Enhancing User Adoption through Gamification: Investigating the Roles of Ease of Use and Information in Technology Acceptance

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Abstract. This study investigates the influence of gamification and website usability on user intention to continue using an e-commerce platform by involving the role of ease of use. Along with the widespread implementation of gamification as a feature on e-commerce platforms, there are concerns regarding the shift in purchasing decisions from intrinsic motivation to relying on external rewards. This study aims to answer these concerns by examining how gamification and ease of use affect intention to continue using. This study uses a quantitative method with the Partial Least Squares Structural Equation Modeling (PLS-SEM) technique involving 189 active e-commerce users. The results of the study revealed that gamification significantly increased the perception of ease of use and information quality to continue using the e-commerce platform. This study confirms that ease of use and information can strengthen the relationship between gamification and user loyalty which leads to purchasing decisions. This study also responds to criticisms that have emerged against gamification so that it can be a reference for developers in designing sustainable gamification systems.

Keywords: Gamification, Website Usability, E-Commerce Continuance Intentions, Ease of Use.

Introduction

The development of computer technology is something that cannot be separated from human life. One of the consequences of computer development is games. The emergence of games was initially limited to entertainment media and to relieve fatigue. However, there are also many opportunities that are open from the emergence of a game. Games are one of the biggest industries in the world today (Putra *et al.*, 2013). Basically, games are created as entertainment media and make users interested and follow the games in them. However, in its development, the concept of games is not only used in the context of entertainment, but also adapted into various fields. The adoption of a sense of pleasure in playing games for activities outside of entertainment is known as gamification (Seaborn & Fels, 2015).

Gamification is the application of how games work in non-game environments to solve problems involving users (Butgereit, 2015). In principle, elements in games such as points, levels, and leaderboards are then applied in various fields with the aim of making the system mechanism more interesting so that it can increase user retention (Mazarakis & Bräuer, 2023). One field that has implemented this mechanism is business organizations as a marketing strategy. The marketing strategy carried out by business organizations in order to attract consumer interest in shopping is the gamification mechanism on e-commerce platforms (Vallencia *et al.*, 2025).

E-commerce can be defined as the use of the internet to assist the management process of a business organization. The process in question is the activity of transacting goods or services via the web. Currently, some transactions are supported by digital services of e-commerce platforms, which have been developed over the past two decades (Aparicio *et al.*, 2021). The rapid development of e-commerce has an impact on the increasingly tight competition of business organizations. If a business organization

has a unique marketing method, it can attract more users. Therefore, the gamification mechanism on the e-commerce platform is interesting. Currently, many e-commerce platforms use gamification mechanisms and have become an important component for marketing in e-commerce platform design. However, the current design of the gamification mechanism is still less systematic, and does not have a scientific and reasonable design for long-term changes in user behavior (Feng *et al.*, 2019).

Several researchers have analyzed and clarified the relationship between a relatively new topic (gamification) and the main theme that has been recognized in the fields of economics and business organization (e-commerce). Research conducted by Aparicio *et al.* (2021), stated that gamification has a positive impact on platform usage. Different findings were obtained from another study conducted by Kim *et al.* (2020), which stated that gamification has a negative impact on consumer repurchase intentions. Based on the gap in the results of these studies, the topic of gamification on e-commerce platforms was raised in this study. In addition, to provide deeper insight, researchers added other variables, namely ease of use, information quality, and intention to use. To answer this gap, researchers proposed a theoretical model and validated it through PLS-SEM (Partial Least Square-Structure Equation Modeling)

This paper is expected to contribute to the theory by proposing a theoretical model for e-commerce platforms based on gamification mechanisms, usability, and intention to use. In addition, the results of this study are expected to be secondary data for e-commerce business organizations to understand consumer purchasing behavior, especially in marketing strategies that use gamification.

