



# Gamification in Marketing: Enhancing Participation, Interaction, and Retention in Saudi Telecoms

Neama Elwakeel<sup>1\*</sup>, Amr Noureldin<sup>2</sup>, Mohamed Aboueldahab<sup>3</sup>, Basma Al-Hariry<sup>4</sup>, Atef Fakhfakh<sup>5</sup>

<sup>1</sup>Obour High Institute for Management & Informatics, Department of Business Administration, Cairo, Egypt; and College of Administrative and Human Sciences, Department of Human Resources Management, Buraydah Colleges, Al-Qassim, KSA; n.elwakeel@oi.edu.eg (N.E.).

<sup>2</sup>College of Administrative and Human Sciences, Department of Business Administrations, Buraydah Colleges, Al-Qassim, KSA; and Faculty of Graduate Studies, Sinai University, ElArish, Egypt.

<sup>3</sup>Department of Management Technology and business, Faculty of Management Technology and Information Systems, Portsaid University, Egypt; and College of Administrative and Human Sciences, Department of Human Resources Management, Buraydah Colleges, Al-Qassim, KSA.

<sup>4</sup>Faculty of Commerce, Department of Business Administrations, Port Said University, Egypt. and College of Administrative and Human Sciences, Department of Business Administrations, Buraydah Colleges, Al-Qassim, KSA.

<sup>5</sup>College of Administrative and Human Sciences, Department of Human Resources Management, Buraydah Colleges, Al-Qassim, KSA.

**Abstract.** This study investigates the role of gamification in driving customer engagement, participation, and retention within the Saudi telecommunications sector. Grounded in Uses and Gratifications Theory (U&G), the research explores the direct impact of gamification elements—such as rewards, storytelling, and competition—on brand interaction and how interaction mediates the relationship between gamification and customer outcomes. Using a survey of 378 respondents, the study confirms that gamification significantly enhances brand interaction, which in turn fosters customer participation and retention. The results highlight the importance of interaction as a bridge, amplifying gamification's effects by transforming passive consumers into active participants. Additionally, personalized gamification strategies are shown to strengthen customer loyalty, emphasizing the need for tailored designs to meet diverse user motivations. The findings provide valuable insights for integrating gamification into marketing strategies, particularly in competitive and digitally advanced markets like Saudi Arabia. By leveraging these strategies, companies in the telecommunications sector can enhance customer engagement, foster stronger relationships, and achieve sustainable competitive advantages.

**Keywords:** Brand Interaction, Customer Participation, Customer Retention, Gamification, Saudi Telecoms, Uses and Gratifications Theory.

## 1. INTRODUCTION

Gamification, the integration of game mechanics into non-game contexts, has emerged as a transformative strategy for enhancing customer engagement, participation, and retention in various industries, including telecommunications (Ahmad et al., 2020; Gupta et al., 2024). In marketing, gamification uses elements like rewards, storytelling, and competition to drive interaction and motivate behavior, creating dynamic and enjoyable customer experiences (Lopes et al., 2023). This study explores how gamification fosters customer participation and retention in the Saudi telecommunications sector, a region characterized by high digital adoption and competitive market dynamics. The study focuses on four key variables: gamification, brand interaction, customer participation, and customer retention. Gamification enhances brand interaction by incorporating interactive features that engage users through storytelling and rewards, fostering emotional and cognitive connections (Hamari, 2017). Interaction further drives customer participation, transitioning consumers from passive recipients to active contributors in brand-related activities (Wang et al., 2021). Finally, gamification and interaction contribute to customer retention by building loyalty and reducing the likelihood of churn through meaningful, rewarding experiences (Yang et al., 2022). These relationships highlight the potential of gamification to create a cohesive strategy for sustained customer engagement and loyalty.

