

Play to Purchase: Exploring Gamification and Visual Design Impact on Impulse Buying in M-Commerce

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ABSTRACT

The rapid growth of the e-commerce sector has intensified competition among platforms, making the implementation of gamification strategies crucial for maintaining a dominant market position. This research investigates the interplay of gamification elements, visual design, immersion, and impulsive buying behavior in the context of Indonesian e-commerce platforms, given the heightened competition. Utilizing a survey with 348 valid responses, Structural Equation Modeling (SEM) in SmartPLS 4.0 was employed for analysis. The study reveals that gamification elements, particularly tangible rewards, positively influence user immersion, consequently mediating impulsive buying tendencies. This highlights the significant impact of gamification on consumer reactions and overall user experience, emphasizing its value in influencing consumer choices. The findings contribute to existing literature on gamification in e-commerce platforms using the S-O-R theory and provide insights into the link between user immersion and impulsive buying, offering valuable guidance for marketing strategies in this underexplored area.

INTRODUCTION

In recent years, e-commerce has had a phenomenal growth boom. The competition between e-commerce platforms in this sector is getting more intense. As a result, it's crucial for e-commerce to comprehend the components that improve their performance, not just in transaction activity but also their customer relationship management in order to ensure their continued competitiveness and market dominance.

Gamification has become a popular marketing strategy in the e-commerce industry. According to a study by Gartner, in 2022, over 70% of large companies will use gamification techniques to enhance user engagement and work efficiency. Many non-game sectors have adopted gamification methods as a tool to build user relationships, such as education, banking, tourism, and hospitality (Deterding et al., 2011; Robson et al., 2015). The adoption of game elements like points, levels, achievements/badges, and rewards can encourage more active participation and higher interaction (Anagnostopoulou et al., 2018).

Gamification is an approach that incorporates game elements into non-game contexts to motivate and engage users (Deterding et al., 2011). In the e-commerce context, the use of gamification features can enhance customer engagement by providing incentives, challenges, and rewards that encourage active participation. Gamified products not only bring many active users to the e-commerce platform but also create opportunities for users to socially interact through gaming platforms, utilizing shopping coupons they earn by playing games, engaging in public welfare activities, participating in poverty alleviation efforts, and to draw players in (Goethe, 2019). Gamification can boost product conversion rates, increase brand loyalty, and trigger for impulsive buying (Hwang & Choi, 2020; Tarmidi & Gumilang Setiawan, 2022)

Recent studies show a positive correlation between gamification and brand engagement (Apenes Solem, 2016; Hollebeek et al., 2021; Xi & Hamari, 2020), brand love (Tsou & Putra, 2023), brand attitude (Smith, 2020), brand loyalty (Gandasari & Mauritsius, 2023; Hwang & Choi, 2020), and impulse buying (Tarmidi & Gumilang Setiawan, 2022; Thanh et al., 2023). The research on the relationship between gamification and impulse buying is still relatively limited, and a comprehensive explanation regarding the role of reward levels and tangible rewards as potential influencing factors still needs to be improved. Gamification and marketing research, however, is still in its early stages (Raman, 2020). In particular, further study is needed to examine the relationship between brand outcomes and the perceived value of gamification. Therefore, in order to inform the future application of gamification in marketing, it is crucial to identify which elements of perceived value impact brand outcomes. There are still very few studies that investigate impulsive buying as a consumer behavior outcome in the context of gamification.

Many e-commerce platforms, such as Shopee, Tokopedia, Lazada, Blibli, Bukalapak, and others, have adopted gamification in their application systems. E-commerce companies employ game design to enhance consumers' enjoyment while using their applications. One example is the provision of rewards upon completing missions, which motivates consumers to continue completing missions to earn rewards. This motivation eventually gives rise to an immersive feeling in consumers. Immersion refers to its depth level, where consumers feel

fully involved and connected with the e-commerce environment. At this level of depth, consumers feel as if they are genuinely within the e-commerce platform.

While numerous research have examined the relationship between gamification and impulsive buying, but they have primarily focused on general elements and to the best of our knowledge, no research links it to immersion (Smith, 2020; Torres et al., 2022), there is a gap in understanding the specific mechanisms through which these elements contribute to user immersion. Research in this area can provide empirical evidence linking immersion to impulsive e-buying, which is a fundamental goal for businesses seeking sustainable success in the digital realm. Further, existing empirical research often generalizes the impact of gamification across various industries. However, it is crucial to recognize that different industries may experience distinct effects of gamification on user immersion and brand loyalty. Conducting industry-specific studies can offer targeted insights into this relationship.

LITERATURE REVIEW

S-O-R Theory

The S-O-R Model serves as a conceptual framework for understanding how external factors impact an individual's behavior (P. Yang et al., 2019). This model, initially proposed by Mehrabian & Russell (1974), is structured around three primary components: stimuli (S), organism (O), and response (R). As described by Bigne et al. (2020), the model operates by considering an external stimulus encountered by an individual at a specific moment, which, in turn, influences the organism in the form of prior experiences, knowledge, beliefs, attitudes, inclinations, intentions, values, motivations, personality traits, and emotions. Subsequently, this influence leads to a response, such as an approach or avoidance response.

