

The impact of E-commerce gamification on Gen Z's impulsive spending behavior in Vietnam

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Abstract: *The rapid integration of gamification in e-commerce has transformed how consumers interact with online platforms, yet its influence on impulsive spending behavior remains underexplored, particularly among Generation Z in Vietnam. This study investigates the impact of e-commerce gamification on Generation Z's impulsive spending behavior, considering the mediating role of perceived enjoyment and the moderating effect of financial self-control. Drawing on the Stimulus–Organism–Response (SOR) framework and the cognitive–affective dimensions of the Theory of Mind (ToM), the study examines how gamified features such as rewards, challenges, and interactive elements stimulate emotional and cognitive responses that lead to impulsive purchasing. Data were collected from 309 Vietnamese Generation Z consumers through a structured online questionnaire, and Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed to test the proposed hypotheses. The results indicate that e-commerce gamification significantly enhances perceived enjoyment and directly promotes impulsive spending, while perceived enjoyment mediates the relationship between gamification and impulsive behavior. Financial self-control was found to reduce the effect of enjoyment on impulsive purchases. These findings provide theoretical insights into the psychological mechanisms linking gamification and impulsive consumption and offer practical guidance for online retailers seeking to engage Generation Z more effectively.*

Keywords: E-commerce gamification; financial self-control; generation Z; impulsive spending behavior; perceived enjoyment.

1. INTRODUCTION

E-commerce has significantly transformed consumer shopping habits, experiencing rapid growth over the past decade. This transformation is primarily driven by the widespread availability of the internet and the increasing use of smartphones, which have become essential tools for online shopping. Globally, e-commerce sales are projected to exceed \$5 trillion by 2025, highlighting the sector's rapid expansion. The Southeast Asia region in particular is emerging as a critical player in the global e-commerce landscape. With over 400 million internet users representing 70% of the region's population, Southeast Asia is witnessing remarkable growth in e-commerce activities (Kanaev, 2023). This growth is propelled by widespread internet access and a mobile-first approach, with 72.6% of users accessing the internet via smartphones. Within this rapidly evolving digital environment, e-commerce platforms are continuously adopting innovative strategies to attract and retain consumers, among which gamification has emerged as one of the most effective approaches for enhancing user engagement and interaction.

Gamification refers to the application of game-like elements such as points, rewards, badges, leaderboards, challenges and progress tracking in non-game contexts in order to motivate users and increase their level of participation (Aparicio et al., 2021). In the context of e-commerce,

gamification has been increasingly integrated into platform design to transform online shopping into a more interactive and entertaining experience. Many leading e-commerce platforms incorporate gamified features such as daily check-in rewards, spin-to-win games, coin collection systems, loyalty points, and interactive missions that encourage users to actively engage with the platform. These features are designed to stimulate enjoyment, competition, and reward anticipation, thereby enhancing the overall user experience. As a result, gamification has become an important digital marketing strategy that helps e-commerce platforms increase user retention, strengthen customer loyalty, and stimulate purchasing behavior. The impact of gamification is particularly significant among Generation Z (Pradhan et al., 2023), who are considered the first generation to grow up entirely in a digital environment. This generation is highly familiar with digital technologies, mobile applications, and online interactive experiences, making them more receptive to gamified systems embedded in online platforms. Generation Z consumers tend to seek entertainment, instant gratification, and engaging digital experiences when interacting with brands or online services. As a result, they are more likely to respond positively to gamification elements that provide rewards, challenges, and interactive experiences. The rapid development of digital infrastructure, combined with the high adoption rate of smartphones and social media platforms, has

created an ideal environment for the growth of innovative e-commerce strategies such as gamification in Vietnam.

Previous research has emphasized the role of website design, emotional responses, and environmental stimuli in shaping consumer behavior in online shopping contexts (Sands et al., 2018; Kastenholz et al., 2017). These studies primarily focused on optimizing online retail interfaces to enhance customer satisfaction and engagement. However, despite the growing popularity of gamification in digital platforms, there remains limited understanding of how gamification specifically affects impulsive spending behavior in e-commerce environments (García-Jurado et al., 2021; Aparicio et al., 2021). Much of the existing literature has concentrated on traditional website interfaces or physical retail settings, which do not fully capture the interactive, game-like experiences offered by modern e-commerce platforms (Cheng et al., 2020). While previous studies explored emotional triggers such as pleasure and arousal in driving consumer behavior (Sands et al., 2018; Kastenholz et al., 2017), they did not examine the influence of gamification mechanisms embedded in digital shopping environments.

Given the increasing integration of gamified features in e-commerce and the rising purchasing power of Generation Z, it is crucial to investigate how these elements affect impulsive spending behavior (Tien et al., 2023; Nguyen et al., 2023). This study focuses on gamified mechanisms implemented within e-commerce platforms and their impact on Generation Z consumers' purchasing decisions in Vietnam. By examining the interactive and emotionally engaging nature of gamified shopping experiences, the research aims to provide deeper insights into the psychological and behavioral drivers of impulse purchases. Understanding this relationship is particularly important because Generation Z represents one of the most active digital consumer groups and plays a pivotal role in shaping the future of online commerce. The findings are expected to contribute theoretically by extending knowledge on gamification and impulsive consumption, and practically by guiding e-commerce platforms in enhancing user experiences, boosting engagement, and maintaining competitiveness in the evolving digital marketplace. The study is divided into 5 parts including (1) Introduction; (2) Conceptual framework and hypothesis development; (3) Methodology; (4) Results and discussion; and (5) Implications and conclusion.

2. CONCEPTUAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

2.1 Theoretical foundations

This study is grounded in the Stimulus–Organism–Response (SOR) framework and the Cognitive and Affective Theory of Mind (ToM) to explain how e-commerce gamification influences Generation Z's impulsive spending behavior in Vietnam. The SOR model is widely used in consumer behavior research to examine how external stimuli affect individuals' internal states and behavioral responses. According to Xue Li et al. (2021), the SOR model is

commonly employed to investigate human reactions to environmental stimuli, while Chan et al. (2017) suggest that such stimuli lead to approach or avoidance behaviors. The framework consists of three components: stimulus (S), organism (O) and response (R), which provides a structured way to analyze consumer behavior in digital environments.

In the context of e-commerce, stimuli include gamification features, platform design, and personalized interactions that shape user experience. These external factors trigger internal cognitive and emotional responses (organism), which subsequently influence behavioral outcomes such as impulsive buying. Shen et al. (2021) highlight the significant relationship between platform design and user engagement in digital retail settings. Furthermore, Peltier et al. (2024) indicate that positive cognitive and emotional responses tend to increase impulsive purchasing behavior, whereas negative responses may reduce it. This suggests that gamification elements, by enhancing enjoyment and emotional arousal, can serve as powerful drivers of impulse buying among Gen Z consumers.

Complementing the SOR framework, the Theory of Mind (ToM) provides deeper insight into how consumers interpret and respond to these stimuli. ToM refers to the ability to understand and attribute mental states such as beliefs, intentions, and emotions to oneself and others (Gentina et al., 2021). This capability is crucial in explaining impulsive spending behavior, which is often driven by emotional and social factors such as the desire for immediate gratification and social influence (Tien et al., 2023). The cognitive and affective dimensions of ToM further explain how consumers process marketing stimuli and develop emotional reactions in interactive digital environments. Therefore, integrating SOR and ToM offers a comprehensive explanation of how gamification triggers internal psychological processes that lead to impulsive spending behavior among Generation Z in Vietnam.

2.2 E-commerce gamification

The rapid development of mobile technology and the widespread adoption of smartphones have significantly driven innovation in digital commerce, particularly the integration of game-like features into e-commerce platforms. This approach, known as gamification, refers to the use of game elements in non-game contexts to influence user behavior (Aparicio et al., 2021; Xi & Hamari, 2020). The main objective of gamification is to create engaging and rewarding experiences similar to games in order to affect users' cognitive and emotional responses, thereby encouraging participation and desired behaviors. As a result, gamification has become an effective strategy applied across various fields such as marketing, education, healthcare, and digital business environments. Unlike traditional games that primarily focus on entertainment, gamification aims to shape behavior within functional systems. It typically includes features such as progression paths, feedback and reward mechanisms (e.g., points, badges, rankings), social interaction elements, and

user-centered design to enhance engagement and motivation (Sharma et al., 2024; García-Jurado et al., 2021).

In the context of online retail, this concept is referred to as e-commerce gamification, which involves integrating game-like mechanisms into shopping platforms to improve user experience and influence purchasing behavior. By making the shopping process more interactive and enjoyable, gamification encourages users to spend more time on platforms and participate in promotional activities. The effectiveness of these elements depends on their ability to stimulate users' psychological responses and behavioral outcomes (Nguyen, et al., 2023). A typical example can be seen in Shopee, which incorporates various gamified features such as badge levels, virtual currency (coins), and lottery-based rewards. Users can earn coins through activities like daily check-ins or mini-games and redeem them for discounts, while features like the "Lucky Wheel" introduce randomness to increase excitement and engagement. These mechanisms reinforce a sense of achievement, social status, and continuous participation (Koivisto & Hamari, 2019).

Despite its growing adoption, academic research on e-commerce gamification remains relatively limited. Bitrián et al. (2024) report that only about 2.9% of gamification studies focus on e-commerce or e-services. Previous research such as Behl et al. (2020) has primarily examined consumer engagement rather than broader behavioral outcomes. In Vietnam, although some studies have begun to explore gamification and its psychological effects in digital contexts, empirical research focusing specifically on its impact on Generation Z's purchasing behavior is still lacking. Given that Gen Z represents a highly active digital consumer group, understanding how gamification influences their behavior is essential. Prior studies suggest that elements such as rewards, challenges, competition, and time-limited activities can stimulate emotional responses and encourage impulsive purchases. From a measurement perspective, e-commerce gamification is often evaluated through dimensions such as reward systems, competition, progression mechanisms, interactive challenges, and virtual currencies, which are operationalized through features like points, badges, leaderboards, lotteries, and progress indicators (García-Jurado et al., 2021; Aparicio et al., 2021).

2.3 Impulse spending behavior

Impulse spending behavior refers to spontaneous and unplanned purchasing actions executed without prior intention or extensive deliberation. Early studies describe it as purchases made without a previously recognized need, often driven by immediate emotional impulses rather than rational evaluation (Tsang et al., 2020; Bayley & Nancarrow, 1998). Such behavior is typically hedonic in nature, providing emotional satisfaction rather than utilitarian benefits, and is characterized by higher emotional intensity, irresistibility, and lower cognitive control compared to planned purchasing (Kacen & Lee, 2002; Zhang et al., 2020). While all impulse purchases are unplanned, not all unplanned purchases qualify as

impulsive, highlighting the importance of sudden urges and immediate decision-making as distinguishing factors.

