

## The Influence of Gamification on Impulsive Buying in Shopee Live: An Analysis Based on Gender and Age Moderation

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### Abstract

#### Keywords

Gamification; Impulsive Buying; Shopee Live; S-O-R Framework; Gender.

This study aims to analyze the influence of gamification elements within the Shopee Live platform on consumer impulsive buying behavior, with a specific focus on the moderating roles of age and gender. Utilizing the Stimulus-Organism-Response (S-O-R) framework, this research evaluates four key gamification elements as stimuli: Interactivity, Time Pressure, Competition, and Rewards. The research methodology employed an experimental design with data collection via structured questionnaires using a 1-5 Likert scale. The respondents included both Generation Z and Millennials to compare responses between digital natives and digital immigrants. The data were analyzed to determine how these stimuli affect the viewers' psychological states including Immersion, Sense of Presence, and Active Intensity ultimately leading to impulsive buying decisions. The findings indicate that Interactivity and Time Pressure are the primary triggers that significantly influence the psychological conditions of viewers. Among these psychological variables, Immersion was found to have the most dominant influence on the tendency toward impulsive buying behavior. While Competition and Rewards elements did not show a significant impact on emotional engagement in this context, moderation analysis revealed a key finding: Time Pressure exerts a much stronger emotional impact on female respondents compared to males. Furthermore, the study identified a convergence in digital behavior, showing no significant difference between Generation Z and Millennials in their response to these interactive features. These findings provide practical implications for e-commerce platforms and sellers (hosts) to prioritize personalized two-way interaction features over standard points or rewards

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### INTRODUCTION

In recent years, the popularity of mobile devices has grown rapidly, this has increased the innovations developed, one of which is gamification, which is known as the implementation of game elements into non-game contexts to encourage a certain behavior. García-Jurado et al., (2021) say that this development of gamification indirectly encourages innovative, adaptive, effective and efficient technological advances that can be applied to various aspects such as health, marketing and advertising, the environment, teamwork, employment, education, and crowdsourcing.

Along with the development of technology in the modern era, it is easier for people to meet primary, secondary, and tertiary needs effectively and efficiently (Harini et al. 2024; Hu, Yu, and Chen 2023; Touriano et al. 2023). One of the positive impacts of technological developments is the ease of conducting online buying and selling transactions through e-commerce, namely the use of electronic media for goods and services trading activities which now covers various needs of the community, such as food, clothing, electronics, and transportation (Syatra & Wangdra, 2018).

According to the Indonesian Ministry of Trade, the development of the Gross Merchandise Value (GMV) of e-commerce in Indonesia in the 2019–2023 period shows a significant increase with the number of users reaching 58.63 million and projected to increase to 99.1 million users by 2029, which shows that people are increasingly choosing online-based transactions (Ministry of Trade, 2023). The availability of creative product videos and reviews from buyers also makes it easier for consumers to obtain product information without having to visit the store directly. García-Jurado et al. (2021) also emphasized that e-commerce is one of the drivers of economic growth in various countries.

Based on the We Are Social report, in January 2024 around 56.1% of global internet users will shop online every week, with Thailand occupying the highest position at 66.9%, followed by South Korea at 65.8%, while Indonesia is ranked ninth with a proportion of 59.3%, equivalent to India (Annur, 2024). The report also shows that women are more active in online shopping than men, especially in the age groups of 35–44 years and 25–34 years. One form of e-commerce development that is increasingly popular is mobile commerce (m-commerce), which is a buying and selling activity through mobile devices that provides easy access for users. As mobile device technology develops, more and more people are using these platforms to make online transactions because they are considered more practical, fast, and flexible (Zhang et al., 2022).

Soenarso, (2021) emphasized that in this era of digitalization, e-commerce platforms do not only affect large stores. Currently, many MSME stores have begun to switch to taking advantage of the convenience offered by e-commerce. Shopee and Tokopedia are top-tier competitors in Indonesia today when compared to other e-commerce based on the number of visitors or users (Soenarso, 2021).

One of the promotional methods in e-commerce is live streaming. The live streaming shop was started by Shopee Live and then by other e-commerce platforms, namely TikTok Shop, Lazlive, and Tokopedia Play. The live streaming feature is generally carried out in real-time where the seller/host of this live stream directly interacts in the form of promo offers, providing description information of the available products (Lee & Chen, 2021). With this, users can directly buy products through the link linked on the page on the live stream. This live streaming shop feature is one of the implementations of Gamification which is considered successful in increasing sales traffic both from the side of traders and consumers themselves. With this high transaction traffic, it will indirectly cause impulsive behavior in consumers in shopping, especially online.