While initially rooted in social psychology research (Shao et al., 2019), the S-O-R Model has found application in the examination of online consumer behavior by previous researchers (Kim et al., 2020). Gatautis et al. (2016) introduced an integrated framework that employs the S-O-R Model to explore how gamification influences online consumer behavior. According to (Gatautis et al., 2016) framework, gamification elements are viewed as stimuli that elicit specific responses from consumers, so do visual design, subsequently leading to particular mental states. Once consumers attain the desired mental state, they are then expected to decide whether to continue their engagement in the gamified activity or discontinue their participation.

The intervention process, which encompasses both cognitive and emotional facets that consumers undergo before arriving at a decision in response to external stimuli, has been identified by Islam et al. (2020) and Naqvi et al. (2021) as a fundamental element within the construct of the "Organism." In turn, this "Organism" concept, encapsulates an individual's cognitive and affective states, serving as an intermediary that connects external stimuli to resulting responses. Our study posits that the incorporation of gamification

elements within e-commerce platforms may wield an influence on how customer's immersion with the platform.

The organism processes stimuli, generating a response in the form of consumer behavior (Islam et al., 2020; Mostafa & Kasamani, 2020; H. Zhang et al., 2019). There are three primary categories of consumer behaviors in e-commerce, namely, purchase intention, unplanned purchase intention, and the intention to return (Koufaris, 2002). This study, however, specifically centers its attention on the aspect of impulsive purchasing. Recent scholarly investigations have embraced the SOR (Stimulus-Organism-Response) model to scrutinize the online behaviors of consumers within the e-commerce domain. These inquiries have delved into facets such as online repurchase intention (Zhu et al., 2020), purchase intention (Liu et al., 2018), and impulsive buying intention (Zhu et al., 2020). These studies have not only affirmed the interconnectedness of the SOR model but have also served to augment the rational foundation of the present study.

Gamification Elements

The incorporation of game elements into non-gaming contexts, a practise commonly referred as gamification, has garnered considerable attention in recent years (Deterding et al., 2011; Hosseini & Haddara, 2020; Robson et al., 2015; Werbach Kevin & Hunter Dan, 2012). According to Deterding et al. (2011), gamification is the introduction of game design aspects into non-game context to increase stimulate engagement and improving experience. Burke Biran (2016) also said that the goal of gamification is to change behaviour, develop skills, and drive innovation among consumers. These researches prove that the role of game elements in gamification are intentionally utilised to elicit specific behaviours and enhance user experiences.

Koivisto & Hamari (2019) proposed, at a comprehensive level, three main elements of gamification, namely capabilities implemented in the system (**affordances**), services that lead to **psychological outcomes**, and then leads to **behavioral outcomes**, the activities and behavior that you want to support and motivated through gamification. Affordance refers to the various elements and mechanisms that make up a game that help to encourage enjoyable experiences within the system. Psychological outcomes refer to psychological experiences such as competence, autonomy, and engagement, as well as enjoyment and engagement. Behavioral outcomes refer to the behaviors and activities supported through the use of a gamification system. When effectively utilised, the incorporation of game elements has demonstrated its ability to transform mundane jobs and activities into fascinating experiences that actively involve and inspire people. As a result, gamification has emerged as a significant area of research with far-reaching implications (Hamari et al., 2014).

Research by Klock et al. (2020) found and summarize numerous game design, often referred to as gamification elements, encompass features such as customization, badges, challenges, levels, competition, leaderboards, quests, points, prizes, feedback, guilds, learning components, collections, social status, engagement with social networks, imbued meaning, consequences, narratives, signposting, choices, unlockable aspects, and the establishment of virtual

economies. This study integrates a number of gamification elements commonly found in e-commerce namely membership level and rewards.

H1: Membership level elements positively influence immersion in e-commerce platforms.

H2: Rewards elements positively influence immersion in e-commerce platforms.

Table 1. Gamification Elements

Name of Elements	Description	Study
Membership Level	System to elevate member ranks based on meeting specified order quantities and expenditure criteria.	(Koivisto & Hamari, 2019; Thanh et al., 2023)
Rewards	Any benefits that the user wins for his/her action	(Hwang & Choi, 2020; Mustikasari, 2022)

Source: Author's own creation (2023)

Visual Design

Visual appeal pertains to the overall look of a product's packaging or label, encompassing aspects like colors, shapes, brand representations, illustrations, typography, and layout, all working together to create a compelling impression for enhanced visual quality (Wirya, 1999). When a product's packaging maintains a simple appearance and arranges its visual elements systematically, it facilitates clear and easily understandable communication, aiding in distinguishing between similar products (Singh, 2021).