In online shopping contexts, impulse buying has become increasingly prevalent due to the convenience, interactivity, and persuasive features of digital platforms. Akram et al. (2018) classify online impulse buying into four types—planned impulsive buying, suggestion impulsive buying, reminder impulsive buying, and pure impulse buying—reflecting the variety of triggers that prompt spontaneous purchases. These triggers include internal psychological impulses, such as hedonic desire or curiosity, as well as external stimuli, including promotional notifications, product recommendations, and gamified features (Costa et al., 2024). Time-limited promotions, such as "Flash Sale Shopee," can further amplify urgency and reduce deliberation, increasing impulsive decisions (Nyrhinen et al., 2024).

Gamification has emerged as a significant factor influencing digital impulse spending by creating interactive, entertaining, and emotionally engaging experiences. Platforms such as Shopee incorporate gamified features such as "Shaking coin to receive a voucher," "Shopee Farm," and "Shopee Gift" that encourage participation, reward-seeking, and continuous engagement, stimulating impulsive purchase behavior (Nguyen et al., 2023). These mechanisms leverage psychological drivers such as enjoyment, curiosity, and social recognition, which reduce cognitive resistance and facilitate spontaneous purchasing.

From a measurement perspective, impulse spending behavior in e-commerce can be assessed through indicators such as sudden purchase urges, lack of pre-planning, emotional excitement, and immediate decision-making. Online-specific measures include responses to gamified rewards, interactive features, time pressure, and promotional stimuli, providing a basis for analyzing how gamification influences Generation Z's impulsive spending behavior in Vietnam. Given their high engagement with digital platforms and familiarity with gamified experiences, Generation Z consumers are particularly susceptible to these stimuli, making them a critical target group for understanding gamification-driven impulse buying.

2.4 Hypothesis development

2.4.1. E-commerce gamification, perceived enjoyment and impulsive spending behavior

In the context of e-commerce, gamification can be conceptualized as an external stimulus within the SOR framework that enhances the interactivity and enjoyment of the online shopping experience. Gamification elements such as rewards, attraction, and autonomy act as stimuli that trigger internal psychological states, particularly perceived enjoyment, within users. These features introduce entertainment and interactive components into the shopping process, making the experience more engaging and appealing to consumers (García-Jurado et al., 2021). From the organism perspective, perceived enjoyment reflects users' intrinsic

emotional responses when interacting with gamified platforms, which may subsequently influence their behavioral outcomes.

From the perspective of intrinsic motivation and the cognitive-affective dimensions of ToM, users interpret and respond to gamified stimuli based on their internal beliefs, emotions, and psychological needs. Gamification elements can stimulate curiosity, sustain attention, and generate positive emotional responses, leading users to become more immersed in platform activities. This affective engagement enhances users' enjoyment and satisfaction during the interaction process. Moreover, gamified mechanisms have been found to improve users' perceptions of usability and ease of use, thereby strengthening their overall experience and encouraging prolonged engagement with online platforms (Rodrigues et al., 2013). These findings suggest that users' cognitive interpretations and emotional reactions play a critical role in shaping their perceived enjoyment. Furthermore, prior research emphasizes that internal psychological states such as enjoyment can influence behavioral intention and actual behavior. Tien Minh et al. (2023) provide strong empirical support for the relationship between intention and behavior through a meta-analysis of behavioral studies. Within the SOR framework, this implies that perceived enjoyment (organism) serves as a key mediator between gamification stimuli and user responses. Therefore, integrating SOR and ToM perspectives suggests that gamification mechanisms embedded in e-commerce platforms enhance users' perceived enjoyment through both cognitive interpretation and emotional engagement.

H1: E-commerce gamification positively influences perceived enjoyment among Gen Z.

Within the SOR framework, perceived enjoyment is considered an internal affective state (organism) that influences behavioral responses. Perceived enjoyment refers to the extent to which an activity is perceived as pleasurable and satisfying in itself, and it plays an important role in shaping consumers' online behavior. In digital environments, enjoyable experiences increase user engagement and encourage prolonged interaction with platforms. According to flow theory, intrinsic enjoyment can stimulate exploratory behavior, thereby increasing the likelihood of spontaneous purchasing during online shopping (Wu et al., 2020). Additionally, the convenience of online platforms allows consumers to shop anytime and access products instantly, which further facilitates impulsive purchasing decisions.

From the perspective of the cognitive and affective dimensions of Theory of Mind (ToM), consumers' emotional responses significantly influence their purchasing behavior. Positive emotions such as enjoyment and excitement can reduce cognitive control and increase susceptibility to impulse buying. Beatty & Ferrel (1998) found that consumers experiencing positive emotions during shopping are more likely to develop impulse purchase urges. Similarly, engagement with digital content and narrative involvement

enhances emotional attachment and encourages spontaneous decisions. In social media contexts, interactive communication with influencers further increases consumer engagement and product interest (Koufaris, 2002). These findings suggest that perceived enjoyment can directly stimulate impulsive spending behavior through emotional and cognitive processes.

H2: Perceived enjoyment positively influences Gen Z's impulsive spending behavior.