According to Burhanudin, (2021) in the SnapCart study in the third quarter of 2021, Shopee had the most users at 51%, followed by Tokopedia with 27% and Lazada with 11% (Burhanudin, 2021). The rise of e-commerce competition in this digital era in Indonesia is dominated by Shopee as the main choice that has been studied by previous researchers.

The main thrust of this study is to observe impulsive behavior and how age and gender differences moderate responses to gamification elements, especially between digital natives (born after 1980) and digital immigrants (born before 1980). Digital natives are younger and tend to be familiar with Web 2.0 technology and multitasking, so they are more responsive to competitive gamification elements (Helsper & Eynon, 2010; Helsper, Dutton, & Gerber, 2008).

In contrast, digital natives are more focused on economic benefits. They are more responsive to gamification that prioritizes prizes that have economic value and can increase social interaction through financial benefits, such as giving gifts in the form of energy and red envelopes during buying and selling transactions (Helsper & Eynon, 2010; Helsper, Dutton, & Gerber, 2008).

Shopee Live was chosen as the platform for this study because it has a live streaming feature that allows direct interaction between sellers and consumers. These interactions can increase buyer engagement and trust, which is an important element in driving impulse buying decisions. In addition, Shopee is a pioneer of live streaming shopping platforms in Indonesia, which has made the most of this feature to increase engagement and sales conversions. Gamification is applied to add an element of entertainment and motivation to the online shopping experience, thereby encouraging impulse buying behavior. Gamification elements, such as points, badges, leaderboards, and challenges, serve to increase consumers' emotional and social engagement, provide fun, and create an urgency to buy products that they may not have considered before and also the selection of Shopee was made because of its success in integrating gamification elements that have proven to be effective in increasing engagement and impulse purchases in its users. In addition, by focusing research on a single platform, the analysis carried out can be more in-depth and detailed. Comparing different platforms can expand the scope, but it will reduce the depth of analysis, and require more time, data, and resources. Therefore, this study is more focused on Shopee to obtain more accurate and relevant results.

The urgency of this research is underscored by the rapid growth of live streaming commerce in Indonesia, where platforms like Shopee have become dominant players, and the need for marketers to optimize gamification strategies to enhance consumer engagement and conversion. The novelty of this study lies in its examination of four gamification elements within a live streaming context using the S-O-R framework, with a specific focus on age and gender as moderating variables.

Based on the background that has been presented, this study focuses on the influence of gamification elements in Shopee Live on consumer impulse purchase behavior, the role of age and gender as moderation variables in the relationship, as well as the optimization of gamification strategies to increase sales engagement and conversion. This study assumes that gamification elements, such as direct interaction between hosts and consumers, host characteristics, limited-time promotions, quality of logistics services, urgency of promotions, and the phenomenon of Fear of Missing Out (FOMO), have a positive effect on impulse purchases through increased consumer trust and value. In addition, the response to gamification is influenced by demographic characteristics, where Generation Z tends to be attracted to competitive elements such as leaderboards, while millennials are more responsive to economic incentives such as discounts; Men tend to prefer challenges and competition, while women are more interested in value-based promotions. This study was limited to the use of Shopee Live as the object of the study, focusing on the influence of gamification, promotion urgency, and host involvement on impulse purchases during live streaming sessions, without considering other factors such as product prices, service quality, return policies, long-term customer loyalty, and product category differences.

The purpose of this study is to analyze the influence of gamification on impulse shopping behavior, examine the role of age as a moderation variable in shaping user satisfaction and social interaction, and evaluate the impact of gamification on increasing consumer engagement and sales through Shopee Live. The results of the research are expected to provide practical benefits for e-commerce platforms, business actors, digital technology developers, and user experience designers in designing more effective gamification strategies, as well as providing academic contributions as a reference for further research in the field of digital marketing, consumer behavior, and digital economy, as well as increasing consumer awareness to be wiser in dealing with gamification-based marketing strategies when shopping online.

## **METHOD**

This study was designed to explore the influence of gamification elements on impulse purchase behavior on the Shopee Live platform, using the Stimulus-Organism-Response (S-O-R) framework as a theoretical foundation. This framework is used to map how stimuli in the form of game features affect the psychological state of the audience to trigger spontaneous purchase actions. The stimulus variables analyzed included four gamification elements, namely rewards, competition, time pressure, and real-time interaction. These four elements are positioned as triggers that affect the emotional and cognitive engagement of users, which are represented through organismal variables in the form of immersion, sense of presence, and active intensity. In addition, this study also integrates demographic factors in the form of age and gender as moderation variables, assuming that groups of digital natives and digital immigrants as well as gender differences have different responses to gamification elements on digital platforms.

