A Structural Equation Modelling Analysis of Gamification's Impact on Purchase Intention

Seema Varshney[1*], Neelufer Aslam Kulkarni[1], Rodrigo Velasco[1]
[1]Gulf College, Oman

Abstract Gamification has become a prevalent approach for appealing users and encouraging desired behaviours in many fields, comprising marketing, education, banking, healthcare, and numerous other fields. This paper explores in what way integrating gamified elements, such as Points, Badges, Rewards, Challenges, Leaderboards, and Interactive Activities, impacts the online shopping experience for buyers. This study investigates the influence of gamification on the buying intention of the buyers adopting online shopping. It examines the role of perceived ease of use, social interaction, perceived utility and perceived enjoyment in impacting buyers' intention in online buying. The findings of this study intend to provide a valuable insight for e-commerce firms and sellers, aiding them to design and enhance online shopping platforms personalized to the inclinations of consumers. Finally, this study contributes to the wider understanding of consumer behaviour in the digital era and highlights approaches that can enhance the online shopping experience for buyers, nurturing customer engagement, and growth of the business.

Keywords: Gamification, Social interaction, Perceived enjoyment, Behavioral intention, Badges

***Corresponding Author:**
Seema Varshney
seema.varshney@gulfcollege.edu.om

1. Introduction

In the highly dynamic and competitive environment, the concept of gamification is rapidly gaining attention. In fact, the number of gamified applications has recently skyrocketed (Koivisto & Hamari, 2019), and a growing number of scientific studies emerged (Keepers et al., 2022; Kocakoyun & Ozdamli, 2018). The concept of integrating game elements into non-game contexts (Deterding et al., 2011) has been proven effective in various facets of learning (Alsawaier, 2018; Antonaci et al., 2019; Chen & Liang, 2022; Dichev & Dicheva, 2017; Kaya & Ercag, 2023; Khoshnoodifar et al., 2023; Li et al., 2023; Ratinho & Martins, 2023; Sailer & Homner, 2020; Smiderle et al., 2020; Zainuddin et al., 2020), consumer engagement (Doğan-Südaş et al., 2023; García-Jurado et al., 2022; Hamari et al., 2014; Hsu, 2023; Sheetal et al., 2022; Tsou & Putra, 2023) and entertainment (Ozdamli & Milrich, 2023; Sailer et al., 2017; Schiele, 2018). While the majority of empirical evidence showed positive effects of gamification on student academic performance, Sharma et al. (2024) affirm gamification's pervasive influence across business domains, which Aziz et al. (2017) refer to as enterprise gamification.

The application of gamification in business has been proven effective in marketing (Behl et al., 2023; Conaway & Garay, 2014; Hsu & Chen, 2018; Sheetal & Singh, 2022; Stone, 2023; Widjaja et al., 2021), human resource (Murawski, 2021; Pura, 2022; Silic et al., 2020; Vardarlier, 2021) and finance (Bayuk & Altobello, 2019; Nasirzadeh & Fathian, 2020; Raza et al., 2023; Shenol & Onay, 2023). According to Lu and Ho (2020), gamification can incentivize and motivate people, be they employees or customers. Most businesses are now including gamification practises and strategies at a higher pace in non-gaming environments, specifically in marketing. For instance, the retail business enables the penetration of new market segments through the gaming elements (Raman, 2020) because the purchase of goods becomes more enjoyable, appealing, and stimulating (Deterding et al., 2011). The isolated video game elements, not full-fledged games themselves, are strategically harnessed to enhance user experience and engagement within non-game applications and services. This practice represents a significant evolution within the interactive media landscape, warranting deeper academic exploration and analysis (Lamberton & Stephen, 2016).

While empirical studies on gamification are mostly focused on its impact on the marketing of products and brands (i.e., Hsu & Chen, 2018; Lee & Jin, 2019; Milanesi et al., 2023; Tsou & Putra, 2023; Xi & Hamari, 2020), there are only a few studies that measure its effect on buying intention. However, the studies on buying intention mainly discuss the direct effect on consumer online purchase behavior (i.e., Dinh et al., 2023; Doğan-Südaş et al., 2023; Wen et al., 2014; Xu et al., 2020; Yang et al., 2019) without reference to other elements of buying intention including enjoyment and social interaction. According to Zhang et al. (2021), the elements of gamification are positively associated with enjoyment and social interaction, leading to impulsive buying behavior. Hence, this study aims to measure the effect of gamification on enjoyment, social interaction, ease of use, and utility, which induce the buying intention of select online buyers.

2. Theoretical Framework

2.1. Gamification Elements in Marketing

Gamification is an evolving and exciting concept with potential applications in many different areas (Wood & Reiners, 2014; Zichermann & Cunningham, 2011). It is an extensively employed strategy to enhance engagement and motivation in various contexts (Deterding et al., 2011; Hamari et al., 2014). A significant number of companies and marketers are using gamification services to a greater extent based on tremendously negative to extremely positive consumer perceptions (Hamari et al., 2014). However, researchers and marketers alike affirm that the success of gamification depends on several elements that attract consumers online, which Teotónio and Reis (2018) suggest are tailored to the sectors of activity that fit the target audience. For instance, Deterding et al. (2011) identify network design, interaction, badges, objectives or goals, and rewards as necessary integrated elements in the gamified application. In online marketing, game design that induces interaction is more enjoyable to the users (Rodrigues et al., 2019). These refer to the components level of DMC (dynamics, mechanics, and components) framework (Werbach & Hunter, 2012) that includes points and badges. As suggested by Yilmaz et al. (2016), the design must fit the personality of the users.

In this study, gamification is identified by the elements of points and badges embedded in the gamified application. These elements are used to track progress and reward users. Research indicates that these elements can serve as effective motivators, encouraging users to complete tasks and achieve goals (Deterding et al., 2011; Hamari et al., 2014; Trinidad et al., 2021; Vilkaite-Vaitone et al., 2024). Users are often driven by the desire to earn points and badges, which symbolize their achievements within the system. Therefore, these are reliable elements to measure the effectiveness of gamification.