Similarly, e-commerce gamification can be viewed as an external stimulus that directly influences consumers' behavioral responses, and it refers to the integration of game design elements such as rewards, challenges, points, and competitions into non-game contexts to enhance user engagement (Morschheuser et al., 2017). In e-commerce environments, gamified features create interactive and stimulating experiences that encourage users to engage more frequently with the platform. Common elements such as points, badges, and leaderboards (PBL triad) function as motivational tools that promote continuous participation and interaction (Paixão et al., 2021). From a ToM perspective, consumers interpret these gamified elements based on their psychological needs for achievement, social recognition, and competition. Features such as rewards, feedback, and status recognition enhance users' motivation to participate in platform activities and increase their exposure to products and promotional content (García-Jurado et al., 2021). As users interact more frequently with the platform, they encounter more purchasing opportunities, which may lead to spontaneous buying decisions. Therefore, gamification not only enhances engagement but can also directly stimulate impulsive purchasing behavior by influencing both cognitive evaluation and emotional responses.

H3: E-commerce gamification positively influences Gen Z's impulsive spending behavior.

Perceived enjoyment plays a central role in linking gamified experiences with consumers' behavioral outcomes in e-commerce environments. When users interact with gamification features such as rewards, challenges, and interactive activities, they are more likely to experience pleasure and satisfaction during the shopping process. These enjoyable experiences enhance the overall user experience and create hedonic value, which can influence purchasing behavior. Prior studies indicate that perceived enjoyment reflects intrinsic motivation and user satisfaction when interacting with digital platforms (Noorbehbahani et al., 2019; Lacap et al., 2023). In interactive digital environments, consumers actively interpret gamified features and develop emotional responses such as excitement, curiosity, and engagement. These positive affective states can increase users' involvement with the platform, sustain their attention, and encourage continued interaction. As users become more immersed in these experiences, their decision-making process may become less deliberative, making them more susceptible to spontaneous purchasing. In this way, emotional engagement derived from enjoyable experiences acts as a key mechanism

that transforms platform interaction into actual purchasing behavior. Taken together, these arguments suggest that perceived enjoyment serves as an important psychological pathway through which gamification influences impulsive buying. By enhancing users' emotional engagement and reducing cognitive resistance, enjoyment strengthens the effect of gamified stimuli on behavioral outcomes.

H4: Perceived enjoyment mediates the relationship between e-commerce gamification and Gen Z's impulsive spending behavior.

2.4.2. The moderating role of financial self-control

Financial self-control plays an important role in regulating individuals' spending behavior, particularly in situations that may trigger impulsive consumption. Self-control refers to the ability to regulate one's actions and suppress impulses in order to avoid undesirable behaviors such as excessive or impulsive spending (Moayery et al., 2019). It also reflects the capacity to discipline oneself to resist temptations and avoid purchases that may later lead to regret. Self-control involves not only willpower but also mental and behavioral strategies that help individuals manage tempting stimuli. Mental strategies focus on changing how individuals perceive tempting stimuli, while behavioral strategies involve manipulating situational conditions to reduce exposure to temptation (Artadita & Firmialy, 2024).

According to Averill's perspective, self-control consists of three aspects: behavioral control, cognitive control, and decision control. Behavioral control refers to the readiness to respond in ways that can influence or modify a situation, cognitive control refers to the ability to interpret and process information in a way that reduces stress, and decision control refers to the ability to choose actions based on personal beliefs or rational considerations. Previous studies have shown that individuals with stronger self-control are more capable of reducing unnecessary spending. For example, in online gaming contexts, players with higher levels of self-control are less likely to make impulsive in-game purchases (Yani, 2025). In addition, hedonistic motivations may increase consumers' tendency to engage in impulsive consumption. Hedonism refers to a lifestyle that prioritizes pleasure and enjoyment as the primary goal of life. In consumption contexts, individuals often shop for emotional satisfaction or instant gratification rather than functional needs (Nur et al, 2025). Young consumers such as Generation Z are particularly vulnerable to these influences due to peer pressure and exposure to social media and promotional content, which can create immediate purchase desires.

In e-commerce environments, enjoyable shopping experiences created by interactive platform features may increase consumers' perceived enjoyment and stimulate impulsive spending behavior. However, individuals with stronger financial self-control are more capable of regulating their emotional responses and resisting impulsive spending. Therefore, financial self-control is expected to moderate the

relationship between perceived enjoyment and impulsive spending behavior.

H5: Financial self-control moderates the relationship between perceived enjoyment and Gen Z's impulsive spending behavior.

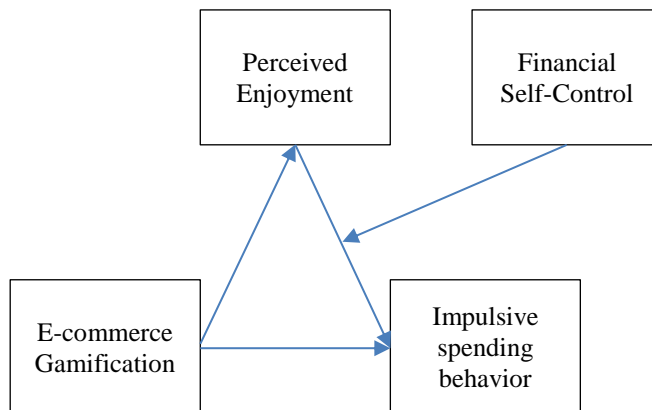


Figure 1: Research model

3. METHODOLOGY

3.1 Measures and questionnaire development

The measurement instrument for this study was developed based on previously validated scales from prior research on e-commerce, gamification, and consumer behavior. The questionnaire included four key constructs: E-commerce Gamification (EG), Perceived Enjoyment (PE), Impulsive spending behavior (IBB), and Financial Self-Control (FSC).