### **Hypothesis Development**

The research hypothesis is built on the basis of literature studies and includes relationships between variables in the S-O-R model. Rewards are hypothesized to affect immersion, sense of presence, and active intensity because incentives such as coins and vouchers encourage viewers to continue to focus on watching and feeling a real presence in broadcasts. Competition is hypothesized to have a similar effect because the sense of competition creates a high focus, a lively social atmosphere, and a strong emotional response. Time pressure is hypothesized to trigger immersion and a sense of presence through real-time urgency, as well as increase active intensity through the emergence of FOMO (fear of missing out). Interaction is hypothesized to strengthen the three organismal variables because two-way communication makes the audience feel involved, psychologically present, and experience an increase in affective intensity. In terms of response, immersion, sense of presence, and active intensity are each hypothesized to have a positive effect on impulsive buying behavior, because these conditions reduce rational control and encourage spontaneous purchasing decisions.

### **Research Objects and Subjects**

The object of this research is the gamification element on the Shopee Live platform, while the subjects are active e-commerce users categorized by gender and Gen Z and Millennial age groups. The instruments used include structured questionnaires, Instagram social media, CapCut

software for stimulation video editing, Microsoft Excel for data tabulation, and SmartPLS as a statistical test tool based on PLS-SEM.

### **Data Collection Procedure**

Primary data is collected through an electronic questionnaire on Google Form. Respondents first filled in demographic data including gender, age, domicile, and frequency of use of Shopee Live. Furthermore, respondents were given a stimulus in the form of a five-minute Shopee Live recorded video link featuring gamification features such as live sales, daily coins, and vouchers. After watching, respondents responded to the S-O-R framework-based statement using a five-point Likert scale that measures perceptions of gamification elements, emotional engagement, and impulse buying tendencies.

### **Research Tools and Materials**

This study uses a number of supporting tools. CapCut is used to edit live streaming video clips so that respondents can visually understand where gamification elements are located. Google Form is used as an online questionnaire platform. Microsoft Excel is used to record, organize, and process data. Shopee is used as an object as well as the main source of material through the Shopee Live feature. SmartPLS is used as a statistical analysis tool with the PLS-SEM and Multi-Group Analysis (MGA) methods.

### **Research Stages**

This research was carried out through several systematic stages. The first stage is problem preparation and identification, where researchers observe the gamification phenomenon on Shopee Live and identify research gaps through literature studies. The second stage is a literature study to build theoretical foundations from relevant journals and books regarding gamification, impulse purchases, and demographic variables. The third stage is population and sample identification, by setting the criteria for respondents from the Gen Z and Millennial groups who have experience watching Shopee Live. The fourth stage is the preparation of a Google Form-based questionnaire that includes a demographic section, video stimulation, and structured statements per variable. The fifth stage is a pilot study of a small number of respondents to test the clarity of the instrument before the main data collection is carried out. If there are deficiencies, revisions are made to the variables or instruments.

After the revision, the sixth stage is online data collection through Instagram and WhatsApp. The collected data is then tested for adequacy using G\*Power software; If it is not sufficient, data collection is continued. Sufficient data is then purged of incomplete or invalid responses. The next stage is structural analysis using PLS-SEM on SmartPLS to test the relationship between hypotheses based on R-square values and path coefficients through the bootstrapping process. After that, Bootstrapping Multi-Group Analysis was carried out to evaluate the role of gender and age moderation on the model. The final stage is the interpretation of the results, the preparation of discussions, and the drawing of conclusions and research suggestions.

### **Pilot Study**

The pilot study was conducted prior to the primary data collection by involving a small number of respondents outside the study sample. The aim was to test respondents' understanding

of each variable statement, validate measurement instruments including statement text and live streaming video snippets, and assess whether the planned sample size was adequate to detect the influence of gamification on impulse purchases.

## **RESULTS AND DISCUSSION**

### **Survey Implementation**

The implementation of the survey in this study was carried out online by applying a planned experiment method to obtain objective data. This data collection process took place systematically from February 20 to March 10, 2026 which began with the preparation stage until final verification.

The initial stage began with the dissemination of publication materials where researchers distributed research flyers through the Instagram social media platform, both through the Instagram Stories feature and uploads to online shopping community accounts. The flyer is designed in an informative manner by containing the purpose of the research, specific respondent criteria, namely active Shopee users, and information about providing incentives (rewards) for selected participants as a form of appreciation for their participation.

At the survey procedure stage, prospective participants who scan the QR code or click on the link on the flyer will be directed directly to the questionnaire platform. Before being allowed to fill in the research instrument, participants are required to watch a video clip of the Shopee Live streaming simulation that has been edited using Cap cut software.

After the video stimulation process is completed, the next stage is the filling out of a questionnaire where participants are asked to respond to a series of statements related to their psychological state which includes the variables Reward, Competition, Time Pressure, Interaction, Immersion, Sense of Presence, and Active Intensity, as well as impulsive purchasing behavior tendencies. This filling process is carried out independently by the respondent without any direct intervention from the researcher to ensure the objectivity and confidentiality of the answers given.