The significance of a website's visual characteristics on visitor assessments underscores the imperative for online enterprises to prioritize the aesthetic value of their websites, given its pivotal role in facilitating communication and information exchange (Amanah & Harahap, 2020). Aesthetic allure significantly contributes to fostering a positive impact on website visitors, especially during activities like information retrieval or transactions, thereby enhancing the overall user experience (Lee & Jeong, 2012). This appeal encompasses a spectrum of elements, including image quality, color schemes, animated effects, music, and virtual features (Amanah & Harahap, 2020)

Seo et al., (2012) found that high human brand image appeal led to increased visual attention and purchase intention. Ryu & Ryu, (2021) showed that better product visuals increased arousal and processing fluency, which in turn affected aesthetic appreciation and brand attitudes. Peng et al., (2017) found that visually appealing products influenced consumers' perception of the website, leading to positive attitudes. Finally, Di 2014 highlighted the importance of visual attractiveness in fashion e-commerce, as it affects consumer attention, interest, and engagement. These findings collectively

indicate that visual appeal plays a significant role in influencing immersion in e-commerce platforms.

H3: Visual design positively influence immersion in e-commerce platforms.

Immersion

Immersion can be defined as the state of being deeply engaged, absorbed, and focused in an activity or environment (Brown & Cairns, 2004). In the realm of gaming, immersion is facilitated by the integration of various game elements such as narrative, graphics, audio, and interactivity (Jennett et al., 2008). The immersive experience is enhanced when players are transported into a world that stimulates their senses and emotions, fostering a stronger connection to the game environment. This heightened state of immersion in games has been shown to positively impact the user experience and engagement (Klimmt et al., 2010).

The integration of game elements to enhance immersion plays a pivotal role in influencing brand loyalty. Gamification, a technique employing game elements in non-gaming contexts, aims to enhance user engagement and interaction (Deterding et al., 2011). The inclusion of game-like features within brand-related applications and platforms can significantly impact brand perception and loyalty (L. Zhang et al., 2021). For instance, badges, leaderboards, and rewards are often utilized game elements that, when strategically implemented, can intensify immersion and user engagement (Seaborn & Fels, 2015). As users immerse themselves in these gamified experiences, their affinity and loyalty towards the brand tend to strengthen.

H4: Immersion positively influence impulsive buying in e-commerce platforms.

Impulsive Buying

Impulse buying occurs when consumers feel a sudden, strong desire to purchase a product without deliberate consideration. This impulsive urge can lead to shopping outcomes that differ from the initially planned shopping goals and is frequently used as a proxy for online impulse purchases. Rook (1987) suggests that impulse buying happens when consumers prioritize pleasure over self-control. This means they quickly buy something they desire without much thought because they're caught up in the excitement of getting that particular item, overlooking other choices.

Shahida Nasreen (2021) found that demographics play a big role, followed by the situation and personal factors. Huang & Suo (2021) looked into specific things like our mood, surroundings, marketing, time, what's available, and how we interact - all of which can influence how we buy. They even put individual feelings into this situation group. Lo et al. (2016) found that how a website looks and the deals it offers can really make people more likely to buy on impulse. And Li et al. (2018) discovered that both the quality and quantity of comments online can make people more likely to buy things on impulse.

Research indicates that people's age, income, and gender, particularly females, tend to influence how likely they are to make impulse purchases (Yang & Lu, 2013) Different marketing tricks, such as promotions, ads, store atmosphere, music, and even scents, can nudge consumers into making these

impulsive buys (Huang & Suo, 2021). Additionally, personal traits like emotions, difficulty in controlling impulses, seeking pleasure, and being impulsive play a significant role in these spontaneous buying behaviors.

This study suggests that impulse buying is mainly shaped by two things: personal characteristics and the circumstances during shopping. Personal traits include things like your age, income, and individual behaviors, while the shopping situation involves everything from your mindset, the marketing strategies, the products themselves, the environment, the time, and how you interact in that shopping scenario. In regular online shopping, things like promotions, good website quality, what people say online, and how products are introduced really influence how we make purchases (Xiong, 2020)

In today's online shopping landscape, the main driver of consumer behavior is the impact of technological advances. Within this context, impulsive online purchases are considered part of irrational consumer behavior, as they are motivated more by a desire for prestige than by actual needs.. Positive user experiences, and sensory engagement further foster trust and satisfaction, encouraging impulsive buying as users feel more comfortable and confident in their purchasing decisions within the immersive platform. Understanding these practical dynamics offers valuable insights for designing e-commerce platforms that effectively leverage user immersion to drive impulsive buying.

H5: Immersion is a mediator of the relationships between gamification elements of membership level element and impulsive buying in e-commerce platforms.

H6: Immersion is a mediator of the relationships between gamification elements of rewards element and impulsive buying in e-commerce platforms.

H7: Immersion is a mediator of the relationships between visual design and impulsive buying in e-commerce platforms.