2.2. Effects of Gamification on Online Buyers

According to Huotari and Hamari (2017), the value of game service is a subjective perception of the user. However, research suggests that perceived enjoyment (Yang et al., 2017; Yang et al., 2018), ease of use (Aparicio et al., 2021; Zainuddin, 2023; Yang et al., 2017), perceived utility (Aparicio et al., 2021; Hsu & Chen, 2018; Yang et al., 2017) and social interaction (Dikcius et al., 2021; Tabaeeian et al., 2023) are the common measures which impact buying intention of users.

Perceived enjoyment. Perceived enjoyment is a key element in user engagement with a system where gamification is used. Research studies have shown that users who experience enjoyment and satisfaction are more likely to continue engaging with gamified applications (Hakulinen et al., 2015), leading to their purchase intention (Yang et al., 2017; Yang et al., 2018). Certain components that create emotions enhance enjoyment. Hence, design principles augment perceived enjoyment, such as challenging the users and providing immediate feedback (Hamari et al., 2014). Through the game elements of points or challenges, the users increase their perceived enjoyment. Hence, this study posits that:

H1: Gamification has a positive direct effect on the perceived enjoyment of the consumers.
H2: Perceived enjoyment has a positive effect on the buying intention of the consumers.

Perceived ease of use. Perceived ease of use (PEOU) is an important antecedent that influences buyer's buying intention (Yang et al., 2017). Previous studies indicate that PEOU has a positive impact on the adoption of novel technology, particularly in the online shopping environment (Cho & Sagynov, 2015; Ramayah & Ignatius, 2005). However, Benbasat and Barki (2007) and Li (2014) differ and suggest that PEOU is not a relevant construct in the gamified environment. On the contrary, there are a lot of firms in the marketing domain that, by means of gamification, are taking advantage of and benefit from it (Behl et al., 2020; Karac & Stabauer, 2017). Given these findings, this study argues that:

H3: Gamification has a positive direct effect on perceived ease of use.
H4: Perceived ease of use has a positive direct effect on buying intention.

Perceived utility. Perceived utility (PU) or perceived usefulness refers to the degree to which a person believes that using a particular system would enhance his or her job performance (Fred, 1993). According to Yang et al. (2017), PU positively influences intention to engage with the game, and increased PU positively influences the user's experience (Klaiber & de Kok, 2022). Yang et al. (2017) and Hsu and Chen (2018) found that PU has a significant influence on the user's attitude towards the gamified brand. Given these findings, this study hypothesizes that:

H5: Gamification has a positive direct effect on the perceived utility of users.
H6: Perceived utility has a positive direct effect on buying intention.

Social interaction. Social interaction plays a very important role in determining the decision-making course of online buyers. It involves communication and interaction with other users and potential users, exchanging product reviews, and taking part in social media postings; online retailers can harness the power of word-of-mouth marketing and build trust and loyalty among shoppers (Amiri Aghdaie et al., 2011). Studies suggest that social elements like leaderboards and multiplayer options can inspire collaboration and competitiveness among users, which raises user engagement (Zichermann & Cunningham, 2011). According to Huseynov and Dhahak (2020), interaction with customers is more entertaining and fun, which leads to gaining new customers. Similarly, Tabaeeian et al. (2023) argue that purchase intention is highly influenced by effective advertising characterized by high social interaction among users. Hence, this study posits that:

H7: Gamification has a positive direct effect on the social interaction of the consumers.
H8: Social interaction has a positive direct effect on the buying intention of the users.

Behavioural intention. Behavioural intention refers to users' willingness to perform specific actions or behaviors. According to Hakulinen et al. (2015), gamification positively influences users' behavioral intentions. In this context, users who engage with gamified systems are more likely to express an intention to continue using the platform or perform desired actions (Fiore et al., 2005). Several studies affirmed that gamification highly influences impulsive online shopping behavior (García-Jurado et al., 2021; Lopes et al., 2023; Minh et al., 2023; Tran & Nguyen, 2023; Zang et al., 2021). Given these findings, this study argues that:

H9: Gamification has a positive effect on buying intention.

Based on these propositions, the theoretical model of this study was developed, as shown in Figure 1.

Figure 1
Theoretical Framework
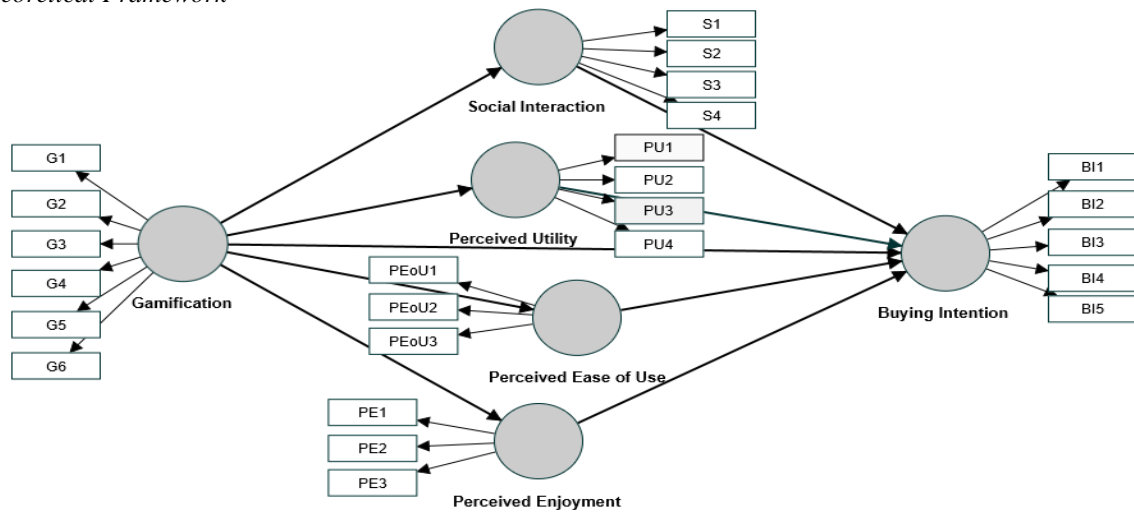
The model highlights the independent, mediating, and dependent research variables. Gamification as the independent variable is characterized by the use of points and badges. Meanwhile, the mediating variables include perceived enjoyment, perceived ease of use, perceived utility, and social interaction. Lastly, behavioural intention is the dependent variable.