As a final stage, data verification is carried out where all incoming responses are monitored periodically through the survey platform backend system. The researcher conducted an initial examination to ensure that each respondent only provided one response to avoid duplication of data, as well as to ensure that all demographic criteria, especially age and gender variables, were met and in accordance with the pre-planned sample target.

### **Data Preparation**

#### **1. Data Description**

Data were drawn from 100 questionnaire responses designed and disseminated by researchers. The questionnaire consists of 14 demographic questions (age, gender, occupation, etc.) and 27 Likert scale questions 1–5 (hereinafter referred to as items) each of which measures a specific dimension.

#### **2. Data Cleaning and Checking**

It was found that 5 respondents stated that they had never watched Shopee live streaming before. Because the study focused on the Shopee Live user experience, the respondents' responses

were considered irrelevant to the purpose of the study. The five responses were not used, leaving 95 respondents.

The columns relevant to the study were only 24 items used in the framework and age and gender as moderators. The other columns are removed, leaving 26 variables to analyze. No missing or empty values were found in the data.

### 3. Coding

Gender is encoded into numerical so that it can be used in the SEM process. Age is also grouped into Digital Natives and Digital Immigrants according to the framework.

**Table 1 Gender and Age Group Codes**

Variable	Category	Remarks
Gender	1	Male
	2	Women
Age Group	1	Gen Z (13-28 years old)
	2	Millennial Gene (> 28 years)

### 4. Descriptive Statistics

The average and standard deviations of each item are checked. No items with extreme or alarming spreads. All averages are in the reasonable range of 3–4, and the standard deviation is above 0.8 so it is quite discriminatory. The complete statistics are shown in table 2.

**Table 2 Mean and Standard Deviation in Variable Constructs**

Dimensions	Mean	Standard Deviation
Rewards	3,82	0,87
Competition	2,74	1,12
Time Pressure	3,32	1,01
Interaction	3,41	1,04
Immersion	2,94	1,06
Sense of Presence	3,16	1,01
Active Intensity	3,31	1,02
Impulsive Buying Behavior	3,39	1,04

Based on the results of descriptive statistical analysis, the Rewards (RE) variable obtained the highest mean value of 3.82 with a standard deviation of 0.96. This high score indicates that respondents perceive reward elements, such as the giving of coins and vouchers on the Shopee Live platform, as very real and attention-grabbing features. This is in line with the findings of Xi and Hamari (2019) who stated that rewards are the most basic gamification element that is effective in increasing users' extrinsic motivation to remain actively involved in a digital platform.

In contrast to other elements, the Competition (CP) variable recorded the lowest average value of 2.73 with a standard deviation of 1.13. This figure shows that respondents tend to feel less of a competitive climate between users when watching Shopee Live. These findings support the argument of Zhang et al. (2021) who explain that not all elements of gamification have equal effectiveness; In the context of online shopping, users often prioritize the functional value of the product or entertainment over the social status gained through a competition.

The Interactivity variable (INA) produced an average value of 3.40 with a standard deviation of 1.05. This score reflects respondents' positive perception of the two-way interaction that occurs between the host and the audience. This dynamic interactivity plays an important role in transforming the shopping atmosphere into a livelier one. As explained by Xu et al. (2020), interactivity in live streaming services is the main key to building strong social bonds, which are ultimately capable of converting passive viewers into active buyers.

In the Time Pressure (TP) variable, an average value of 3.32 with a standard deviation of 1.05 was obtained. These results show that features such as flash sales or vouchers with a limited duration have succeeded in creating a sense of urgency among respondents. According to Sun et al. (2019), time pressure can psychologically accelerate the decision-making process of consumers by limiting the time for information evaluation, thereby triggering more spontaneous and fast shopping behavior.

The Immersion (IM) variable has an average value of 3.19 with a standard deviation of 1.09. This score illustrates that respondents are quite capable of feeling "washed away" or fully focused when interacting on Shopee Live. This phenomenon can be attributed to the Flow Theory of Csikszentmihalyi, where a well-designed gamification experience is able to bring the user into a highly focused psychological state, which is a crucial element for the creation of an entertaining and immersive shopping experience.

The Active Intensity (AI) variable obtained an average value of 3.10 with a standard deviation of 1.02. This shows a fairly stable level of emotional passion or enthusiasm among the respondents when participating in the Shopee Live session. This active emotional intensity, as explained by Zhang et al. (2021), serves as a bridge or mediating variable that connects the various gamification stimuli provided by the platform with the final behavioral response of the consumer.