This research adopts the Uses and Gratifications Theory (U&G), which posits that individuals actively seek media or platforms to fulfill specific needs such as entertainment, social connection, and information (Malik & Singh, 2024). In the gamification context, U&G helps explain how gamified elements meet intrinsic and extrinsic motivations, enhancing user satisfaction and fostering long-term brand relationships. By leveraging this theory, the study develops a robust framework to analyze the effectiveness of gamification in motivating and retaining customers. Despite the growing adoption of gamification in marketing, its implementation and outcomes in the Saudi telecommunications sector remain underexplored. Companies face challenges in designing gamified systems that resonate with diverse customer segments while maintaining novelty and engagement. Additionally, the mechanisms through which gamification influences participation and retention, such as interaction, are not fully understood. Addressing these gaps is essential for optimizing gamification strategies to meet the unique needs of the Saudi market. To address the research problem, the study aims to answer the following questions:

RQ.1: How does gamification influence brand interaction in the Saudi telecommunications sector?

RQ.2: What is the impact of brand interaction on customer participation and retention?

RQ.3: Does interaction mediate the relationship between gamification and customer outcomes such as participation and retention?

This research aims to assess the direct impact of gamification on brand interaction, examine its influence on customer participation and retention, and analyze how brand interaction influences customer participation and retention. It aims to provide actionable insights for effectively integrating gamification into marketing strategies within the Saudi telecommunications sector. The Saudi telecommunications industry provides a fertile ground for gamification research due to its rapid digital transformation and competitive landscape (Almuqren & Cristea, 2023). Companies like STC, Zain, and Mobily are increasingly adopting innovative digital marketing strategies to attract and retain customers. With high smartphone penetration and tech-savvy consumers, gamification presents a promising approach to enhance engagement and loyalty in this market. By tailoring gamified experiences to the preferences of Saudi customers, telecom companies can gain a competitive edge and foster sustainable growth, this study offers a comprehensive examination of gamification's role in shaping customer participation and retention, with a specific focus on the Saudi telecommunications sector. By bridging theoretical insights with practical applications, the research aims to contribute to the growing field of gamified marketing strategies, providing a roadmap for leveraging gamification to drive customer engagement and loyalty.

## **2. CONCEPTUAL MODEL**

### **2.1. Gamification**

Gamification is the application of game elements and mechanics in non-game contexts to enhance user engagement, motivation, and experience (Ahmad et al., 2020; Berglund et al., 2022). In the marketing field, an application of gaming elements (e.g., rewards, levels, and challenges) to non-gaming contexts to enhance user engagement and motivation (Gupta et al., 2024), businesses are increasingly gamifying their mobile apps and online platforms to enrich customers' digital experiences and drive engagement (Lopes et al., 2023; Merhabi et al., 2021). According to the Gupta et al (2024), the elements of gamification can be described as: Fun: refers to the enjoyment and satisfaction derived from engaging activities. In gamification, fun is achieved by creating playful and interactive experiences that entertain users while encouraging participation and engagement. Reward/Points: is an incentive or benefit offered to participants as recognition for completing tasks or achieving goals in a gamified system. Rewards can include tangible items (like discounts or prizes) or intangible benefits (like points, badges, or status). Competition: involves incorporating elements that encourage users to challenge one another to achieve higher performance or scores. It leverages users' desire for status, recognition, and achievement to increase engagement and participation. Storytelling: integrates narratives or thematic elements to create a compelling and immersive experience. It provides context and emotional connection, making the gamified activity more engaging and memorable.

### **2.2. Customer Participation**

Customer participation refers to the active involvement of consumers in a gamified marketing experience. This includes actions like engaging with tasks, sharing content, providing feedback, or co-creating value within the gamified system. Participation is often motivated by elements such as rewards, competition, or entertainment, fostering a deeper connection with the brand (Gatautis et al., 2021).

### **2.3. Interaction**

Brand interaction in gamification involves consumers engaging directly with a brand through gamified platforms or campaigns. This could include interacting with branded games, social media challenges, or loyalty programs, often facilitated by gaming elements like storytelling and achievements (Syrjälä et al., 2021).