All measurement items were adapted and refined to ensure their suitability for the context of e-commerce platforms in Vietnam while maintaining their original theoretical meanings. Specifically, IBB was measured using five items adapted from Wu et al. (2020) and Koufaris (2002). EG was assessed using four items based on García-Jurado et al. (2021) and Tien Minh et al. (2023). PE was measured using three items adapted from Lacap et al. (2023) and Wang & Li (2012), while FSC was measured using four items derived from Artadita & Firmialy (2024) and Yani (2025).

All items were measured using a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"), which is widely applied in consumer behavior research. Prior to the main data collection, a pilot test was conducted with a small group of respondents to ensure the clarity, readability, and reliability of the measurement items.

3.2 Sample, data collection and analysis

The data for this study were collected through a structured questionnaire administered to Vietnamese consumers to examine the impact of e-commerce gamification on Generation Z's impulsive spending behavior. The questionnaire was distributed both direct and indirect ways through online channels, including social media platforms,

university networks, and online communities where Gen Z users are highly active. These approaches allowed the study to reach a broad group of respondents who frequently engage in online shopping activities and interact with gamified features on e-commerce platforms.

The sampling strategy specifically targeted Generation Z consumers in Vietnam, as this generation represents one of the most active groups in the digital marketplace and is highly familiar with gamified experiences integrated into online platforms. To capture demographic and behavioral characteristics that may influence impulsive spending behavior, the questionnaire included several demographic measures such as gender (male, female), occupation (student, employed, self-employed, or unemployed), and monthly income (<5 million VND, 5–10 million VND, 10–30 million VND, and >30 million VND). In addition, respondents were asked to report their e-commerce usage frequency (daily, 6–15 times per month, 1–5 times per month, or rarely), the platform they use most frequently (Shopee, Lazada, TikTok Shop, Tiki, or others), and their average spending per purchase (<1 million VND, 1–5 million VND, or >5 million VND). These characteristics were included because demographic factors and online shopping habits may influence consumers' engagement with gamification features and their tendency toward impulsive purchasing. A total of 309 valid responses were collected and included in the dataset for analysis. The diversity of respondents in terms of gender, occupation, income levels, and e-commerce usage behaviors provided a suitable basis for examining how gamification elements on e-commerce platforms influence impulsive spending behavior among Generation Z consumers in Vietnam.

For data analysis, this study employed Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS3 to evaluate the reliability and validity of the measurement model and to test the proposed hypotheses

4. RESULTS AND DISCUSSION

4.1 Demographics of respondents

Table 1 summarizes the demographic and online shopping characteristics of the respondents participating in this study on the impact of e-commerce gamification on Generation Z's impulsive spending behavior in Vietnam. Among the 309 respondents, females accounted for the majority with 180 participants (58.3%), while males represented 129 participants (41.7%). This distribution reflects the active participation of female consumers in online shopping and engagement with gamified features on e-commerce platforms. Regarding occupation, students constituted the largest proportion of the sample, with 176 respondents (56.9%), followed by employed individuals with 92 respondents (29.8%). A smaller number of respondents were self-employed (21 respondents, 6.8%) or unemployed (20 respondents, 6.5%). This structure is consistent with the characteristics of Generation Z, who are largely students or early-career workers and are highly active in digital environments.

In terms of monthly income, nearly half of the respondents reported earning less than 5 million VND per month (144 respondents, 46.6%), followed by those earning between 5 and 10 million VND (92 respondents, 29.8%). Meanwhile, 57 respondents (18.4%) reported income levels between 10 and 30 million VND, and only 16 respondents (5.2%) reported earning more than 30 million VND per month. These figures reflect the relatively moderate income levels typical of Generation Z consumers, which may influence their spending decisions and responsiveness to gamified promotions such as discounts, rewards, and promotional games.

Table 1: Demographics of respondents

Demographics		Frequency	Percent (%)
Gender	Male	129	41.7
	Female	180	58.3
Occupation	Student	176	56.9
	Employed	92	29.8
	Self-employed	21	6.8
	Unemployed	20	6.5
Monthly Income	< 5 millions VND	144	46.6
	5 - 10 millions VND	92	29.8
	10 - 30 millions VND	57	18.4
	> 30 millions VND	16	5.2
E-commerce Usage Frequency	Daily	126	40.8
	6–15 times per month	92	29.8
	1–5 times per month	68	22.0
	Rarely	23	7.4
Most Used Platform	Shopee	167	54.0
	Lazada	46	14.9
	TikTok Shop	71	23.0
	Tiki	15	4.9
	Others	10	3.2
Average Spending per Purchase	< 1 millions VND	181	58.6
	1–5 millions VND	102	33.0
	> 5 millions VND	26	8.4
Total		309	100