Finally, the Purchase Impulse (PI) variable shows an average value of 3.26 with a standard deviation of 0.99. This score confirms that respondents are more likely to agree that they made unplanned purchases after being exposed to gamification elements. These results are consistent with the Stimulus-Organism-Response (S-O-R) framework developed by Syastra and Wangdra (2018), where impulse buying is seen as a final behavioral response triggered by the stimulation of an attractively and emotionally designed shopping environment.

### **Data Sufficiency Test**

The data adequacy test is carried out as a first step to ensure that the data collected is eligible for further analysis. In this study, the evaluation was carried out through statistical power calculation using G\*Power software. Referring to the standard set by Suresh and Chandrasekara (2012), the ideal statistical strength value is 80%. Since this test was carried out after the data collection was completed, the researcher applied the Post Hoc Power Analysis method. The parameters used in this calculation include the level of significance, sample size, and effect size (Faul & Erdfelder, 2007).

The significance level used is 0.05. Then, the researcher used the G\*Power Statistic software to calculate the effect size.

## Conceptualization of the Model

The model consists of the construct Stimulus (gamification element perceived by the respondent), Organism (the psychological response of the respondent), and Response (impulse purchase). The stimulus construct is hypothesized to affect the organism construct, then the organism construct is hypothesized to affect impulsive buying behavior. The relationship between constructs can be seen in Figure 1.

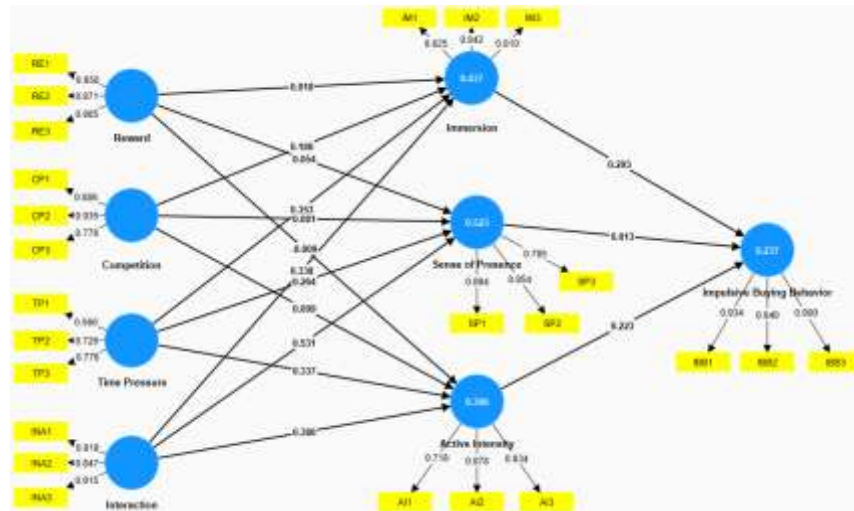


Figure 1

Each dimension of each construct was measured by 3 indicators, namely questionnaire questions filled out by respondents. Dimensions are assumed to be reflective, where these dimensions make up the indicators, not the other way around. For example, the Rewards dimension represents the level of respondents' perception of the existence of rewards in live streaming. If the perception of Rewards is high, then respondents tend to give high scores to all three Rewards indicators. Conversely, if Rewards are low, all of those indicators will also be low. Thus, indicators are the result of dimensions, not dimensional formers. Given this, the following PLS-SEM model was formed on the SmartPLS software.

## Model Evaluation

### 1. Outer Loading

The Outer Loading of an indicator indicates how strongly the indicator (question item) reflects or explains the dimensions it is measuring. According to Hair et al. (2022), an indicator is declared representative and meets the criteria for indicator validity if the loading value is greater than 0.708. The Loading value of each indicator is obtained as follows.

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indicators. Conversely, if Rewards are low, all of those indicators will also be low. Thus, indicators are the result of dimensions, not dimensional formers. Given this, the following PLS-SEM model was formed on the SmartPLS software.

**Tabel 3 Outer Loadings**

Indicator	Loading
AI1 <- Active Intensity	0.719
AI2 <- Active Intensity	0.878
AI3 <- Active Intensity	0.834
CP1 <- Competition	0.886
CP2 <- Competition	0.935
CP3 <- Competition	0.778
IBB1 <- Impulsive Buying Behavior	0.934
IBB2 <- Impulsive Buying Behavior	0.84
IBB3 <- Impulsive Buying Behavior	0.9
IM1 < immersion	0.825
IM2 < immersion	0.842
IM3 < immersion	0.81
INA1 <- Interactivity	0.818
INA2 <- Interactivity	0.847
INA3 <- Interactivity	0.915
RE1 <- Rewards	0.65
RE2 <- Rewards	0.871
RE3 <- Rewards	0.865
SP1 <- Sense of Presence	0.894
SP2 <- Sense of Presence	0.854
SP3 <- Sense of Presence	0.785
TP1 <- Time Pressure	0.56
TP2 <- Time Pressure	0.726
TP3 <- Time Pressure	0.776

Most indicators have good loading, but the RE1 and TP1 indicators are below the ideal limit. However, the Composite Reliability and Average Variance Explained of both still meet the criteria, so the indicators are established.