### **2.4. Customer Retention**

Customer retention in KSA telecommunications companies refers to the ability of these companies to keep their existing customers and prevent them from switching to competitors. In the highly competitive Saudi telecom market, which expanded in 2003 by attracting new investors, customer retention has become a critical concern (Almuqren & Cristea, 2023).

## **3. LITERATURE REVIEW, HYPOTHESES, RESEARCH MODEL, AND GAP**

### **3.1. Gamification and Interaction**

Gamification has been widely recognized as an effective strategy for enhancing interaction and engagement across diverse contexts. By integrating elements such as points, badges, leaderboards, rewards, and storytelling, gamification fosters motivation and active participation in educational, marketing, and digital platforms. In educational settings, gamification has been shown to create interactive environments that promote collaboration, immediate feedback, and immersive learning experiences. For instance, in distance education, gamification significantly improved the quality of student interactions with course materials, peers, and instructors, leading to increased satisfaction and learning outcomes (Ferienda et al., 2018; Wulantari et al., 2023). Similarly, in massive open online courses (MOOCs), gamified elements alongside social interactions reduced dropout rates and fulfilled learners' needs for relatedness and recognition, as suggested by social exchange theory (Dikcius et al., 2020). In marketing, gamification has emerged as a key tool for enhancing brand interaction. It motivates users both

extrinsically, through rewards, and intrinsically, by fostering a sense of enjoyment and social connectivity. Studies of online brand communities, such as those of Xiaomi and Huawei, show that gamification elements aligned with achievement and socialization significantly enhance intrinsic motivation, fostering loyalty and repeat engagement (Hamari, 2017; Xi & Hamari, 2019). Gamification has also proven particularly effective in e-commerce, attracting diverse demographic groups by blending entertainment and competitive activities, thereby driving customer engagement (Koivisto & Hamari, 2019; Raman, 2020). Moreover, tailoring gamification designs to different user types—such as Achievers, who are motivated by performance-focused designs, and Socializers, who thrive in socially interactive environments—amplifies its effectiveness. Generic approaches may undermine its impact, emphasizing the need for personalization (Santos et al., 2021). Gamification also addresses challenges in online learning by creating adaptable and engaging activities for synchronous and asynchronous interactions, ultimately promoting meaningful communication and improved performance (Govindarajan, 2020). These findings collectively highlight gamification's capacity to drive meaningful and sustained interactions, leading to the hypothesis:

*Hypothesis 1: Gamification positively influences brand interaction.*

### 3.2. Brand Interaction and Customer Participation

Consumer participation and brand interaction are essential in fostering meaningful relationships between consumers and brands, particularly in digital and social media contexts. Consumer participation enhances brand interaction by transforming consumers from passive recipients to active contributors in the marketing process (Wang et al., 2021). Also, the consumer participation—manifested through consumer-consumer and consumer-brand interactions—strengthens emotional, cognitive, and behavioral engagement with brands. Such engagement is pivotal for driving behaviors like repurchase intentions and active brand advocacy (Cheung et al., 2021). Moreover, gamified brand experiences have emerged as a novel strategy to promote consumer interaction and participation. These experiences leverage entertainment and competition to co-create brand value and foster engagement (Nobre & Ferreira, 2017). These interactions on social media platforms are particularly important for brands, as they positively impact brand involvement and behavioral intentions (Martín-Consuegra et al., 2018). Participation in brand interactions significantly enhances consumer engagement and loyalty. When individuals actively interact with a brand—through social media, events, or feedback—they develop a stronger emotional connection, leading to increased trust and advocacy (Gupta et al., 2024). This underscores the importance of brand interaction as a strategic tool in marketing, particularly in a market like telecommunications KSA, which is characterized by a high degree of digital engagement.