Literature Review

a. Gamification

Gamification is the inclusion of game design elements in a non-game environment. Gamification elements include principles, methods, design, mechanisms, and game frameworks (Deterding *et al.*, 2011). The use of point systems, badges, and leaderboards are the most common ways to implement gamification (Koivisto & Hamari, 2019). Gamification in the scope of e-commerce refers to integrating game design elements into an e-commerce system while maintaining buying and selling functions. The main goal of gamification in e-commerce is to increase meaningful customer engagement and increase purchase intent in customer behavior (Jia & Yu, 2025).

b. Intention to Use

Intention to use a website application (and services) is a key factor for platform providers (Moon & Kim, 2001). Continuation intention refers to the tendency of users to continue using a product or service. This intention is influenced by various factors, such as user satisfaction, perceived benefits, and the overall value proposition of the product or service (Bhattacherjee, 2001).

c. Ease of Use

Ease of use is an individual's perception of how easy a system or technology is to use (Davis, 1989). This ease includes interface navigation, product search, and clarity in the transaction process. In e-commerce studies, ease of use has been shown to be an important determinant in influencing adoption intentions and continued use of a platform (Aparicio *et al.*, 2021). The proper use of gamification can strengthen the perception of ease of use by simplifying the purchasing process and making interactions with the site more intuitive and enjoyable (Rodrigues *et al.*, 2017).

d. Information Quality

Information quality refers to the content contained in the system. The content in question must be clearly visible, provide complete, relevant, easy to understand, and secure information. Information quality can be measured based on accuracy, timeliness, ease of understanding, completeness, relevance, security, and consistency (DeLone & McLean, 2004). In line with this opinion, information quality refers to the extent to which the content provided by an e-commerce platform can help users make the right decisions. This includes accuracy, relevance, clarity, and completeness of information about products and services (Chiu *et al.*, 2014).

Based on the literature review that has been described, the relationship between gamification, ease of use, information quality, and intention to use is the basis for building a conceptual model in this study. Each relationship between variables is explained theoretically and supported by previous empirical findings.

First, an easy-to-use platform will increase users' convenience and efficiency in completing transactions, thereby encouraging them to continue using the platform in the future (Davis, 1989). **H₁** = The perceived ease of use positively influences the intention to use.

Second, gamification is identified as an important determinant in increasing perceived ease of use. In the context of gamified e-commerce, elements such as points, challenges, leaderboards, and rewards can create a more enjoyable and intuitive user experience (Rodrigues *et al.*, 2017). **H₂** = The gamification positively influences the perception of ease of use.

Furthermore, gamification also has the potential to improve user perception of information quality. Interactively designed gamification can help users understand products more easily and efficiently, through visualization, animation, or educational avatars. This is in accordance with the findings of Jia & Yu (2025),, that gamification affordances can enrich the perception of information in the context of e-commerce. **H₃** = The gamification positively influences the information quality.

Gamification is able to create a pleasant experience (perceived enjoyment), increase engagement, and trigger user loyalty (Koivisto & Hamari, 2019). **H₄** = The gamification positively influences the intention to use.

High quality information plays an important role in influencing users' decisions to continue using the platform. Accurate, clear, and relevant information can strengthen users' trust and satisfaction (Chiu *et al.*, 2014). **H₅** = The information quality positively influences the intention to use.

Based on these assumptions, two mediation hypotheses are also proposed to test the indirect mechanism of gamification on intention to use: **H₆** = The perceived ease of use positively mediates the relationship between gamification and intention to use. **H₇** = The platform information positively mediates the relationship between gamification and intention to use.

All of these hypotheses are summarized in a conceptual research model that illustrates the relationship paths between gamification, ease of use, information, and intention to use, both directly and indirectly. Hypothesis testing is conducted using the PLS-SEM approach, which allows for simultaneous analysis of the relationships between these latent variables.