## 2. Reliability and Dimensional Validity

**Table 4 Reliability and Dimension Variables**

Dimensions	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average Variance Extracted (AVE)
Active Intensity	0,741	0,762	0,853	0,661
Competition	0,835	0,851	0,902	0,754
Immersion	0,769	0,773	0,866	0,682
Impulsive Buying Behavior	0,872	0,908	0,921	0,796
Interactivity	0,825	0,841	0,895	0,741
Rewards	0,728	0,792	0,842	0,643

Sense of Presence	0,799	0,803	0,882	0,715
Time Pressure	0,46	0,484	0,732	0,481

The internal consistency evaluation in this study was carried out by reviewing the Composite Reliability (CR) and Cronbach's Alpha values to ensure that the indicators in each dimension support each other in measuring the same concept. In general, CR values above 0.7 are considered good, although values between 0.6 and 0.7 are still acceptable for exploratory studies (Hair et al., 2022). The test results show that all dimensions have reached an ideal CR value above 0.7. Especially for the Time Pressure (TP) dimension, although Cronbach's Alpha value is relatively low (0.46), this dimension is still maintained because its CR value of 0.732 is still above the minimum threshold, considering that Cronbach's Alpha tends to provide a more conservative or low reliability estimate.

Furthermore, the convergent validity test was carried out through the Average Variance Extracted (AVE) value to see the proportion of the indicator's variance that could be explained by its latent dimensions. The standard of validity set is an AVE value above 0.5, which indicates that the latent construct is able to explain more than 50% of the variance of the question items (Hair et al., 2019). Based on the data obtained, the majority of dimensions meet these criteria with a value above 0.5. The only exception is the Time Pressure (TP) dimension which has an AVE value of 0.481. However, the TP dimension is still maintained in this analysis with a note of limitations, the consideration is that the CR value of the dimension still meets the reliability requirements and the AVE value is close to the minimum standard of 0.5.

### 3. Multicollinearities

The multicollinearity test aims to ensure that there is no too high correlation between independent variables (predictors) in the research model. The existence of high multicollinearity can cause path coefficients to be unstable, difficult to interpret, and increase error standards (Hair et al., 2022). In the context of PLS-SEM, collinearity evaluation is carried out both at the indicator level (Outer Model) and between constructs in the structural model (Inner Model).

The measuring tool used to detect multicollinearity is the Variance Inflation Factor (VIF), where Hair et al. (2019) set an ideal value below 3.0 as an indicator of a model that is free of serious collinearity problems. Based on the results of data processing, all VIF values in the outer model and inner model are in the range of 1.0 to 3.3, with the highest value recorded in the CP2 indicator of 3.311 and in the relationship between the dimensions of Sense of Presence and Impulsive Buying Behavior of 2.638. Since all of these values are still well below the critical threshold, it can be concluded that this model is free from multicollinearity problems, making it suitable for hypothesis testing and reliable interpretation results (Hair et al., 2011).

## Model Interpretation

### 1. Explanatory Capabilities of the Model

The model's ability to explain its internal dimensions can be seen through the value of R2.

**Table 5 R2 Values**

Dimensions	R-square
Active Intensity	0.396
Immersion	0.437
Impulsive Buying Behavior	0.237
Sense of Presence	0.523

From these results, it is known that the Competition, Reward, Time Pressure, and Interactivity variables are able to explain around 39.6% of Active Intensity variations, 43.7% Immersion variations, and 52.3% Sense of Presence variations. Meanwhile, the psychological variables Immersion, Active Intensity, and Sense of Presence explained 23.7% of the variation in Impulsive Buying Behavior.

The SEM model has a fairly good ability to explain the psychological condition of the respondents, although the ability to explain impulsive buying behavior is still moderate. This suggests that impulse buying behavior is often influenced by many other factors outside of the research model, such as financial conditions, product preferences, or external promotions.

### 2. The Influence of Gamification Elements on Psychological Conditions (Organisms)

The influence strength of each dimension is assessed based on the Path Coefficient. The higher the coefficient value, the more impact this dimension has on certain psychological conditions compared to other psychological conditions. The p-value indicates the statistical significance of the influence. With a 95% confidence level, a relationship is considered significant if the p-value < 0.05, and the relationship is even more significant if it gets closer to zero.