3. Methodology

3.1. Participants and Setting

This quantitative study employed a purposive sampling technique in the selection of the participants. It targeted active shoppers with (1) prior online shopping experience and (2) knowledge of gamification, particularly the use of points, badges, and leaderboards. From the 120 surveyed shoppers, the study retrieved 84 completed survey forms with a response rate of 70%. The sample consisted of different types of socio-demographic profiles of respondents based on age, education, and income, as shown in Table 1.

Table 1
Demographic Characteristics of the Respondents

Characteristic	Frequency	Percent
Age		
21-30 years	35	42
31-40 years	12	14.2
41-50 years	6	7.1
51-60 years	24	28.2
above 60 years	7	8.2
Education		
Bachelors	42	50
Postgraduate degree	42	50
Income		
Up to Rs. 20,000 (Up to 250 USD)	6	7.1
Rs. 20,000- 70,000(251- 845 USD)	20	23
Rs. 70,000 -Rs.120,000 (846- 1400 USD)	42	50
Rs. 120,000-170,000 (1401- 2045 USD)	12	14.1
Above Rs. 170,000 (above 2046 USD)	4	4.7

3.2. Instruments

The research employed a three-part survey to collect data. The first part contains the participants' understanding of gamification along with filter questions to ensure their suitability for the study. The

second part collected demographic information from the participants. The core section explored the main constructs using 23 questions distributed into five sections, as shown in Table 2 (Appendix 1).

Table 2
Distribution, Sources and Scaling of the Questionnaire

Measured variable	Number of items	Source	Scaling
Gamification	7	Garcia et al. (2018)	7-point Likert scale
Social Interaction	4	Chao et al. (2009)	7-point Likert scale
Perceived Enjoyment	3	Kim et al. (2007)	7-point Likert scale
Perceived Utility	4	Fred (1989)	7-point Likert scale
Buying Intention	5	Klaiber & de Kok (2022)	7-point Likert scale

3.3. Procedure

The data were collected online using Google Forms, where the form link was sent through different social media platforms. From the 120 responses received, 36 were discarded because of inconsistencies or incomplete information.

Partial Least Squares (PLS) structural equation modeling (SEM) was used to check the validity of the proposed model and test the hypotheses. PLS enables the evaluation of the reliability and validity of the constructs measured in the study, as well as the identification of the hypothesized associations' nature, as emphasized by Barroso et al. (2010).

4. Results

This study evaluated the PLS-SEM model using 500 bootstrap samples, following a two-step process: measurement model and structural model assessment.

4.1. Measurement Model

Table 3 shows the item loadings, internal consistency reliability, and convergent validity. Most of the indicators exceeded the recommended value of 0.70. As recommended by Hair et al. (2017), all the items should have factor loading above 0.7. The items with less than 0.7 factor loading need to be evaluated by checking their reliability and validity. On the other hand, the internal consistency reliability is checked by rhoA, as well as Cronbach's alpha and composite reliability. The values for all constructs were above 0.8, which is said to be good. Therefore, in outer loading, the items with values less than 0.7 are not deleted. In terms of convergent validity, the Average Variance Extracted (AVE) for constructs is more than the minimum threshold of 0.50. As per the results, the values of AVE range from 0.499-0.854 to be acceptable, which is higher than the cut-off of 0.5.

Table 3
Item Loadings, Internal Consistency Reliability, and Convergent Validity

Constructs	Item codes	Outer loadings	rho (r A)	Cronbach's alpha (a)	AVE
	G1	0.926			
	G2	0.349			
	G3	0.452			
Gamification	G4	0.628	0.859	0.838	0.500
	G5	0.558			
	G6	0.679			
	G7	0.718			
	SI1	1.224			
Social interaction	SI2	0.314	1.032	0.889	0.674
	SI3	0.856			
	SI4	0.607			

PU	PU1	0.800			
	PU2	0.911	0.956	0.952	0.830
	PU3	0.984			
	PU4	0.941			
PEOU	PEOU1	0.955			
	PEOU2	0.750	0.928	0.922	0.743
	PEOU3	0.805			
	PEOU4	0.922			
BI	BI1	0.970			
	BI2	0.842			
	BI3	0.967	0.923	0.916	0.854
	BI4	0.927			
	BI5	0.909			
PE	ENJ1				
	ENJ2	0.906	0.916	0.916	0.845
	ENJ3	0.933			

Both the Fornell-Larcker criterion and HTMT ratio confirmed the discriminant validity, as reflected in Table 4.

Table 4
Discriminant Validity-– Fornell-Larcker Criterion

Construct	Buying Intention	Gamification	Perceived Ease of Utility	Perceived Enjoyment	Perceived Utility	Social Interaction
Buying Intention	**0.924**					
Gamification	0.394	**0.640**				
Perceived Ease of Utility	0.689	.451	**.862**			
Perceived Enjoyment	0.864	.263	.749	**.919**		
Perceived Utility	0.888	.331	.689	.811	**.911**	
Social Interaction	-0.028	.509	.143	.045	-0.073	**0.821**

The HTMT criterion measures the average correlations of the indicators, which was found to be less than 0.7, which is a good indicator of the test.

4.2. Structural Model

Table 5 shows that the Variance Inflation Factors (VIF) for all variables were between 5 and 10, indicating no collinearity issues. The R-squared value for the dependent variable, buying intention, was 0.873, indicating strong explanatory power (87%). Other R-squared values were PEOU (0.212), PE (0.077), PU (0.117), and SI (0.250). Overall, the analysis suggests a well-fitting and reliable model with strong measurement properties and good explanatory power for buying intention. However, the R-squared values for other constructs (PEOU, PE, PU) are lower, suggesting room for further investigation or model refinement.

Table 5
Structural Model Result -R Square Test

Construct	R Square	R Square Adjusted
Social Interaction	0.250	0.241
Perceived Utility	0.117	0.106
Perceived Ease of Utility	0.212	0.202
Enjoyment	0.077	0.066
Buying Intention	0.873	0.865

The analysis reveals a strong fit between the model and the observed data, evidenced by a low SRMR value of 0.0679, which is less than the recommended value of 0.08. This indicates minimal discrepancies between the model's predicted relationships and the actual associations present in the data. A model is said to have a good fit when SRMR is less than .08 (Hu & Bentler, 1998, as cited in David, 2016).