With respect to e-commerce usage behavior, a large proportion of respondents reported using e-commerce

platforms on a daily basis (126 respondents, 40.8%), while 92 respondents (29.8%) reported using them between 6 and 15 times per month. Additionally, 68 respondents (22.0%) used e-commerce platforms 1–5 times per month, and only a small number indicated that they rarely used such platforms (23 respondents, 7.4%). This high level of engagement suggests that Gen Z consumers frequently interact with digital shopping environments where gamification elements are commonly implemented. In terms of platform preference, Shopee was identified as the most frequently used e-commerce platform, accounting for 167 respondents (54.0%). TikTok Shop ranked second with 71 respondents (23.0%), followed by Lazada with 46 respondents (14.9%). A smaller proportion of respondents reported using Tiki (15 respondents, 4.9%) or other platforms (10 respondents, 3.2%). The dominance of these platforms is particularly relevant to the study because they actively incorporate gamification features such as reward points, mini-games, and promotional campaigns that may stimulate impulsive spending behavior.

Finally, regarding spending behavior, the majority of respondents reported spending less than 1 million VND per purchase (181 respondents, 58.6%). Meanwhile, 102 respondents (33.0%) indicated that they typically spend between 1 and 5 million VND per purchase, and only 26 respondents (8.4%) reported spending more than 5 million VND. These results suggest that although most Gen Z consumers make relatively small transactions, frequent exposure to gamified incentives on e-commerce platforms may encourage spontaneous or impulsive purchases.

4.2 Scale reliability and validity assessment

Table 2 presents the results of construct reliability and convergent validity. The Cronbach’s Alpha values for the main constructs, including E-commerce Gamification (0.881), Financial Self-Control (0.908), Impulsive spending behavior (0.941), and Perceived Enjoyment (0.919), all exceed the recommended threshold of 0.70, indicating satisfactory internal consistency. Similarly, the Composite Reliability values range from 0.918 to 0.955, further confirming strong construct reliability. The Average Variance Extracted (AVE) values for all constructs range from 0.737 to 0.861, exceeding the minimum recommended value of 0.50. This indicates that each construct explains a substantial portion of the variance of its indicators and demonstrates adequate convergent validity.

Table 2: Construct Reliability and Validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
EG	0.881	0.885	0.918	0.737
PE	0.919	0.920	0.949	0.861
FSC	0.908	0.944	0.935	0.782

IBB	0.941	0.942	0.955	0.809
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Source: Data analysis by SmartPLS3

The moderating effect construct shows values of 1.000 for Cronbach’s Alpha, Composite Reliability, and AVE because it is created as an interaction term in the model rather than measured by multiple indicators. Overall, the results confirm that the measurement model demonstrates satisfactory reliability and convergent validity, supporting its suitability for further structural model analysis.

Table 3 presents the discriminant validity results using both the Fornell–Larcker criterion and the Heterotrait–Monotrait ratio (HTMT). According to the Fornell–Larcker criterion, the square root of the Average Variance Extracted (AVE) for each construct is higher than its correlations with other constructs. Specifically, the square root of AVE values for E-commerce Gamification (0.858), Financial Self-Control (0.884), Impulsive spending behavior (0.899), and Perceived Enjoyment (0.928) exceed their corresponding inter-construct correlations. This indicates that each construct is empirically distinct and captures different conceptual dimensions within the research model.

Table 3: Fornell-Larcker Criterion and Heterotrait-Monotrait Ratio (HTMT)

		EG	FSC	IBB	Moderating Effect 1	PE
Fornell-Larcker Criterion	EG	0.858				
	FSC	0.618	0.884			
	IBB	0.412	0.340	0.899		
	Moderating Effect 1	0.077	0.436	0.186	1.000	
	PE	0.587	0.698	0.504	0.240	0.928
Heterotrait-Monotrait Ratio	EG					
	FSC	0.690				
	IBB	0.448	0.353			
	Moderating Effect 1	0.086	0.445	0.193		

	Effect 1					
	PE	0.650	0.764	0.541	0.251	

Source: Data analysis by SmartPLS3

In addition, the HTMT values between constructs range from 0.086 to 0.764, all of which are below the recommended threshold of 0.85, further confirming adequate discriminant validity. The moderating effect construct shows a value of 1.000 in the Fornell–Larcker criterion because it is created as an interaction term rather than measured by multiple indicators. Overall, these results demonstrate that the measurement model satisfies the required criteria for discriminant validity, indicating that the constructs are sufficiently distinct from one another and suitable for subsequent structural model analysis.

4.3 Research model assessment

Table 4 presents the estimates of the structural model, including path coefficients, standard deviations, T-statistics, and significance levels (p-values) for the hypothesized relationships. The model’s explanatory power is indicated by the adjusted R2 values as 0.342 for perceived enjoyment (PE) and 0.303 for impulse spending behavior (IBB).

The path coefficient from e-commerce gamification (EG) to perceived enjoyment (PE) is 0.587, with a T-value of 12.837 and $p < 0.001$. This indicates a strong and statistically significant positive effect. Therefore, H1 is supported, suggesting that gamification features embedded in e-commerce platforms substantially enhance users’ enjoyment. This aligns with previous findings that game-like elements increase user engagement and intrinsic satisfaction (García-Jurado et al., 2021; Lacap et al., 2023).