### 3. Significant Influences: Interactivity and Time Pressure

**Table 6 Influence of Interactivity Dimensions**

Relationship	Coefficient	p-value
Interactivity -> Active Intensity	0.386	0.000
Interactivity -> Immersion	0.338	0.000
Interactivity -> Sense of Presence	0.531	0.000

Interactivity is the most consistent and powerful factor influencing the psychological state (organism) of the user. All three relationships are statistically significant, while the coefficients show the strength of the relationship. Positive relationships show that the higher the level of interaction a user feels while watching a live stream, the more emotional engagement and sense of presence they feel, and the more "swept away" they are when watching, Social interaction is a key element in live sales to make users feel connected to other hosts and viewers.

**Table 7 Influence of Time Pressure Dimension**

Relationship	Coefficient	p-value
Time Pressure -> Active Intensity	0.337	0.001
Time Pressure -> Immersion	0.353	0.000
Time Pressure -> Sense of Presence	0.264	0.003

Although the effect is not as large as Interactivity, Time Pressure also has a significant effect on the user's entire psychological state. The presence of time limits or urgency in promotions, such as flash sales or countdowns, creates pressure that makes the audience more engaged during the live session.

4. Insignificant Influence: Competition and Rewards

**Table 8 Influence of Competition Dimension**

Relationship	Coefficient	p-value
Competition -> Active Intensity	0.099	0.339
Competition -> Immersion	0.186	0.115
Competition -> Sense of Presence	0.081	0.395

**Table 9 Impact of Dimension Rewards**

Relationship	Coefficient	p-value
Rewards -> Active Intensity	-0.009	0.938
Rewards -> Immersion	0.018	0.830
Rewards -> Sense of Presence	0.054	0.524

The Competition and Rewards dimensions do not show a significant effect on any psychological state (however, in comparison, Rewards are less effective than Competition). A sense of competition with other users, as well as incentives such as discounts or prizes are not enough to increase the emotional engagement of live streaming viewers. Maybe users are more focused on product information than competing with other audiences. Promotional techniques among live streamers may also be very common, so they no longer have a strong effect on viewers.

5. The Influence of Psychological Conditions on Impulse Purchases

After knowing the dimensions that affect the user's internal condition, check what internal conditions do affect the tendency to impulse purchase. As before, this is reviewed using the Path Coefficient. The higher the value of the coefficient, the more impact this dimension has on impulse purchases. The p-value indicates the statistical significance of the influence. With a 95% confidence level, a relationship is considered significant if the p-value < 0.05, and the relationship is even more significant if it gets closer to zero.

**Table 10 Effects of Organisms on Response**

Relationship	Coefficient	p-value
Active Intensity -> Impulsive Buying	0.223	0.265
Immersion -> Impulsive Buying	0.293	0.053

Sense of Presence -> Impulsive Buying	0.013	0.932
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Immersion is the only one with an influence that is close to significant. Immersion also has the most influence compared to the dimensions of other organisms. This suggests that the more users are immersed in the experience of watching live streams, the more likely they are to make spontaneous purchases.

On the other hand, Active Intensity has no significant effect. Even if users feel engaged in the broadcast, it doesn't always directly drive a purchase. Similarly with Sense of Presence, the feeling of being present in a streaming environment isn't enough to trigger impulse purchases.

### The Total Influence of Gamification Elements on Impulse Purchases

The analysis of total effects showed that several elements of gamification had a significant effect on impulse purchases, indirectly through psychological mediators.

**Table 11 Indirect Influence of Gamification Elements on Response**

Relationship	Coefficient	p-value
Interactivity -> Impulsive Buying	0.192	0.008
Time Pressure -> Impulsive Buying	0.182	0.005
Competition -> Impulsive Buying	0.078	0.167
Rewards -> Impulsive Buying	0.004	0.931

Thus, gamification elements that play the most role in increasing the tendency to impulsive purchases on Shopee Live are elements that increase social interaction and create the urgency of time.

### Influence of Moderation Factors

Gender and age group moderation was tested using PLS Multi-Group Analysis. The difference is considered significant between groups if the p-value < 0.05.

#### 1. Gender Moderation

**Table 12 Differences by Sex**

Relationship	Difference (Gender_1 - Gender 2)	p_value
Active Intensity -> Impulsive Buying	-0.049	0.204
Competition -> Active Intensity	0.208	0.271
Competition -> Immersion	0.214	0.305
Competition -> Sense of Presence	0.015	0.928
Immersion -> Impulsive Buying Behavior	0.505	0.113
Interactivity -> Active Intensity	0.38	0.092
Interactivity -> Immersion	-0.151	0.448
Interactivity -> Sense of Presence	0.073	0.669
Rewards -> Active Intensity	-0.278	0.223
Rewards -> Immersion	-0.006	0.984

Rewards -> Sense of Presence	0.072	0.683
Sense of Presence -> Impulsive Buying Behavior	-0.036	0.865
Time Pressure -> Active Intensity	-0.388	0.041
Time Pressure -> Immersion	0.078	0.636
Time Pressure -> Sense of Presence	0.068	0.715

The only significant difference between males and females is in the relationship between the Time Pressure and Active Intensity dimensions. A negative value of the Difference coefficient indicates that the value of the relationship belongs to men (Gender 1) is lower than that of women (Gender 2). The urgency of time affects women's emotional intensity more than men's. Other relationships did not show significant differences between women and men.