*Hypothesis 2: brand interaction has a positive impact on customer participation*

### 3.3. Brand Interaction and Customer Retention

Brand interaction is a critical element in fostering customer retention, particularly in the context of modern marketing strategies. Through social media, brands engage in dynamic, two-way communication with consumers, enhancing satisfaction and loyalty. These interactions help build brand awareness and a favorable image, encouraging customer loyalty and repeat purchases. Social media's adaptability allows brands to create personalized, user-centric content, which further solidifies the relationship between brands and their customers (Yang et al., 2022). Additionally, technological advancements have enhanced brand interaction through big data analytics, enabling companies to offer tailored experiences. Tools such as sentiment analysis and segmentation empower brands to anticipate customer needs and deliver timely interventions. These data-driven strategies not only increase customer satisfaction but also reduce churn, reinforcing the integral role of technology in sustaining customer retention (Ijomah et al., 2024). However, customer relationship management systems play a pivotal role in facilitating effective brand interaction. Social CRM integrates tools like email and social media to enhance customer communication, providing personalized and efficient services. These interactions promote customer happiness, which mediates the relationship between CRM practices and retention, underscoring the need for consistent, responsive engagement (Alshurideh et al., 2023). In this context, beyond traditional methods, servitization—the blending of products and services—introduces new dimensions of brand interaction. Experiences that are integrated, customized, and relational enhance value co-creation and emotional connections with customers. These strategies strengthen loyalty and retention by fostering a sense of brand resonance, particularly in service-dominant industries (Jang et al., 2020). Overall, consistent and positive brand interactions remain central to effective retention strategies. Grounded in Social Exchange Theory, these interactions foster loyalty by reciprocating customer engagement. However, variability in interactions can undermine trust, emphasizing the need for consistency and long-term relationship-building (Cambra-Fierro et al., 2021). This highlights the multifaceted role of brand interaction in retaining customers and ensuring sustained business success.

*Hypothesis 3: Brand Interaction have a positive impact on customer retention*

### 3.4. Gamification and Customer Retention

The effective gamification strategies lead through personalized experiences and rewards, fostering emotional

connections to improved retention rates as customers feel more valued and invested in their relationship with the brand (Kridiawan and Wang, 2024). Alipay users found that gamified artifactual affordances such as rewards, competition, feedback, and cooperation positively affect user retention through increased user engagement (Zhang et al., 2023). Also, by incorporating game-like elements such as rewards, achievements, and competition into marketing efforts, businesses can create memorable experiences that motivate customers to return and make repeat purchases (Chen, 2023). Additionally, gamification personalizes the customer journey, making it more enjoyable and fulfilling. This emotional connection not only encourages return visits but also strengthens the customer's bond with the brand, as shown in studies on fashion retail where gamification increased repeat engagement and satisfaction (Goldberg, 2024). However, the effectiveness of gamification relies on maintaining novelty and relevance; poorly designed or repetitive systems may lead to disengagement over time.

*Hypothesis 4: Gamification have a positive impact on customer retention.*

### 3.5. Gamification and Consumer Participation

Gamification has emerged as a promising strategy to enhance consumer participation and engagement across various domains. Research indicates that gamification elements can positively influence consumer behavior, particularly in e-commerce and online shopping platforms (Xu et al., 2020). Specifically, rewards and challenges are identified as the most commonly used mechanisms, with points, badges, and leaderboards being the most tested gamification elements (Tobon et al., 2019). These elements are often categorized into achievement-oriented and immersion-related features, with the former being more prevalent in current applications (Rahmadhan et al., 2023). For instance, in loyalty programs, self-oriented rewards were found to have a stronger impact on consumer responses compared to altruistic rewards (Hwang & Choi, 2019). Additionally, in the context of green logistics, consumers may prioritize social factors such as interactivity affordance over competition and achievement affordances (Liu et al., 2024). Interestingly, while gamification shows potential in increasing consumer participation, its effectiveness can vary based on individual preferences and personality types. Studies suggest that tailoring gamification elements to user profiles may lead to more effective outcomes (Hallifax et al., 2019). Additionally, the impact of gamification on consumer behavior is not uniform across all contexts. For instance, in e-participation platforms, despite the availability of gamified systems, public participation remains low (Thiel et al., 2016). gamification presents a promising approach to enhance consumer participation, particularly in digital environments. However, its success depends on careful implementation, considering factors such as user preferences, context, and the specific combination of game elements employed. Accordingly, this study hypothesis that:

*Hypothesis 5: Gamification have a positive impact on consumer participation.*

### 3.6. Mediating Effect of Customer Participation

The role of interaction as a mediating factor in the relationship between gamification and customer-related outcomes has garnered significant attention in the literature. Gamification fosters interactive environments by engaging users through challenges, rewards, and leaderboards, which encourage active participation and collaboration. Interaction is a critical driver that enhances the effects of gamification, transforming passive users into active participants and fostering long-term engagement. For H6a, gamification enhances customer participation by creating engaging opportunities for users to interact with the brand or platform. Studies suggest that features such as real-time feedback, competitive tasks, and social collaboration encourage users to take part actively in activities, thereby strengthening their bond with the brand (Hamari, 2017; Raman, 2020). Increased interaction amplifies the motivational effects of gamification, making participation more meaningful and frequent. For H6b, interaction plays a pivotal role in customer retention by promoting loyalty and sustained engagement. Gamification encourages users to return to platforms by offering progressive rewards, recognition, and a sense of achievement. Enhanced interaction fosters emotional connections with the brand and reinforces customers' intentions to continue their engagement over time (Koivisto & Hamari, 2019; Xi & Hamari, 2019). Consequently, gamification, mediated by interaction, contributes to retaining customers by consistently meeting their intrinsic and extrinsic motivational needs.

*Hypothesis 6: Interaction mediate the relationship between gamification and (H6a) customer participation (H6b) customer retention*

### 3.7. Research Model

This study's model examines the direct and indirect effects of gamification on customer participation and retention, with interaction as a mediating variable. Grounded in Uses and Gratifications Theory (U&G), it demonstrates how gamification elements like rewards, storytelling, and competition fulfill customer needs for entertainment, information, and social interaction (Malik & Singh, 2024; Hamari, 2017). Gamification enhances brand interaction, which positively impacts participation and retention (Koivisto & Hamari, 2019). Interaction mediates these relationships, fostering active participation and long-term loyalty. The framework's six hypotheses highlight gamification's role in shaping customer behavior, particularly in the competitive Saudi telecommunications sector.



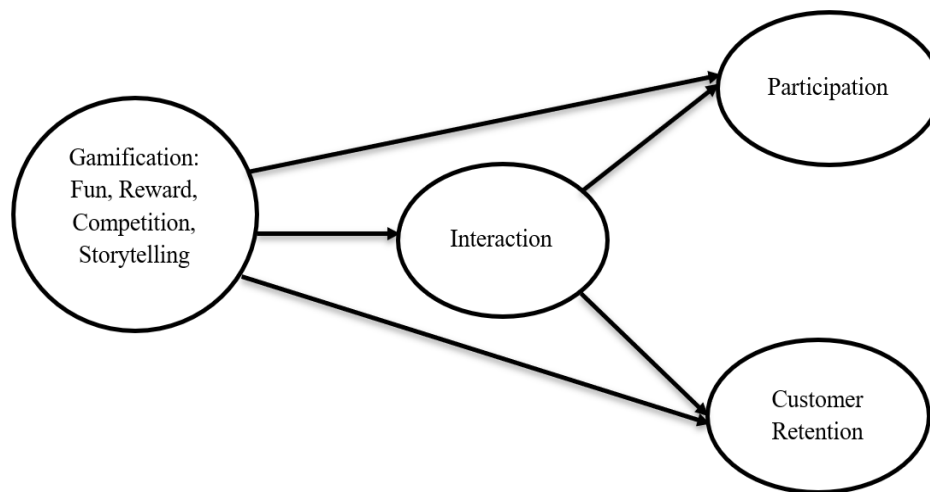


Figure 1: research model.