The path from PE to IBB has a coefficient of 0.444 ($T = 5.121$, $p < 0.001$), confirming a significant positive relationship. H2 is supported, indicating that higher perceived enjoyment encourages impulsive purchases among Gen Z consumers. This result is consistent with SOR and ToM perspectives, where positive affective responses mediate the translation of enjoyable experiences into spontaneous purchasing behavior (Beatty & Ferrel, 1998; Wu et al., 2020).

Table 4: Structural Equation Modelling Results Estimates

Paths	Original Sample	Sample Mean	S.D	T Statistics	P Values
EG → PE	0.587	0.590	0.046	12.837	0.000
PE → IBB	0.444	0.445	0.087	5.121	0.000
EG → IBB	0.344	0.340	0.092	3.735	0.000

EG → PE → IBB	0.261	0.263	0.056	4.631	0.000
FSC → IBB	-0.282	-0.280	0.120	2.343	0.020
Moderating Effect 1 → IBB	-0.159	-0.159	0.051	3.142	0.002
<i>Adjusted R²: PE: 0.342; IBB: 0.303</i>					

Source: Data analysis by SmartPLS3

The direct path from EG to IBB has a coefficient of 0.344 ($T = 3.735$, $p < 0.001$), supporting H3. This indicates that gamification can directly stimulate impulsive spending behavior beyond its effect through perceived enjoyment. The result suggests that gamified features such as points, badges, and leaderboards not only generate enjoyment but also encourage engagement that leads to immediate purchasing decisions (Morschheuser et al., 2017; Paixão et al., 2021).

The indirect effect of EG on IBB through PE is 0.261 ($T = 4.631$, $p < 0.001$). This significant mediation effect supports H4, showing that perceived enjoyment partially mediates the relationship between gamification and impulse spending behavior. In other words, gamification enhances enjoyment, which then increases the likelihood of impulsive purchases. This finding confirms the theoretical integration of SOR and ToM: external stimuli (gamification) trigger internal affective states (enjoyment), which translate into behavioral responses (IBB).

Financial self-control (FSC) shows a negative effect on IBB ($\beta = -0.282$, $T = 2.343$, $p = 0.020$). The finding indicates that higher levels of financial self-control reduce impulsive buying. This negative coefficient contrasts with the positive effects of gamification and enjoyment, highlighting that personal regulatory factors can counteract external stimuli. The moderating effect is also significant and negative ($\beta = -0.159$, $T = 3.142$, $p = 0.002$), which confirms H5. The finding suggests that the moderating variable weakens the impact of independent variables on IBB.

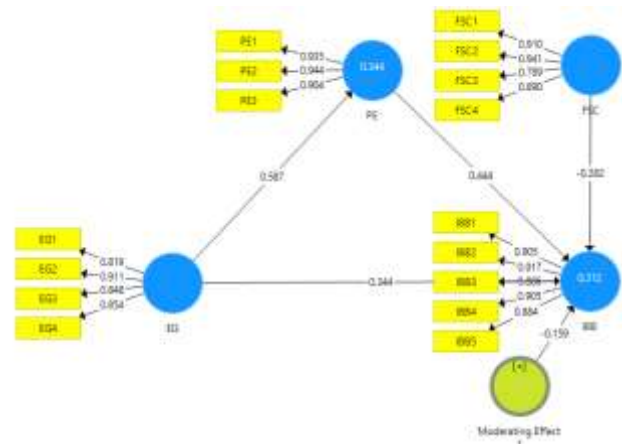


Figure 2: PLS bootstrapping model*Source: Data analysis by SmartPLS3*

4.4 Discussion of findings

The results show a strong positive effect of e-commerce gamification on perceived enjoyment. This aligns with the practical observation in Vietnam, where platforms like Shopee, Lazada, and Tiki have successfully integrated gamified features such as coin collection, flash games, lucky draws, and leaderboard competitions. These mechanisms not only attract users to spend more time on the platforms but also enhance the hedonic and playful aspects of online shopping. Young Vietnamese consumers, particularly Gen Z, value entertainment and interactive experiences, which explains why gamification is highly effective in stimulating enjoyment and engagement in this market.

Perceived enjoyment positively influences impulse spending behavior. This suggests that the more enjoyable the shopping experience, the higher the likelihood of spontaneous purchases. In the Vietnamese context, online shoppers often browse e-commerce platforms during leisure time, motivated not only by product needs but also by entertainment. Gamified experiences such as daily check-ins or virtual games trigger positive emotions, which can reduce cognitive deliberation and increase impulsive buying. This finding mirrors practical patterns in Vietnam, where time-limited promotions combined with gamification often result in sudden purchase spikes, especially among young consumers who are more responsive to engaging, interactive digital environments.

The analysis also indicates that e-commerce gamification directly affects impulsive spending behavior. This direct effect suggests that gamification not only enhances enjoyment but also motivates immediate behavioral responses. In practice, Vietnamese e-commerce platforms design gamification to encourage repeated interactions such as earning coins for purchases or participating in mini-games, which can prompt users to make unplanned purchases without deliberation. This explains the growing trend of flash sales and gamified campaigns generating high transaction volumes in a short period, demonstrating a clear link between digital incentives and spontaneous spending behavior in Vietnam.

It is also confirmed as perceived enjoyment partially mediates the relationship between gamification and impulsive spending behavior. This indicates that gamified experiences lead to impulsive purchasing not only directly but also through enhancing enjoyment. For Vietnamese Gen Z consumers, hedonic satisfaction is a key driver of online engagement. When gamification increases pleasure and fun, it strengthens the psychological mechanism behind impulsive purchases. Platforms such as Shopee's "Lucky Draw" or Lazada's interactive voucher games illustrate how perceived enjoyment bridges external gamification and internal purchase motivation.