Table 6
Blindfolding Test for Predictive Relevance

Construct	SSO	SSE	Q^2 (=1-SSE/SSO)
Social interaction	336.000	292.310	0.130
Perceived utility	336.000	309.441	0.079
Perceived ease of use	336.000	290.261	0.136
Gamification	588.000	588.000	
Enjoyment	168.000	159.764	0.049
Buying intention	420.000	124.370	0.704

Blindfolding tests the predictive relevance of the constructs. Table 6 shows the Q2 values for the endogenous constructs. The Q2 values greater than 0 postulate that the model has adequate predictive relevance (Hair et al., 2016). The Q2 values were in the range of 0.079 and 0.704, suggesting a high predictive relevance (Hair et al., 2017; Jorg et al., 2009).

Table 7
Structural Model Result -F Square Test

Construct	Buying Intention	Enjoyment	Gamification	Perceived Ease of Utility	Perceived Utility	Social Interaction
Social interaction	0.06					
Perceived utility	0.47					
Perceived ease of use	0.02					
Gamification	0.20	0.08		0.27	0.13	0.33
Enjoyment	0.51					
Buying intention						

The f2 effect size was estimated, as shown in Table 7. The PEOU (0.02) and social interaction (0.06) showed a low effect on buying intention, while the rest of the construct's f2 effect size ranged from "medium effect" (gamification=0.205) to high (PU=0.47; PE=0.51).

Table 8
Hypotheses Testing

	Original Sample	Sample Mean	Standard Deviation	T-Statistic	P Value
Social Interaction-> Buying Intention	0.290	0.297	0.154	2.963	0.007
Perceived Utlity->Buying Intention	0.486	0.479	0.099	4.904	0.000
Perceived Ease of Utility-> Buying Intention	-0.004	0.011	0.080	0.048	**0.962**
Gamification->Social Interaction	0.471	0.482	0.099	4.753	0.000
Gamification->Perceived Utility	0.310	0.310	0.178	1.742	**0.082**
Gamification-> Perceived Ease of Use	0.411	0.395	0.148	2.789	0.006
Gamification-> Perceived Enjoyment	0.247	0.240	0.171	1.445	0.000
Gamification-> Buying Intention	0.171	0.177	0.078	2.199	0.028
Perceived Enjoyment->Buying Intention	0.409	0.394	0.082	5.012	0.000

Hypothesis testing was performed based on the 500 bootstrapping PLS-SEM algorithm. From the results shown in Table 8, it can be seen that H1: gamification has a positive direct effect on PE (p value=0.000); H2: PE has a positive effect on BI (p=0.000); H3: gamification has a positive direct

effect on PEOU (p=0.006); H6: PU has a positive direct effect on buying intention (p=0.000), H7: gamification has a positive direct effect on social interaction (p=0.000); H8: social interaction has a positive direct effect on buying intention (p=0.007); H9: gamification has a positive effect on buying intention (p=0.028) are accepted. Meanwhile, H4: perceived ease of use does not have a positive effect on buying intention (p=0.962), and H5: gamification does not have a positive direct effect on PU (p value=0.082).

5. Discussion

Empirical studies suggest that gamification has a positive influence on consumer online purchase behavior, and the elements of gamification are positively associated with enjoyment and social interaction, leading to impulsive buying behavior. However, there are other elements of gamification that have not been completely measured in previous studies. Hence, this study tested the effects of gamification on enjoyment, social interaction, ease of use, and utility, which induce the buying intention of select online buyers. The data were gathered from 84 online shoppers using a 7-point Likert scale survey questionnaire adapted from five studies. Using Partial Least Squares (PLS) structural equation modeling (SEM), this quantitative study checked the validity of the proposed model and tested nine hypotheses.

The findings of this study confirm gamification's positive impact on online buying intentions, echoing Petkov et al. (2011), Yang et al. (2019), Dinh et al. (2023), Xu et al. (2020), Wen et al. (2014) and Doğan-Südaş et al. (2023). Similary, gamification directly and indirectly affects buying intentions, with PEOU and social interaction playing crucial roles. Integrating gamification elements enhances young consumers' enjoyment, and features like social recognition and collaboration positively influence PE and social interaction. Interestingly, only PE, social interaction) and PU significantly impactusers' intention to use gamified websites, not PEOU. This refutes the findings of Yang et al. (2017), Aparicio et al. (2021), and Zainuddin (2023) on the positive association between buying intention and PEOU and affirms Benbasat and Barki (2007) and Li (2014) on the irrelevance of PEOU in the gamified environment. This suggests consumers might continue shopping even without finding any utility because the experience in different gamified activities is enhanced with enjoyment and social interaction. This aligns with Garcia et al. (2019), Koivisto and Hamari (2014), and Muscanell and Guadagno (2012) on the importance of social interaction in gamified contexts. The findings clearly imply that user experience must include interaction with other users. According to Liu and Tanaka (2020), a gamified point system motivates users through social cues. With the integration of challenges, points, rewards, and badges, the users compete and interact with each other, thereby increasing their enjoyment and satisfaction. In the long run, interpersonal competition can lead to instrumental gamification outcomes (Zhang et al., 2023).

The incorporation of strategies like competition, rewards, and social interaction in gamified activities can boost enjoyment and buying intentions. Similarly, features like reviews, ratings, and collaborative activities to create a positive and influential shopping experience can be added. As explained by Tran and Nguyen (2023), GenZ consumers have a high level of intelligent purchases but a high propensity for impulsive buying intentions as well. Hence, gamification must prioritize features that enhance practical benefits over perceived ease of use. They can engage with other buyers using different gamification elements to generate interest, which may influence the buying intention (Varshney et al., 2023). By tailoring online shopping experiences to these factors, retailers can effectively engage online buyers' leading to increased loyalty and revenue. Since gamification has very few important elements like points, badges, and leaderboards, which form a construct, these can easily be applied to many other domains.