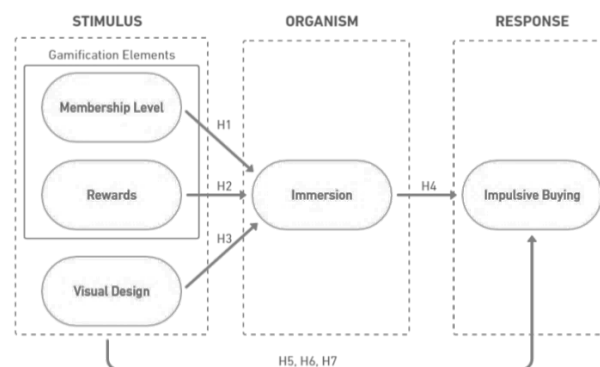


Figure 1. Conceptual Framework

METHODOLOGY

This research uses non-probability sampling method, by conducted an online survey, to collect data. This method selects a person for the research subject, and others are reached through this person (Gupta & Mukherjee, 2022). Hence, we distributed the online survey questionnaire link among individuals within academic circles and social media platforms, including WhatsApp,

Facebook, Instagram, Telegram, and Twitter in Indonesia. Our encouragement aimed to prompt their participation in the survey and further share the survey link with other potential respondents.

Success in the task relies on researcher expertise and ensuring respondents have essential standard traits. The participants were requested to provide information regarding their experience in purchasing in e-commerce platform. In total, 413 participants completed the questionnaire, yet only 348 of these respondents met the criteria for validity.

The measurements used in this study were adapted from previous research and assessed on a five-point likert scale, ranging from "strongly disagree = 1" to "strongly agree = 5". The study included two gamification aspects: membership level element and tangible reward element. Membership level elements were measured using item from Denny (2013). Rewards elements items were adopted from Chang & Yu (2023). Visual design was adopted from a scale from Huang & Suo (2021). Immersion were measured using items from Tsou & Putra (2023). Impulse buying was adopted from items by Li et al. (2022).

The research sample comprises individuals from Indonesia who have previously made repurchases in e-commerce. Purposive sampling emerges as the most fitting strategy for this study, as it allows researchers to collect accurate and reliable data. Researchers can also use this technique to choose respondents who are familiar with e-commerce feature especially gamification.

Based on the data collected, it was observed that of the 348 respondents, 65.23% were female and 34.77% were male. A total of 50.86% of the sample was aged 18–25, 51.15% from Sumatera. 41.38% were college students and 46.26% used Shopee only 2–3 times per month. With 23.56% has income between Rp500.000 - Rp1.500.000, 45,11% can cost < Rp200.000 for online shopping per month (see Table 2).

SmartPLS 4.0 was used to analyze the data. SmartPLS or Smart Partial Least Squares is a statistical software aimed at examining relationships between variables, both among latent variables and with indicator variables (Wang et al., 2023). Smart PLS is highly recommended when dealing with limited sample sizes while constructing a relatively complex model. One of its advantages lies in its user-friendly interface and competitive pricing compared to other software.

RESEARCH RESULT

The constructs' reliability and validity were verified using measures like average variance extracted (AVE), composite reliability (CR) and Cronbach's alpha (α). In order to meet the criteria for acceptance, an AVE threshold of 0.50 is required. The AVE values, falling between 0.60 and 0.81, exceeded this threshold, confirming the reflective nature of the items concerning the constructs. Furthermore, a Cronbach's alpha (α) value of 0.7 or higher signifies a high level of consistency (Fornell & Larcker, 1981; Nunnally, 1994). We determined discriminant validity by comparing the square root of Average Variance Extracted (AVE) values on the diagonal with the correlations between

Table 2. Sample demographics

Variables	Categories	Frequency	%
Gender	Male	121	34,77%
	Female	227	65,23%
Age	< 18	7	2,01%
	18-25	177	50,86%
	26-30	59	16,95%
	31-40	48	13,79%
	41-50	29	8,33%
	> 50	28	8,05%
Domicile	Java	105	30,17%
	Sumatera	178	51,15%
	Bali and Nusa Tenggara	21	6,03%
	Kalimantan	18	5,17%
	Sulawesi	13	3,74%
	Maluku and Papua	13	3,74%
Occupation	Student	7	2,01%
	College Student	144	41,38%
	Government Staff	25	7,18%
	Self-Employed	72	20,69%
	Employee	12	3,45%
	Other	88	25,29%
Using Frequency per Month	< 2 times	157	45,11%
	2-5 times	161	46,26%
	6-10 times	18	5,17%
	> 10 times	12	3,45%
Income per Month	< Rp500.000	71	20,40%
	Rp500.000 - Rp1.500.000	82	23,56%
	Rp1.500.001 - Rp3.000.000	72	20,69%
	Rp3.000.001 - Rp5.000.000	53	15,23%
	Rp5.000.001 - Rp8.000.000	35	10,06%
	Rp8.000.001 - Rp13.000.000	19	5,46%
	> Rp13.000.000	16	4,60%
Online Shopping Cost per Month	< Rp200.000	157	45,11%
	Rp200.000 - Rp500.000	121	34,77%
	Rp500.001 - Rp600.000	26	7,47%
	Rp600.001 - Rp1.000.000	25	7,18%
	> Rp1.000.000	19	5,46%

Source: Field research (2023)

different constructs. The square root of the AVE values for each variable consistently exceeded the interconstruct correlation values, underscoring the presence of discriminant validity within the constructs (see Table 4).

