2023.107078>

Zsóka, Á., Szerényi, Z. M., Széchy, A., & Kocsis, T. (2013). Greening due to environmental education? *Journal of Cleaner Production*, 48, 126–138. <https://doi.org/10.1016/j.jclepro.2012.11.030>