Research Methods

Figure 1. Conceptual Model

Table 1: Variables

Gamification		(Rodrigues *et al.*, 2017)
GAM1	Learning financial literacy during a game on a bank website would be nicer	Deterding *et al.*, 2011a, 2011b; Hsu & Lu, 2004; Moon & Kim, 2001; Walker, 2011.
GAM2	Pleasure in the use of a website with game elements and mechanics	
GAM3	I feel good while playing a game on a bank website.	
GAM4	I would like to participate in this game in an investment bank website	
GAM5	I think a banking website with content and animated elements is secure	
GAM6	The bank websites should reward their customers through a system by points	
Intention to Use		(Rodrigues *et al.*, 2017)

INT1	A bank website with challenges makes me want to use it	Choi & Kim, 2004; Davis, 1989; Moon & Kim, 2001; Wakefield *et al.*, 2011.
INT2	A bank website with animation and rich in interactivity increases my use of a bank website	
INT3	I am more willing to use a bank website if it has a visually appealing and funny web design	
INT4	I will recommend to my friends to use bank websites with game elements and mechanics	
INT5	The website must provide banking products or services with prizes, bonus, or points (and recognize customers with medals or trophies).	
INT6	A bank website should create feelings of pleasure during website use.	
	Ease of Use	(Rodrigues *et al.*, 2017)
EAS1	A bank website must have a good search tool.	Davis, 1989; Moon & Kim, 2001; Wakefield *et al.*, 2011.
EAS2	If the products are well categorized, a bank website facilitate the purchasing process	
EAS3	A bank website should allow quick shopping	
EAS4	A website must have a 'banking' with a simple interface which facilitates the lack of client perception	
	Information	(Rodrigues *et al.*, 2017)
INF1	A bank website should have comparative information between products and prices	Davis *et al.*, 1992; Tan *et al.*, 2009; Walker, 2011; Sam & Tahir, 2009.
INF2	Too much information in a single page of a bank website may confuse the customer.	
INF3	I often have trouble finding the information I need on bank websites.	
INF4	The bank websites must use Avatars or digital animations to facilitate learning.	
INF5	The bank websites must have a good categorization of information.	
INF6	The quality of information from a website helps the intention of customers ' online purchase	

a.   *Measurement Development*

The measurement instrument in this study was compiled based on adaptations from various relevant previous studies such as Davis (1989); Moon & Kim (2001); and Rodrigues *et al.* (2017), which were adjusted to the context of e-commerce in Indonesia. There are four main constructs studied, namely gamification, ease of use, information quality, and intention to use. Each construct is measured using several statement items arranged in the form of a five-point Likert scale, from strongly disagree (1) to strongly agree (5). The gamification construct consists of six indicators that reflect the user's experience of game elements in the e-commerce platform such as animation, prizes, point systems, and satisfaction in use. The ease-of-use construct consists of four items that assess ease of navigation, information search, and intuitive user interface. The information construct includes six items related to the completeness, quality, and clarity of product information displayed on the platform. Meanwhile, the intention to use construct consists of six items that evaluate the user's intention to continue using and recommending the platform.

Construct validity was tested through convergent analysis with the results of outer loading values above 0.7 and Average Variance Extracted (AVE) exceeding 0.5 (Fornell & Larcker, 1981; Hair *et al.*, 2017). In addition, construct reliability has also been confirmed through Composite Reliability (CR) and Cronbach's Alpha values, all of which are above the threshold of 0.7, indicating that the instruments used have met the requirements for good validity and reliability.

b.   *Data Analysis*

Data analysis in this study was conducted using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach through the assistance of SmartPLS software. This technique was chosen because of its ability to handle complex models with latent constructs and moderate sample sizes (Hair *et al.*, 2013). The analysis stages consist of two main parts, namely the evaluation of the

measurement model and the evaluation of the structural model. The evaluation of the measurement model aims to assess the validity and reliability of each construct used. All indicator loading values are above 0.7, AVE above 0.5, and CR and Cronbach's Alpha exceed 0.9, indicating that the instrument has met the convergent and reliability criteria (Hair *et al.*, 2017). Discriminant validity is also confirmed through the Fornell-Larcker and Heterotrait-Monotrait Ratio (HTMT) criteria, where all HTMT values are below 0.90 indicating that each construct distinguishes each other well

Furthermore, the evaluation of the structural model was carried out to test the relationship between constructs based on the path coefficient, t-statistic, and p-value significance, using the bootstrapping method of 5,000 resampling's.