The findings of the study provide valuable insight for e-commerce firms and small online businesses, ministering them to design and enhance online shopping platforms personalized to the penchants of consumers. Since there are many available open-source software, they must consider incorporating gamification to reach diverse online buyers. As explained by Sinelnikov (2024), the future of e-commerce is characterized by augmented reality and customized loyalty. Therefore, the value of gamification is imperative nowadays. By incorporating fun and enjoyment into the online shopping

experience, gamification also increases the engagement of the users, thereby developing loyalty in the long run.

This study is limited only to the users with online shopping experience. Since physical stores now offer different gamified activities, the influence of gamification can be measured in both online and on-site shoppers. The study is also limited to the mediating effect of four variables on buying intention. Other mediating variables, including gamification features, user experience, and performance expectations, can be considered for further studies. Similarly, future research may also consider the moderating effects of these variables on buying intention in a gamified environment.

Disclosure Statement

The authors claim no conflict of interest.

Funding

References

Alsawaier, R. S. (2018). The effect of gamification on motivation and engagement. *International Journal of Information and Learning Technology*, *35*(1), 56-79. https://doi.org/10.1108/IJILT-02-2017-0009

Amiri Aghdaie, S. F., Fathi, S., & Piraman, A. (2011). An analysis of factors affecting the consumer's attitude of trust and their impact on internet purchasing behavior. *International Journal of Business and Social Science*, *2*, 147–158.

Antonaci, A., Klemke, R., & Specht, M. (2019). The effects of gamification in online learning environments: A systematic literature review. *Informatics*, *6*(3), 32. https://doi.org/10.3390/informatics6030032

Aparicio, M., Costa, C. J., & Moises, R. (2021). Gamification and reputation: Key determinants of e-commerce usage and repurchase intention. *Heliyon*, *7*(3), e06383. https://doi.org/10.1016/j.heliyon.2021.e06383

Aziz, A., Mushtaq, & Anwar, M. (2017). Usage of gamification in enterprise: A review. In M. Najam ul Islam (Ed.), *2017 International Conference on Communication, Computing and Digital Systems* (pp. 249-252). IEEE. https://doi.org/10.1109/C-CODE.2017.7918937

Barroso, C., Cepeda-Carrion, G., & Roldán, J. (2010). Applying maximum likelihood and PLS on different sample sizes: Studies on SERVQUAL model and employee behavior model. In H. Wang, J. Henseler, V. E. Vinzi, & W. W. Chin (Eds.), *Handbook of partial least squares* (pp. 427-448). Springer. https://doi.org/10.1007/978-3-540-32827-8_20

Bayuk, J., & Altobello, S. A. (2019). Can gamification improve financial behavior? The moderating role of app expertise. *International Journal of Bank Marketing*, *37*(4), 951-975. https://doi.org/10.1108/IJBM-04-2018-0086

Behl, A., Pereira, V., Jayawardena, N., Nigam, A., & Mangla, S. (2023). Gamification as an innovation: A tool to improve organizational marketing performance and sustainability of international firms. *International Marketing Review*, *41*(1), 107-137. https://doi.org/10.1108/IMR-05-2022-0113

Benbasat, I., & Barki, H. (2007). Quo vadis TAM? *Journal of the Association for Information Systems*, *8*(4), 211-218. https://doi.org/10.17705/1jais.00126

Chen, J., & Liang, M. (2022). Play hard, study hard? The influence of gamification on students' study engagement. *Frontiers in Psychology*, *13*, 994700. https://doi.org/10.3389/fpsyg.2022.994700

Conaway, R., & Garay, M. C. (2014). Gamification and service marketing. *SpringerPlus*, *3*, 653. https://doi.org/10.1186/2193-1801-3-653

David, G. G. (2016). *Partial least squares: Regression and structural equation model*. G. David Garson and Statistical Associates Publishing.

Deterding, S., Dixon, D., Rilla, K., & Lennart, N. (2011). From game design elements to gamefulness: Defining gamification. In A. Lugmayr (Ed.), *Proceedings of the 15th International Academic*

MindTrek Conference: Envisioning Future Media Environments (pp. 9–15). Association for Computing Machinery. https://doi.org/10.1145/2181037.2181040

Dichev, C., & Dicheva, D. (2017). Gamifying education: What is known, what is believed and what remains uncertain: A critical review. *International Journal of Educational Technology in Higher Education*, *14*, 9. https://doi.org/10.1186/s41239-017-0042-5

Dinh, T. C. T., Wang, M., & Lee, Y. (2023). How does the fear of missing out moderate the effect of social media influencers on their followers' purchase intention? *SAGE Open*, *13*(3), 215824402311197259. https://doi.org/10.1177/21582440231197259

Dikcius, V., Urbonavicius, S., Adomaviciute, K., Degutis, M., & Zimaitis, I. (2021). Learning marketing online: The role of social interactions and gamification rewards. *Journal of Marketing Education*, *43*(2), 159-173. https://doi.org/10.1177/0273475320968252

Doğan-Südaş, H., Kara, A., & Karaca, E. (2023). Effects of gamified mobile apps on purchase intentions and word-of-mouth engagement: Implications for sustainability behavior. *Sustainability, 15*(13), 10506. https://doi.org/10.3390/su151310506

Fiore, A. M., Jin, H., & Kim, J. (2005). For fun and profit: Hedonic value from image interactivity and responses toward an online store. *Psychology & Marketing*, *22*(8), 669–694. https://doi.org/10.1002/mar.20079

Fred, D. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, *13*(3), 319–340. https://doi.org/10.2307/249008

Fred, D. D. (1993). User acceptance of information technology: System characteristics, user perceptions and behavioral impacts. *International Journal of Man-Machine Studies*, *38*(3), 475–487. https://doi.org/10.1006/imms.1993.1022

Garcia, J. A., Gonzalez, P. C., Jimenez, M., & Rodriguez, A. (2018). Evaluating the role of gamification and flow in e-consumers: Millennials versus generation X. *Kybernetes*, *48*(6), 1278–1300. https://doi.org/10.1108/K-07-2018-0350

García-Jurado, A., Torres-Jiménez, M., Leal-Rodríguez, A. L., & Castro-González, P. (2021). Does gamification engage users in online shopping? *Electronic Commerce Research and Applications*, *48*, 101076. https://doi.org/10.1016/j.elerap.2021.101076