Table 3. Measurement properties

Construct identifier	Items	Outer loadings	Cronbach's alpha	Composite reliability (α)	Composite reliability	Average variance extracted (AVE)	R ²
ML	ML1	0.860	0.889	0.920	0.930	0.817	
	ML2	0.927					
	ML3	0.922					
R	R1	0.717	0.838	0.866	0.883	0.603	
	R2	0.734					
	R3	0.785					
	R4	0.814					
	R5	0.825					
VD	VD1	0.862	0.935	0.959	0.950	0.793	
	VD2	0.912					
	VD3	0.919					
	VD4	0.887					
	VD5	0.871					
IM	I1	0.761	0.901	0.909	0.921	0.626	0.201
	I2	0.813					
	I3	0.774					
	I4	0.731					
	I5	0.792					
	I6	0.850					
	I7	0.814					
IB	IB1	0.907	0.852	0.855	0.911	0.773	0.258
	IB2	0.897					
	IB3	0.832					

Source: Data processed (2023)

Table 4. Correlations

	IB	IM	ML	R	VD
IB					
IM	0.574				
ML	0.426	0.363			
R	0.422	0.473	0.730		
VD	0.171	0.239	0.421	0.549	

Source: Data processed (2023)

Table 5 shows the result of the hypothesis testing. The analysis results for the level of significance of the path model structural path coefficients as presented in Table 5, show that the membership level and visual design have an insignificant effect on immersion. the investigation employed bootstrapping statistics to analyze the mediating effects, as recommended by Zhao et al. (2010), to test for the hypotheses related to the mediating effects among the constructs. Table 5 shows that H6 (reward → immersion → impulsive buying) are supported.

Table 5. Hypothesis testing

Hypothesized relationships	Original sample (O)	T statistics (O/STDEV)	P value	Results
ML -> IM (H1)	0.097	1.574	0.116	Not Supported
R -> IM (H2)	0.371	6.130	0.000	Supported
VD -> IM (H3)	0.019	0.378	0.706	Not Supported
IM -> IB (H4)	0.508	10.651	0.000	Supported
ML -> IM -> IB (H5)	0.049	1.536	0.125	Not Supported
R -> IM -> IB (H6)	0.188	4.984	0.000	Supported
VD -> IM -> IB (H7)	0.010	0.375	0.708	Not Supported

Source: Data processed (2023)

DISCUSSION

The result shows that the use of gamification elements of membership level in e-commerce platforms did not significantly influence immersion. It means that, having different levels to unlock or rules to follow that are hard to understand can be frustrating for customer. If the perks or rewards for reaching these levels aren't exciting or don't feel worth the effort, users might not feel motivated to keep going, and the shopping experience loses its enjoyable feeling. Also, if these membership levels make some users feel left out or if there are technical issues, like things not working as they should, it can make the whole experience less immersive and more frustrating. So, it's important for e-commerce sites to make sure these game-like features are easy to understand, rewarding, and don't cause unnecessary problems for users. It is also in line with the findings that incorporating gamification elements of rewards can have a positive impact on user immersion in e-commerce platform.

The research reveals that the visual design appeal does not significantly influence immersion in e-commerce platforms, and this can be explained by a variety of practical factors. Users exhibit diverse tastes, and what may visually appeal to one user may not resonate with another, contributing to a lack of uniform impact on immersion. Some users prioritize functional aspects and practical needs over aesthetic appeal, particularly when other factors like product variety and pricing take precedence. Additionally, competing design elements or distractions on the platform, limited user engagement with visual elements, and the adaptation of users to the platform's aesthetic can collectively diminish the influence of visual design on the overall immersive experience. These findings highlight the complexity of user preferences and the multifaceted nature of factors shaping the user experience in e-commerce platforms.

CONCLUSIONS AND RECOMMENDATIONS

The exponential growth of e-commerce and intensifying competition underscores the critical role of gamification in enhancing user engagement and fostering immersive experiences, particularly in relation to impulsive buying

behaviors, revealing a substantial yet underexplored avenue for further research and industry-specific investigations.

The study offers practical insights for the e-commerce industry, highlighting the strategic use of gamification elements to enhance user immersion and guide impulsive buying behavior. E-commerce platforms can leverage this understanding by optimizing their gamification strategies, member levels, and visual designs to create a more engaging and enjoyable shopping experience. Notably, the study emphasizes the importance of user-friendly membership systems, suggesting that platforms should simplify rules and enhance rewards to prevent user frustration and maintain a positive immersive environment.

Furthermore, the research underscores the significance of tailored visual designs, recognizing the diversity in user tastes. E-commerce platforms can strike a balance between aesthetic appeal and functional aspects, such as product variety and pricing, to create visually engaging experiences that resonate with different user preferences. These insights contribute to marketing literature, offering guidance on the effective use of gamification to shape consumer behavior and drive impulsive buying. Ultimately, platforms that implement these findings stand to gain a competitive advantage, fostering positive user reactions, increased loyalty, and a stronger market presence. The study advocates for user-centric design principles, urging e-commerce platforms to prioritize simplicity, clarity, and overall user experience for sustained success in the dynamic digital marketplace.