Result and Discussion

This study involved 189 active respondents who were e-commerce users in Indonesia. Based on demographic data, the majority of respondents were female (59.26%), with the largest age group in the range of 20–30 years. Most respondents were students (41.27%) and the dominant users came from the Shopee platform (47.09%). In general, the average value (mean) for all research variables ranged from 3.5 to 4.3 with a standard deviation below 1, indicating that respondents gave a positive assessment of the gamification elements, ease of use, and quality of information on the e-commerce platform they use.

Table 2: Demographic Characteristics of Respondent

Category		Frequency	Percentage (%)
Gender	Female	112	59,26
	Male	77	40,74
Age	20-25	66	34,92
	26-30	65	34,39
	31-35	25	13,23
	<20	15	7,94
	36-40	9	4,76
	>40	9	4,76
Education	Bachelor	72	38,1
	Associate Degree	48	25,4
	High School	41	21,69
	Master	20	10,58
	PhD	8	4,23
Job	Student	78	41,27
	Private Sector Employee	73	38,62
	Entrepreneur	23	12,17
	Public Sector Employee	9	4,76
	Others	6	3,17
Experience in e-commerce (years)	1-2	69	36,51
	3-5	64	33,86
	<1	29	15,34
	>5	27	14,29
Shop frequency	1 time/week	80	42,33
	1-2 times/month	45	23,81
	>1 time/week	43	22,75
	<1 time/month	21	11,11
The e-commerce use	Shopee	89	47,09

	Tokopedia	49	25,93
	Lazada	23	12,17
	Bukalapak	14	7,41
	Tiktok Shop	14	7,41

Before testing the relationships between constructs in the structural model, a collinearity analysis was conducted to ensure that there were no multicollinearity problems among the exogenous constructs that could affect the stability of the path estimates. VIF values exceeding 5 indicate the potential for collinearity which can damage model interpretation (Hair *et al.*, 2014).

The results of the collinearity assessment presented in show that all constructs have VIF values below the threshold, with the highest value being 3.101. This indicates that there are no serious problems related to multicollinearity between predictor variables in the model, so that interpretation of the influence between constructs in the structural analysis stage can be done validly.

Table 3: Collinearity Assessment

	EAS	GAM	INF	INT
EAS				2,843
GAM	1,000		1,000	2,475
INF				3,101
INT				

Notes: EAS=ease of use; GAM=gamification; INF=information; INT=intention to use
Source: Authors' work (2025)

The results of the measurement model evaluation show that all constructs have AVE values between 0.717 and 0.778, with Composite Reliability values between 0.934 and 0.945. The Cronbach's Alpha value is also above 0.90, indicating very good internal consistency. The HTMT value for all pairs of constructs is also below the threshold of 0.90, so it can be concluded that this model has strong discriminant validity.

Table 4: Validity and Reliability for Constructs

Items	Loadings	AVE	CR	Cronbach's alpha
Ease of use		0,778	0,934	0,905
EAS1	0,860			
EAS2	0,893			
EAS3	0,918			
EAS4	0,857			
Gamification		0,717	0,938	0,921
GAM1	0,845			
GAM2	0,883			
GAM3	0,889			
GAM4	0,803			
GAM5	0,817			
GAM6	0,840			
Information		0,727	0,941	0,924
INF1	0,858			
INF2	0,763			
INF3	0,848			
INF4	0,884			
INF5	0,911			
INF6	0,844			
Intention to use		0,740	0,945	0,929
INT1	0,893			
INT2	0,904			
INT3	0,820			
INT4	0,839			

INT5	0,893	
INT6	0,809	

Notes: EAS=ease of use; GAM=gamification; INF=information; INT=intention to use
Source: Authors' work (2025)

Table 5: Fornell-Larcker Criterion (HTMT Criterion)

	EAS	GAM	INF	INT
EAS	0,882			
GAM	0,713 (0,772)	0,847		
INF	0,780 (0,852)	0,741 (0,799)	0,853	
INT	0,762 (0,826)	0,836 (0,889)	0,768 (0,826)	0,860

Notes: EAS=ease of use; GAM=gamification; INF=information; INT=intention to use
Source: Authors' work (2025)

Analysis of the relationship between variables shows that all tested relationship paths directly produce significant coefficients. Ease of use has a positive and significant effect on intention to use (β = 0.237; p = 0.002). Then, Gamification has a significant effect on ease of use (β = 0.713; p < 0.001), information (β = 0.741; p < 0.001), and intention to use (β = 0.522; p < 0.001). Also, information also has a positive and significant effect on intention to use (β = 0.196; p = 0.023). These results are reinforced by mediation analysis, where it was found that gamification indirectly affects intention to use through ease of use (β = 0.166; p = 0.005) and information (β = 0.144; p = 0.032).