Hair, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: Updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*, *1*(2), 107-123. https://doi.org/10.1504/IJMDA.2017.087624

Hakulinen, C., Elovainio, M., Pulkki-Råback, L., Virtanen, M., Kivimäki, M., & Jokela, M. (2015). Personality and depressive symptoms: individual participant meta-analysis of 10 cohort studies: Research article: Personality and depression. *Depression and Anxiety*, *32*(7), 1-16. https://doi.org/10.1002/da.22376

Hamari, J., Koivisto, J., & Sarsa, H. (2014). Does gamification work? A literature review of empirical studies on gamification. In L. O'Conner (Ed.), *47th Hawaii International Conference on System Sciences* (pp. 3025-3034). IEEE. https://doi.org/10.1109/HICSS.2014.377

Hsu, C. (2023). Enhancing brand love, customer engagement, brand experience, and repurchase intention: Focusing on the role of gamification in mobile apps. *Decision Support Systems*, *174*, 114020. https://doi.org/10.1016/j.dss.2023.114020

Hsu, C., & Chen, M. (2018). How gamification marketing activities motivate desirable consumer behaviors: Focusing on the role of brand love. *Computers in Human Behavior*, *88*, 121-133. https://doi.org/10.1016/j.chb.2018.06.037

Hu, L. T., & Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods*, *3*(4), 424–453. https://doi.org/10.1037/1082-989X.3.4.424

Huotari, K., & Hamari, J. (2017). A definition for gamification: Anchoring gamification in the service marketing literature. *Electron Markets, 27*, 21–31. https://doi.org/10.1007/s12525-015-0212-z

Huseynov, F., & Dhahak, K. (2020). The influence of gamification on online consumers' attitude and intention to purchase fast moving consumer goods. *Business and Economics Research Journal*, *11*(3), 769–791. https://doi.org/10.20409/berj.2020.281

Jorg, H., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. In R. R. Sinkovics & P. N. Ghauri (Eds.), *New challenges to*

international marketing (Advances in international marketing) (Vol. 20, pp. 277-319). Emerald Group Publishing. https://doi.org/10.1108/S1474-7979(2009)0000020014

Karac, J., & Stabauer, M. (2017). Gamification in e-commerce. In F. Fui-Hoon Nah & C. Tan (Eds.), *International Conference on HCI in Business, Government, and Organizations* (pp. 41–54). Springer. https://doi.org/10.1007/978-3-319-58484-3_4

Kaya, O. S., & Ercag, E. (2023). The impact of applying challenge-based gamification program on students' learning outcomes: Academic achievement, motivation and flow. *Education and Information Technologies*, *28*, 10053–10078. https://doi.org/10.1007/s10639-023-11585-z

Keepers, M., Nesbit, I., Romero, D., & Wuest, T. (2022). Current state of research & outlook of gamification for manufacturing. *Journal of Manufacturing Systems*, *64*, 303-315. https://doi.org/10.1016/j.jmsy.2022.07.001

Khoshnoodifar, M., Ashouri, A., & Taheri, M. (2023). Effectiveness of gamification in enhancing learning and attitudes: A study of statistics education for health school students. *Journal of Advances in Medical Education & Professionalism*, *11*(4), 230–239. https://doi.org/10.30476/JAMP.2023.98953.1817

Kim, J., Fiore, A. M., & Lee, H. H. (2007). Influences of online store perception, shopping enjoyment, and shopping involvement on consumer patronage behavior towards an online retailer. *Journal of Retailing and Consumer Services*, *14*(2), 95–107. https://doi.org/10.1016/j.jretconser.2006.05.001

Klaiber, M., & de Kok, M. (2022). *Gamification use intention: Examining the technology acceptance factors that define gamification use intention* [Master's Dissertation, Jönköping University]. Jönköping University Library. https://urn.kb.se/resolve?urn=urn:nbn:se:hj:diva-57828

Kocakoyun, S., Ozdamli, F. (2018). A review of research on gamification approach in education. In R. Morese, S. Palermo, & J. Nervo (Eds.), *Socialization - A multidimensional perspective* (pp. 51-73). InTech. https://doi.org/10.5772/intechopen.74131

Koivisto, J., & Hamari, J. (2019). The rise of motivational information systems: A review of gamification research. *International Journal of Information Management*, *45*, 191-210. https://doi.org/10.1016/j.ijinfomgt.2018.10.013

Lamberton, C., & Stephen, A. T. (2016). A thematic exploration of digital, social media, and mobile marketing: Research evolution from 2000 to 2015 and an agenda for future inquiry. *Journal of Marketing*, *80*(6), 146-172. https://doi.org/10.1509/jm.15.0415

Lee, J., & Jin, D. (2019). The role of gamification in brand app experience: The moderating effects of the 4Rs of app marketing. *Cogent Psychology*, *6*(1), 1-18. https://doi.org/10.1080/23311908.2019.1576388

Li, M., Ma, S., & Shi, Y. (2023). Examining the effectiveness of gamification as a tool promoting teaching and learning in educational settings: A meta-analysis. *Frontiers in Psychology*, *14*, 1253549. https://doi.org/10.3389/fpsyg.2023.1253549

Liu, B., & Tanaka, J. (2020). Integrating gamification and social interaction into an AR-based gamified point system. *Multimodal Technologies and Interaction*, *4*(3), 51. https://doi.org/10.3390/mti4030051

Lopes, J. M., Gomes, S., Lopes, P., Silva, A., Lourenço, D., Esteves, D., Cardoso, M., & Redondo, V. (2023). Exploring the role of gamification in the online shopping experience in retail stores: An exploratory study. *Social Sciences*, *12*(4), 235. https://doi.org/10.3390/socsci12040235

Lu, H. P., & Ho, H. C. (2020). Exploring the impact of gamification on users' engagement for sustainable development: A case study in brand applications. *Sustainability*, *12*(10), 4169. https://doi.org/10.3390/su12104169

Milanesi, M., Guercini, S., & Runfola, A. (2023). Let's play! Gamification as a marketing tool to deliver a digital luxury experience. *Electron Commer Res*, *23*, 2135–2152. https://doi.org/10.1007/s10660-021-09529-1