ADVANCED RESEARCH

This study has limitations as it focused solely on the analysis of the two most commonly employed gamification elements to evaluate their impact on consumer behavior. There exist numerous other gamification elements that warrant investigation. Thus, future research endeavors may integrate additional gamification components, such as leaderboards, avatar/customization, and time pressure, to comprehensively assess their influence.

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REFERENCES

- Amanah, D., & Harahap, D. A. (2020). Visual Appeal Model for Consumer Online Impulsive Purchases in Indonesia. *Article in International Journal of Scientific & Technology Research*. www.ijstr.org
- Anagnostopoulou, E., Bothos, E., Magoutas, B., Schrammel, J., & Mentzas, G. (2018). Persuasive technologies for sustainable mobility: State of the art and emerging trends. *Sustainability (Switzerland)*, 10(7). <https://doi.org/10.3390/su10072128>
- Apenes Solem, B. A. (2016). Influences of customer participation and customer brand engagement on brand loyalty. *Journal of Consumer Marketing*, 33(5), 332-342. <https://doi.org/10.1108/JCM-04-2015-1390>
- Bigne, E., Chatzipanagiotou, K., & Ruiz, C. (2020). Pictorial content, sequence of conflicting online reviews and consumer decision-making: The stimulus-organism-response model revisited. *Journal of Business Research*, 115, 403-416. <https://doi.org/10.1016/j.jbusres.2019.11.031>
- Brown, E., & Cairns, P. (2004). *A Grounded Investigation of Game Immersion*.
- Burke Biran. (2016). *Gamify: How Gamification Motivates People to Do Extraordinary Things*. Routledge.
- Chang, S. E., & Yu, C. (2023). Exploring Gamification for Live-Streaming Shopping - Influence of Reward, Competition, Presence and Immersion on Purchase Intention. *IEEE Access*, 11, 57503-57513. <https://doi.org/10.1109/ACCESS.2023.3284033>
- Denny, P. (2013). The Effect of Virtual Achievements on Student Engagement. *CHI 2013: Changing Perspectives, Paris, France*, 3320.
- Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). *From Game Design Elements to Gamefulness: Defining "Gamification."* 341.
- Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18(1), 39-50. <https://doi.org/10.1177/002224378101800104>
- Gandasari, R. A., & Mauritsius, T. (2023). A STUDY ON THE EFFECT OF GAMIFICATION COMPONENTS ON CUSTOMER LOYALTY TOWARD A DIGITAL BANK. *Journal of Theoretical and Applied Information Technology*, 31(6). www.jatit.org
- Gatautis, R., Vitkauskaite, E., Gadeikiene, A., & Piligrimiene, Z. (2016). Gamification as a Mean of Driving Online Consumer Behaviour: SOR

- Model Perspective. *Engineering Economics*, 27(1).
<https://doi.org/10.5755/j01.ee.27.1.13198>
- Goethe, O. (2019). *Immersion in Games and Gamification* (pp. 107–117).
https://doi.org/10.1007/978-3-030-11078-9_10
- Gupta, A. S., & Mukherjee, J. (2022). Long-term changes in consumers' shopping behavior post-pandemic: an exploratory study. *International Journal of Retail & Distribution Management*, 50(12), 1518–1534.
<https://doi.org/10.1108/IJRDM-04-2022-0111>
- Hamari, J., Koivisto, J., & Sarsa, H. (2014). *Does Gamification Work?-A Literature Review of Empirical Studies on Gamification*.
- Hollebeek, L. D., Das, K., & Shukla, Y. (2021). Game on! How gamified loyalty programs boost customer engagement value. *International Journal of Information Management*, 61.
<https://doi.org/10.1016/j.ijinfomgt.2021.102308>
- Hosseini, C., & Haddara, M. (2020). Gamification in Enterprise Systems: A Literature Review. *Advances in Intelligent Systems and Computing*, 1070, 552–562. https://doi.org/10.1007/978-3-030-32523-7_39
- Huang, Y., & Suo, L. (2021). Factors Affecting Chinese Consumers' Impulse Buying Decision of Live Streaming E-Commerce. *Asian Social Science*, 17(5), 16. <https://doi.org/10.5539/ass.v17n5p16>
- Hwang, J., & Choi, L. (2020). Having fun while receiving rewards?: Exploration of gamification in loyalty programs for consumer loyalty. *Journal of Business Research*, 106, 365–376. <https://doi.org/10.1016/j.jbusres.2019.01.031>
- Islam, J. U., Shahid, S., Rasool, A., Rahman, Z., Khan, I., & Rather, R. A. (2020). Impact of website attributes on customer engagement in banking: a solicitation of stimulus-organism-response theory. *International Journal of Bank Marketing*, 38(6), 1279–1303. <https://doi.org/10.1108/IJBM-12-2019-0460>
- Jennett, C., Cox, A. L., Cairns, P., Dhoparee, S., Epps, A., Tijs, T., & Walton, A. (2008). Measuring and defining the experience of immersion in games. *International Journal of Human Computer Studies*, 66(9), 641–661. <https://doi.org/10.1016/j.ijhcs.2008.04.004>
- Kim, M. J., Lee, C.-K., & Jung, T. (2020). Exploring Consumer Behavior in Virtual Reality Tourism Using an Extended Stimulus-Organism-Response Model. *Journal of Travel Research*, 59(1), 69–89. <https://doi.org/10.1177/0047287518818915>