Finally, financial self-control negatively affects impulsive spending behavior, which suggests that individuals with stronger self-control are less likely to make impulsive purchases. In Vietnam, this may explain variations among Gen Z consumers that while gamification stimulates impulse buying, those with higher financial literacy or deliberate spending habits are less influenced. This highlights the role of personal regulation as a counterbalance to the persuasive and entertaining mechanisms of e-commerce platforms. Besides, the negative moderating effect indicates that the influence of gamification and enjoyment on impulsive spending behavior can be weakened by moderating factors. In Vietnam, such factors could include awareness of overspending, social influence, or prior experience with online shopping, which temper the impact of gamification on impulsive behavior. This reflects the practical reality that while gamified features are effective, individual differences and contextual awareness still shape purchasing outcomes.

5. IMPLICATIONS AND CONCLUSION

This study advances the theoretical understanding of consumer behavior in digital commerce by integrating the Stimulus–Organism–Response (SOR) framework with the Cognitive and Affective Theory of Mind (ToM) to explain the mechanisms underlying Gen Z's impulsive buying behavior in Vietnam. The findings demonstrate that e-commerce gamification functions as an external stimulus that triggers internal cognitive and emotional processes, which subsequently influence behavioral responses. By applying the SOR framework, the research highlights how gamified features such as rewards, points, badges, and interactive challenges create hedonic value and increase engagement, thereby enhancing perceived enjoyment and promoting spontaneous purchases. Incorporating the ToM perspective provides deeper insight into the cognitive and emotional interpretations that shape consumer decision-making. The results indicate that consumers' beliefs, intentions, and emotional responses mediate the effects of gamification on impulse buying behavior. This integration emphasizes the importance of understanding not only external stimuli but also the internal psychological mechanisms that drive online purchasing behavior. The partial mediation of perceived enjoyment further supports the role of affective responses as a bridge between system design and behavioral outcomes, offering a nuanced explanation of how gamification operates in e-commerce contexts. The study also contributes to the literature by examining the role of individual differences, specifically financial self-control, in moderating the impact of gamification on impulsive buying. Findings show that higher self-control reduces the likelihood of impulsive purchases, suggesting that consumer characteristics interact with digital stimuli to shape behavior. This highlights the need to consider both environmental and personal factors in models of online consumer behavior, expanding the theoretical scope of SOR and ToM in the context of digital commerce. Overall, the research provides a comprehensive theoretical framework that combines external stimuli, internal psychological

mechanisms, and individual differences to explain how gamified e-commerce platforms influence impulsive buying among Gen Z. This contribution extends existing theories by situating them within the specific cultural and technological context of Vietnam, offering a richer understanding of digital consumer behavior in emerging markets.

The findings offer actionable insights for e-commerce platforms, marketers, and consumer educators in Vietnam seeking to engage Generation Z effectively. Gamification emerges as a powerful tool to enhance user experience and stimulate impulsive buying, suggesting that platforms should strategically design interactive and rewarding systems. Features such as points, badges, leaderboards, mini-games, and time-limited challenges not only capture attention but also create a sense of achievement, progress, and social recognition, making shopping more enjoyable and engaging. By emphasizing hedonic and interactive elements, platforms can increase dwell time, participation in promotions, and purchase frequency among young consumers.

The mediating role of perceived enjoyment highlights the importance of emotional design in e-commerce platforms. Marketers should consider gamification not simply as a functional add-on but as a mechanism to evoke pleasure, curiosity, and excitement. Interactive storytelling, personalized challenges, and social sharing functions can amplify these affective experiences, creating an immersive environment that encourages spontaneous purchases. For example, integrating gamified mini-games linked to discount vouchers or limited-time rewards can transform routine browsing into playful experiences, which has proven effective in the Vietnamese digital marketplace.

The negative impact of financial self-control on impulsive buying suggests that platforms must balance stimulation with responsible consumption. While gamification can drive engagement and sales, excessive use of time-limited promotions or psychologically persuasive mechanisms may lead to overconsumption, particularly among younger users. This presents opportunities for ethically designed features, such as in-app reminders, spending trackers, or optional “pause” functions, allowing users to enjoy gamified experiences without compromising financial well-being.

Finally, the findings emphasize the value of personalization. Gamification elements should be tailored to users’ preferences, engagement patterns, and social motivations to maximize effectiveness. In Vietnam, where Gen Z is highly tech-savvy and socially connected, integrating community-based competitions, leaderboards, and collaborative challenges can further reinforce participation while fostering brand loyalty. By aligning gamification strategies with both enjoyment and responsible engagement, e-commerce platforms can create sustainable growth while enhancing the overall digital shopping experience.

This study still remains some limitations while focusing on a specific context as e-commerce gamification and Gen Z

in Vietnam, which may limit its applicability to other industries, platforms, or cultural settings. It also examines only selected gamification features and psychological factors, leaving out potential influences such as social norms, personality traits, or platform trust. Future research could expand to different sectors, incorporate additional constructs, and use longitudinal designs to explore how gamification impacts consumer behavior over time.

6. ACKNOWLEDGMENT

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7. REFERENCES

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