Minh, D. T., Oanh, L. V., & Quynh, N. D. (2023). How gamification affects online shopping behavior: An approach with youngsters (aged 16 – 30). *Cogent Business & Management*, *10*(3), 1-13. https://doi.org/10.1080/23311975.2023.2256076

Murawski, L. (2021). Gamification in human resource management—Status quo and quo vadis. *German Journal of Human Resource Management*, *35*(3), 337-355. https://doi.org/10.1177/2397002220961796

Nasirzadeh, E., & Fathian, M. (2020). Investigating the effect of gamification elements on bank customers to personalize gamified systems. *International Journal of Human-Computer Studies*, *143*, 102469. https://doi.org/10.1016/j.ijhcs.2020.102469

Ozdamli, F., & Milrich, F. (2023). Positive and negative impacts of gamification on the fitness industry. *European Journal of Investigation in Health, Psychology and Education*, *13*(8), 1411-1422. https://doi.org/10.3390/ejihpe13080103

Petkov, P., Köbler, F., Foth, M., Medland, R., & Krcmar, H. (2011). Engaging energy saving through motivation-specific social comparison. In D. Tan (Ed.), *CHI'11 extended abstracts on human factors in computing systems* (pp. 1945-1950). ACM.

Pura, J. (2022). Linking motivation and employee engagement through gamification in remote working. *International Journal of Academe and Industry Research*, *3*(1), 52-69. https://doi.org/10.53378/352857

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

Ramayah, T., & Ignatius, J. (2005). Impact of perceived usefulness, perceived ease of use and perceived enjoyment on intention to shop online. *Journal of Systems Management*, *3*, 36–51.

Ratinho, E., & Martins, C. (2023). The role of gamified learning strategies in student's motivation in high school and higher education: A systematic review. *Heliyon*, *9*(8), e19033. https://doi.org/10.1016/j.heliyon.2023.e19033

Raza, A., Rehmat, S., Ishaq, M., Haj-Salem, N., & Talpur, Q. (2023). Gamification in financial service apps to enhance customer experience and engagement [Special issue]. *Journal of Consumer Behaviour.* https://doi.org/10.1002/cb.2294

Rodrigues, L. F., Oliveira, A., & Rodrigues, H. (2019). Main gamification concepts: A systematic mapping study. *Heliyon*, *5*(7), e01993. https://doi.org/10.1016/j.heliyon.2019.e01993

Sailer, M., & Homner, L. (2020). The gamification of learning: A meta-analysis. *Educational Psychology Review, 32*, 77–112. https://doi.org/10.1007/s10648-019-09498-w

Sailer, M., Hense, J. U., Mayr, S. K., & Mandl, H. (2017). How gamification motivates: An experimental study of the effects of specific game design elements on psychological need satisfaction. *Computers in Human Behavior*, *69*, 371-380. https://doi.org/10.1016/j.chb.2016.12.033

Schiele, K. (2018). Utilizing gamification to promote sustainable practices. In J. Marques (Ed.), *Handbook of engaged sustainability* (pp. 1-18). Springer. https://doi.org/10.1007/978-3-319-53121-2_16-1

Shenol, D., & Onay, C. (2023). Impact of gamification on mitigating behavioral biases of investors. *Journal of Behavioral and Experimental Finance*, *37*, 100772. https://doi.org/10.1016/j.jbef.2022.100772

Sharma, W., Lim, W. M., Kumar, S., Verma, A., & Kumra, R. (2023). Game on! A state-of-the-art overview of doing business with gamification. *Technological Forecasting and Social Change, 198*, 122988. https://doi.org/10.1016/j.techfore.2023.122988

Sheetal, Tyagi, R., & Singh, G. (2022). Gamification and customer experience in online retail: A qualitative study focusing on ethical perspective. *Asian Journal of Business Ethics*, *12*, 49–69. https://doi.org/10.1007/s13520-022-00162-1

Silic, M., Marzi, G., Caputo, A., & Bal, P. M. (2020). The effects of a gamified human resource management system on job satisfaction and engagement. *Human Resource Management Journal*, *30*(2), 260-277. https://doi.org/10.1111/1748-8583.12272

Sinelnikov, D. (2024, January 17). *The future of e-commerce: Trends to watch in 2024*. Forbes. https://www.forbes.com/sites/forbesagencycouncil/2024/01/17/the-future-of-e-commerce-trends-to-watch-in-2024/?sh=19ef6f4b5e4c

Smiderle, R., Rigo, S. J., & Marques, L. B. (2020). The impact of gamification on students' learning, engagement and behavior based on their personality traits. *Smart Learning Environment*, *7*(3), 1-11. https://doi.org/10.1186/s40561-019-0098-x

Stone, S. (2023). Playing to win: The effects of implementing gamification strategies in product marketing. *CMC Senior Theses*, *3331*, 1-94. https://scholarship.claremont.edu/cmc_theses/3331

Tabaeeian, R. A., Rahgozar, S., Khoshfetrat, A., & Saedpanah, S. (2023). Can gamification affect the advertising effectiveness in social media? *Journal of Communication Management.* Advance online publication. https://doi.org/10.1108/JCOM-03-2023-0034

Teotónio, N., & Reis, J. L. (2018). The gamification systems application elements in the marketing perspective. In Á. Rocha, H. Adeli, L. Reis, & S. Costanzo (Eds.), *Trends and advances in information systems and technologies.* '*Advances in intelligent systems and computing* (Vol. 746, pp. 77-87). Springer. https://doi.org/10.1007/978-3-319-77712-2_8

Tran, T. T., & Nguyen, T. H. B. (2023). Impact of gamification on GenZ consumers' online impulse buying behavior intention: Evidence from Shopee application in the Vietnamese market, In P. N. Chinh (Ed.), *Proceedings of the International Conference on Business Based on Digital Platform* (pp. 321-334). Finance Publishing House.