- Klimmt, C., Hefner, D., Vorderer, P., Roth, C., & Blake, C. (2010). Identification with video game characters as automatic shift of self-perceptions. *Media Psychology*, 13(4), 323–338. <https://doi.org/10.1080/15213269.2010.524911>
- Klock, A. C. T., Gasparini, I., Pimenta, M. S., & Hamari, J. (2020). Tailored gamification: A review of literature. *International Journal of Human Computer Studies*, 144. <https://doi.org/10.1016/j.ijhcs.2020.102495>
- Koivisto, J., & Hamari, J. (2019). The rise of motivational information systems: A review of gamification research. In *International Journal of Information Management* (Vol. 45, pp. 191–210). Elsevier Ltd. <https://doi.org/10.1016/j.ijinfomgt.2018.10.013>
- Lee, S. (Ally), & Jeong, M. (2012). Effects of e-servicescape on consumers' flow experiences. *Journal of Hospitality and Tourism Technology*, 3(1), 47–59. <https://doi.org/10.1108/17579881211206534>
- Li, M. ;, Wang, Q. ;, Cao, Y., Foroudi, P., Qi, J., Tchounwou, P. B., Li, M., Wang, Q., & Cao, Y. (2022). Citation: Understanding Consumer Online Impulse Buying in Live Streaming E-Commerce: A Stimulus-Organism-Response Framework. <https://doi.org/10.3390/10.3390/ijerph19074378>
- Li, X. X., Yu, Y. B., & Liu, Z. Z. (2018). Study on the relationship between price promotion and impulse purchase of customers. *Journal of Northeastern University (Social Science Edition)*, 108(2), 33–39.
- Liu, Y., Luo, X., & Cao, Y. (2018). Investigating the influence of online interpersonal interaction on purchase intention based on stimulus-organism-reaction model. *Human-Centric Computing and Information Sciences*, 8(1), 37. <https://doi.org/10.1186/s13673-018-0159-0>
- Lo, L. Y.-S., Lin, S.-W., & Hsu, L.-Y. (2016). Motivation for online impulse buying: A two-factor theory perspective. *International Journal of Information Management*, 36(5), 759–772. <https://doi.org/10.1016/j.ijinfomgt.2016.04.012>
- Mehrabian, A., & Russell, J. A. (1974). *An approach to environmental psychology*. The MIT Press.
- Mostafa, R. B., & Kasamani, T. (2020). Brand experience and brand loyalty: is it a matter of emotions? *Asia Pacific Journal of Marketing and Logistics*, 33(4), 1033–1051. <https://doi.org/10.1108/APJML-11-2019-0669>
- Mustikasari, A. (2022). The Influence of Gamification and Rewards on Customer Loyalty in Z Generation with Moderating Role of Gender (Case

- Study On The Shopee Marketplace). In *Management Analysis Journal*.
<http://maj.unnes.ac.id>
- Naqvi, M. H. A., Jiang, Y., & Naqvi, M. (2021). Generating customer engagement in electronic-brand communities: a stimulus–organism–response perspective. *Asia Pacific Journal of Marketing and Logistics*, 33(7), 1535–1555. <https://doi.org/10.1108/APJML-01-2020-0053>
- Nunnally, J. C. (1994). *Psychometric Theory 3E*. Tata McGraw-Hill Education.
- Peng, X., Peak, D., Prybutok, V., & Xu, C. (2017). The effect of product aesthetics information on website appeal in online shopping. *Nankai Business Review International*, 8(2), 190–209. <https://doi.org/10.1108/NBRI-11-2016-0038>
- Raman, P. (2020). Examining the importance of gamification, social interaction and perceived enjoyment among young female online buyers in India. *Young Consumers*, 22(3), 387–412. <https://doi.org/10.1108/YC-05-2020-1148>
- Robson, K., Plangger, K., Kietzmann, J. H., McCarthy, I., & Pitt, L. (2015). Is it all a game? Understanding the principles of gamification. *Business Horizons*, 58(4), 411–420. <https://doi.org/10.1016/j.bushor.2015.03.006>
- Rook, D. W. (1987). The buying impulse. *Journal of Consumer Research*, 188–199.
- Ryu, S., & Ryu, S. (2021). Feeling excited and fluent: how consumers respond to the visual appeals of products in an online shopping environment. *Behaviour & Information Technology*, 40(11), 1219–1233. <https://doi.org/10.1080/0144929X.2021.1942989>
- Seaborn, K., & Fels, D. I. (2015). Gamification in theory and action: A survey. *International Journal of Human Computer Studies*, 74, 14–31. <https://doi.org/10.1016/j.ijhcs.2014.09.006>
- Seo, Y. W., Chae, S. W., & Lee, K. C. (2012). *The Impact of Human Brand Image Appeal on Visual Attention and Purchase Intentions at an E-commerce Website* (pp. 1–9). https://doi.org/10.1007/978-3-642-28493-9_1
- Shahida Nasreen, M. S. (2021). EFFECT OF SELECTED DEMOGRAPHIC VARIABLES ON TEACHER MOTIVATION IN SECONDARY SCHOOLS OF LAHORE, PAKISTAN. *Pakistan Journal of Educational Research*, 4(4). <https://doi.org/10.52337/pjer.v4i4.359>
- Shao, Z., Zhang, L., Zhang, R., & Pan, Z. (2019). Impact of Gamification on Consumers' Online Impulse Purchase: The Mediating Effect of Affect Reaction and Social Interaction Recommended Citation. *Proceedings of the*