## 2. Age Group Moderation

**Table 13 Differences by Age Group**

Relationship	Difference (Gender 1 - Gender 2)	p value
Active Intensity -> Impulsive Buying	0.471	0.286
Competition -> Active Intensity	-0.101	0.679
Competition -> Immersion	-0.446	0.251
Competition -> Sense of Presence	-0.314	0.455
Immersion -> Impulsive Buying Behavior	0.668	0.107
Interactivity -> Active Intensity	-0.045	0.833
Interactivity -> Immersion	-0.181	0.517
Interactivity -> Sense of Presence	0.095	0.697
Rewards -> Active Intensity	-0.415	0.153
Rewards -> Immersion	0.593	0.093
Rewards -> Sense of Presence	-0.07	0.828
Sense of Presence -> Impulsive Buying Behavior	-1.182	0.051
Time Pressure -> Active Intensity	0.274	0.29
Time Pressure -> Immersion	0.315	0.337
Time Pressure -> Sense of Presence	0.315	0.25

There was no significant difference between Generation Z (13-28 years old) and Generation Millennial (> 29 years old) in all relationships. This means that the influence of gamification elements and psychological involvement on impulse buying is relatively similar between young and old age groups. Shopee Live can apply the same gamification strategy for various age groups.

## Research Implications

### 1. Theoretical Implications

- a. It is a reference or basis for further research on the influence of gamification elements on impulse purchases in online shopping live streaming, especially in e-commerce.

- b. This research provides a theoretical contribution on the role of gender, where it is found that the urgency of time (Time Pressure) has a stronger emotional influence on women than men in the context of online shopping. In addition, the finding that there is no significant difference between Generation Z and Millennials shows a convergence of digital behaviors in responding to interactive features on live streaming platforms
2. Practical Implications
    - a. From this study, the Shopee platform and sellers (hosts) should prioritize features that increase two-way interaction, such as answering live chats or providing personal responses to the audience. This has been shown to be more effective at increasing engagement than simply awarding standard points or rewards.
    - b. Since no significant differences were found between the age groups of Gen Z and Millennials, platform developers and marketers don't need to create a highly contrasting gamification strategy for the two segments on Shopee Live. Strategies that focus on visual and interactive experiences can be universally applied.

### **Research Limitations**

In this study, there are still several limitations, which are as follows:

1. This research only focuses on gamification features on the Shopee Live platform. The results of this study may not be generalized directly to other social commerce or e-commerce platforms (such as TikTok Shop or Lazada) which may have different gamification mechanisms and audience characteristics.
2. This research is limited to certain gamification elements (such as Interactivity, Rewards, Competition, and Time Pressure). There are still other gamification elements or technical features of the platform (such as connection quality, video resolution, or streamer figure popularity) that may also affect impulse purchases but are not covered by this research model.
3. Although the study included age moderation (Gen Z and Millennials) as well as gender, the geographic range or socio-economic background of respondents may still be limited to certain groups. This can affect the generalization of research results on the entire population of e-commerce users in Indonesia, which is very diverse.
4. This study is cross-sectional (taken at a specific point in time). Because impulse buying is often influenced by mood or emotions that are temporary, the results of this study may be different if it was done at different times or situations of the shopping season (e.g. during the 11.11 or 12.12 twin date deals).

### **CONCLUSION**

Based on the results of the research, it can be concluded that the gamification element in Shopee Live does not all have the same influence on impulse shopping behavior. Interactivity and Time Pressure have proven to be the main stimulus that can improve the user's psychological state, especially the feeling of immersion, which ultimately encourages impulse purchases. In contrast, the Competition and Rewards elements did not show a significant influence in the context of this

study. Demographically, age has not been shown to moderate the relationship between gamification and user response, so Generation Z and Millennials show relatively similar response patterns. However, gender factors play an important role, with women showing a higher sensitivity to time pressures than men. These findings confirm that the success of gamification strategies on Shopee Live is more determined by the ability to create engaging real-time interactions and a sense of urgency through time pressure rather than simply giving prizes or competitions. Therefore, the development of live commerce features needs to be focused on improving the quality of interactions, immersive experiences, and effective time pressure management to increase consumer engagement and encourage impulse purchase decisions.

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