Trinidad, M., Ruiz, M., & Calderón, A. (2021). A bibliometric analysis of gamification research. *IEEE Access*, *9*, 46505-46544. https://doi.org/10.1109/ACCESS.2021.3063986

Tsou, H. T., & Putra, M. T. (2023). How gamification elements benefit brand love: The moderating effect of immersion. *Marketing Intelligence & Planning*, *41*(7), 1015-1036. https://doi.org/10.1108/MIP-04-2023-0143

Vardarlier, P. (2021). Gamification in human resources management: An agenda suggestion for gamification in HRM. *Research Journal of Business and Management*, *8*(2), 129-139. http://doi.org/10.17261/Pressacademia.2021.1402

Varshney, S., Kulkarni, N., & Haris, S. (2023). Enhancing economic competitiveness of rural women entrepreneurship in Dhofar Region, Oman. In S. Ananda (Ed.), *Enhancing economic competitiveness in the digital era: Innovative models and strategies* (p. 81). College of Banking and Financial Studies.

Vilkaite-Vaitone, N., Kirse, S., Adomaviciute-Sakalauske, K., Dikcius, V., & Zimaitis, I. (2024). The usefulness of gamification for enhancing customer loyalty to small e-tailers. *EuroMed Journal of Business*. Advance Online Publication. https://doi.org/10.1108/EMJB-09-2023-0240

Wen, D. M. H., Chang, D. J. W., Lin, Y. T., Liang, C. W., & Yang, S. Y. (2014). Gamification design for increasing customer purchase intention in a mobile marketing campaign app. In F. F. H. Nah (Ed.), HCI in business. *Lecture notes in computer science* (Vol. 8527, pp. 440–448). Springer. https://doi.org/10.1007/978-3-319-07293-7_43

Werbach, K., & Hunter, D. (2012). *For the win: How game thinking can revolutionize your business*. Wharton Digital Press.

Widjaja, D., Anggiani, S., Kristaung, R., & Jasfar, F. (2021). The effect of gamification, online sales promotion and content-based marketing on impulsive shopping behavior moderated by gender demographic factors. *International Journal of Business and Management Invention*, *10*(11), 32-41.

Wood, L. C., & Reiners, T. (2014). Gamification. In M. Khosrow-Pour (Ed.), *Encyclopedia of information science and technology* (3rd ed., pp. 3039–3047). https://doi.org/10.4018/978-1-4666-5888-2.ch297

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

Xu, Y., Chen, Z., Peng, M. Y. P., & Anser, M. K. (2020). Enhancing consumer online purchase intention through gamification in China: Perspective of cognitive evaluation theory. *Frontiers in Psychology*, *11*, 1-13. https://doi.org/10.3389/fpsyg.2020.581200

Yang, P., Zhao, Y., Xu, T., & Feng, Y. (2019). The impact of gamification element on purchase intention. In Y. Xiao, S. Tong, X. XU, & Y. Mu (Eds.), *16th International Conference on Service Systems and Service Management* (pp. 1-6). IEEE. https://doi.org/10.1109/ICSSSM.2019.8887654

Yang, P. P, Xu, T, Feng, Y. Y, Zhao, Y. T., & Wang, X. J. (2018). The impact of gamification elements on the evaluation of marketing activities. In F. Wijnhoven & M. J. van Sinderen (Eds.)*, Proceedings of the 18th International Conference on Electronic Business* (pp. 634-643). SCITEPRESS.

Yang, Y., Asaad, Y., & Dwivedi, Y. (2017). Examining the impact of gamification on intention of engagement and brand attitude in the marketing context. *Computers in Human Behavior*, *73*, 459–469. https://doi.org/10.1016/j.chb.2017.03.066

Yilmaz, M., Yilmaz, M., O'Connor, R. V., Clarke, P. (2016). A gamification approach to improve the software development process by exploring the personality of software practitioners. In P. Clarke, R. O'Connor, T. Rout, & A. Dorling (Eds.), *Software process improvement and capability determination. Communications in computer and information science* (Vol. 609, pp. 71-83). Springer. https://doi.org/10.1007/978-3-319-38980-6_6

Zainuddin, Z. (2023). Integrating ease of use and affordable gamification-based instruction into a remote learning environment. *Asia Pacific Education Review*. https://doi.org/10.1007/s12564-023-09832-6

Zainuddin, Z., Chu, K., Shujahat, M., & Perera, C. J. (2020). The impact of gamification on learning and instruction: A systematic review of empirical evidence. *Educational Research Review, 30*, 100326. https://doi.org/10.1016/j.edurev.2020.100326

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*, 102267. https://doi.org/10.1016/j.ijinfomgt.2020.102267

Zhang, J., Jiang, Q., Zhang, W., Kang, L., Lowry, P. B., & Zhang, X. (2023). Explaining the outcomes of social gamification: A longitudinal field experiment. *Journal of Management Information Systems*, *40*(2), 401-439. https://doi.org/10.2139/ssrn.4355616

Zichermann, G., & Cunningham, C. (2011). *Gamification by design: Implementing game mechanics in web and mobile apps*. O'Reilly Media.

Appendix 1

The Survey Questionnaire

The following statements ask the respondents to rate their agreement on a 7-point Likert scale from Strongly Agree (7) to Strongly Disagree (1).

	Strongly Agree	Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Disagree	Strongly Disagree
Points/votes are understandable when commenting on products.							
The points/votes correctly reflect the efforts.							
The badges earned reflect the good work.							
The badges are perfectly defined.							
The ranking reflects the status.							
The ranking is well-designed.							
The reputation can be easily checked.							
There are close social relationships in the online shopping community.							
Adequate time is spent interacting with the online shopping community.							
The online shopping community is known on a personal level.							
Frequent interaction exists with the online shopping community.							
Online shopping is enjoyable.							
Online shopping is exciting.							

Online shopping is interesting.

Online shopping is useful for a diversity of products.

Online shopping helps me explore new products.

Online shopping recommends product information.

Online shopping enables one to purchase products faster.

I intend to to shop online in future

I intend to increase online shopping activities in the future.

I intend to recommend online shoppin to others.

I intend to motivate others to shop online.

I intend to continue to shop online.

Demographic Profile

AGE
21-30 years
31-40 years
41-50 years
51-60 years
above 60 years
EDUCATION
Bachelors
Postgraduate degree
INCOME
Up to Rs. 20,000 (Up to 250 USD)
Rs. 20,000- 70,000(251- 845 USD)
Rs. 70,000 -Rs.120,000 (846- 1400 USD)
Rs. 120,000-170,000 (1401- 2045 USD)
Above Rs. 170,000 (above 2046 USD)