- 23rd Pacific Asia Conference on Information Systems: Secure ICT Platform for the 4th Industrial Revolution, PACIS 2019., 6–15. <https://aisel.aisnet.org/pacis2019>
- Singh, V. (2021). *The impact of brand elements on the purchase behaviour of University of KwaZulu-Natal students in relation to fast-moving consumer goods.*
- Smith, T. A. (2020). The role of customer personality in satisfaction, attitude-to-brand and loyalty in mobile services. *Spanish Journal of Marketing - ESIC*, 24(2), 155–175. <https://doi.org/10.1108/SJME-06-2019-0036>
- Tarmidi, D., & Gumilang Setiawan, D. (2022). *The Effect of Gamification and Price Discounts on Impulsive Buying Decisions Online on the Shopee Indonesia Mobile Application.*
- Thanh, T., Nguyen, T. ;, Binh, T. H., Tu, T. T., Thi, N., & Binh, H. (2023). *Impact of gamification on GenZ consumers' online impulse buying behavior intention: evidence from Shopee application in the Vietnamese market.* <http://hdl.handle.net/10419/279147>
- Torres, P., Augusto, M., & Neves, C. (2022). Value dimensions of gamification and their influence on brand loyalty and word-of-mouth: Relationships and combinations with satisfaction and brand love. *Psychology and Marketing*, 39(1), 59–75. <https://doi.org/10.1002/mar.21573>
- Tsou, H. T., & Putra, M. T. (2023). How gamification elements benefit brand love: the moderating effect of immersion. *Marketing Intelligence and Planning*. <https://doi.org/10.1108/MIP-04-2023-0143>
- Wang, Y., Lou, J., Li, J., Shi, Y., Jiang, T., Tu, L., & Xu, J. (2023). Relationship chains of subhealth physical examination indicators: a cross-sectional study using the PLS-SEM approach. *Scientific Reports*, 13(1), 13640. <https://doi.org/10.1038/s41598-023-39934-5>
- Werbach Kevin, & Hunter Dan. (2012). *For the Win: How Game Thinking Can Revolutionize Your Business* (Vol. 1). Wharton digital press.
- Wirya, I. (1999). *Kemasan yang Menjual*. PT Gramedia Pustaka Utama.
- Xi, N., & Hamari, J. (2020). Does gamification affect brand engagement and equity? A study in online brand communities. *Journal of Business Research*, 109, 449–460. <https://doi.org/10.1016/j.jbusres.2019.11.058>
- Xiong, K. (2020). Research on Influencing Factors of Impulsive Buying in Online Shopping Environment Bases on Perspective of a Payment Method. 2020

- International Conference on E-Commerce and Internet Technology (ECIT)*, 109–112. <https://doi.org/10.1109/ECIT50008.2020.00032>
- Yang, K., & Lu, W. W. (2013). Analysis of consumer impulse purchasing behavior based on network environment. *Journal of Modern Management Science*, 8, 102–104.
- Yang, P., Zhao, Y., Xu, T., & Feng, Y. (2019). The impact of gamification element on purchase intention. *2019 16th International Conference on Service Systems and Service Management (ICSSSM)*, 1–6. <https://doi.org/10.1109/ICSSSM.2019.8887654>
- Zhang, H., Wang, Z., Chen, S., & Guo, C. (2019). Product recommendation in online social networking communities: An empirical study of antecedents and a mediator. *Information & Management*, 56(2), 185–195. <https://doi.org/10.1016/j.im.2018.05.001>
- Zhang, L., Shao, Z., Li, X., & Feng, Y. (2021). Gamification and online impulse buying: The moderating effect of gender and age. *International Journal of Information Management*, 61. <https://doi.org/10.1016/j.ijinfomgt.2020.102267>
- Zhao, X., Lynch, J. G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and Truths about Mediation Analysis. *Journal of Consumer Research*, 37(2), 197–206. <https://doi.org/10.1086/651257>
- Zhu, L., Li, H., Wang, F.-K., He, W., & Tian, Z. (2020). How online reviews affect purchase intention: a new model based on the stimulus-organism-response (S - O - R) framework. *Aslib Journal of Information Management*, 72(4), 463–488. <https://doi.org/10.1108/AJIM-11-2019-0308>