Table 6: Effect of endogenous variables (Direct effect)

Hypotheses	β	SE	t-value	p-value	Decision
H1 EAS -> INT	0,237***	0,077	3,088	0,002	Supported
H2 GAM -> EAS	0,713***	0,038	19,013	0,000	Supported
H3 GAM -> INF	0,741***	0,040	18,406	0,000	Supported
H4 GAM -> INT	0,522***	0,074	7,060	0,000	Supported
H5 INF -> INT	0,196**	0,086	2,278	0,023	Supported

Notes: EAS=ease of use; GAM=gamification; INF=information; INT=intention to use
Source: Authors' work (2025)

Table 7: Effect of endogenous variables (Indirect effect)

Hypotheses	β	SE	t-value	p-value	Decision
H6 GAM□EAS□INT	0,166***	0,059	2,797	0.005	Supported
H7 GAM□INF□INT	0,144**	0,067	2,145	0.032	Supported

Notes: EAS=ease of use; GAM=gamification; INF=information; INT=intention to use; ***significant p<0.01 (t>1.96); **significant p<0.05.
Source: Authors' work (2025)

These findings suggest that gamification not only has a direct impact on user intention, but also increases perceptions of ease of use and information quality, which ultimately strengthens user loyalty to the platform.

In terms of the overall model fit evaluation (Goodness-of-Fit), the average AVE value was obtained as 0.741 and the average R^2 was 0.606. The GoF value was calculated using the formula $\sqrt{(AVE \times R^2)}$, resulting in a score of 0.669. Based on the GoF classification proposed by Tenenhaus *et al.*, this value is included in the high category, indicating that the model has a very good fit in explaining the data.

Table 8: Goodness-of-fit Index

Constructs	AVE	R^2
ATU	0,778	0,506
ITU	0,717	

PEOU	0,727	0,547
PU	0,740	0,764
Average scores	0,741	0,606
(GFI=AVE x R2)	0.669	

Notes: EAS=ease of use; GAM=gamification; INF=information; INT=intention to use
Source: Authors' work (2025)

These findings confirm that well-designed gamification not only provides pure fun, but also creates a more user-friendly, informative experience and ultimately increases the intention to continue using the platform.

Conclusion

Based on the results of data analysis using the PLS-SEM approach, it was found that gamification significantly affects ease of use, information quality, and intention to continue using. In addition to direct influence, gamification also has a significant indirect influence on intention to use through the perception of ease of use and the quality of information it improves. This finding confirms that gamification elements do not only function as entertainment mechanisms, but are able to enrich user perceptions of the functions and benefits of a platform as a whole.

Furthermore, these results reinforce previous literature stating that the success of gamification in the context of e-commerce depends on how these elements can drive hedonic and utilitarian values at the same time. Interactive, fun, and useful gamification has been shown to encourage users to remain loyal to the platform they use. Therefore, in the context of digital transformation and increasing competition between e-commerce platforms, gamification strategy is one of the most relevant approaches to increase user engagement and user retention.

Limitation and Further Research

As a note, although this study provides strong theoretical and practical contributions, there are several limitations that need to be considered. This study uses a cross-sectional approach so that it cannot capture the dynamics of changes in user behavior over time. In addition, the sample is limited to e-commerce users in Indonesia, so generalization to the global context needs to be done with caution.

Further research is recommended to use a longitudinal approach and expand the cultural context and type of platform to enrich more universal findings. Further studies can also consider additional psychological variables such as intrinsic motivation, brand attachment, or personalization elements in gamification to reveal deeper mechanisms of influence on user behavior.

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