### 3.8. Research gap

This research focuses on addressing the underexplored potential of gamification in the Saudi telecommunications sector. While gamification has been studied extensively in areas like education, e-commerce, and general marketing, limited attention has been given to its specific application in telecommunications, a field marked by intense competition and rapid digital transformation. Furthermore, the mediating role of brand interaction in connecting gamification with customer participation and retention remains insufficiently examined. By addressing these gaps, this study aims to provide insights that enhance customer engagement and foster loyalty in the Saudi market through optimized gamification strategies.

## 4. METHODOLOGY

This research adopts a quantitative approach to examine the relationships between gamification, customer interaction, participation, and retention in the Saudi telecommunications sector. The study utilized a survey method to collect primary data, following its extensive use in similar research contexts. A structured questionnaire was distributed both manually and electronically to customers of major telecom providers, including STC, Zain, and Mobily.

### 4.1. Measures

All constructs were assessed using reflective measures on a five-point Likert scale (1 = “strongly disagree” to 5 = “strongly agree”). Gamification, a second-order construct, was measured through four first-order constructs (fun, rewards, competition, and storytelling) with 12 items adapted from Lee and Jin (2019). Interaction was measured with five items from Harrigan et al. (2017). Customer participation and retention, the dependent variables, were measured using five-item scales from Chen and Chen (2017) and Gao et al. (2021), respectively.

### 4.2. Data Collection and Sample

The survey method was used to collect primary data, following its frequent use in similar research. Questionnaires were distributed manually and electronically to customers of mobile phone service companies. Out of 410 collected responses, 378 were valid for analysis, with 32 excluded due to straight-lining (15 cases), outliers (9 cases), and missing values (8 cases). Table 1 summarizes the sample description by gender, age, education, income, and telecom provider.

**Table 1:** Sample description.

Variable	Classification	Frequency	Percentage (%)
Gender	Male	227	60.0
	Female	151	40.0
	Total	378	100.0
Age	Under 20 Years Old	41	10.8
	Between 20 and 30	143	37.8
	Between 30 and 40	105	27.8
	Between 40 and 50	62	16.4
	Above 50 years Old	27	7.2
	Total	378	100.0
		Less than college	69
Education Level	College	85	22.5
	Bachelor's degrees	177	46.8
	Postgraduate degrees	47	12.4
	Total	378	100.0
Income	Less than 5000 Sar	49	13.0
	From 5000 to 10000 Sar	188	49.7
	From 10000 to 20000 Sar	102	27.0
	More than 20000 Sar	39	10.3
	Total	378	100.0
Company	STC	192	50.8
	Mobily	114	30.2
	Zain	72	19.0
	Total	378	100.0

Table 1 summarizes the demographics of 378 participants. Males make up 60% and females 40%. Most participants are aged 20–30 (37.8%) or 30–40 (27.8%). Regarding education, 46.8% hold a bachelor's degree, and 12.4% have postgraduate degrees. Nearly half earn SAR 5,000–10,000 (49.7%), and STC is the most used telecom provider (50.8%), followed by Mobily (30.2%) and Zain (19%). This distribution provides a clear representation of the targeted population, ensuring the sample aligns with the study's focus on gamification and customer interaction within the Saudi telecommunications industry.

#### 4.3. Data Analysis

This study uses Smart PLS 4.0 software with the partial least squares (PLS) method to analyze the measurement and structural models and test research hypotheses. PLS-SEM, a multivariate technique that minimizes unexplained variance in endogenous variables (Quoquab et al., 2021), was chosen for its ability to estimate complex models and structural paths without distributional assumptions (Hair et al., 2019).

## 5. RESULTS

### 5.1. Evaluating the Reflective Measurement Model

The model includes a second-order factor for gamification, requiring evaluation of the reflective measurement model at both first and second orders. At the first order, the model was assessed for indicator consistency, internal consistency reliability, convergent validity, and discriminant validity (Figure 2). Table 2 presents the factor loading results for the main variables—Gamification, Interaction, Participation, and Customer Retention—including gamification's sub-variables: fun, rewards, competition, and storytelling.

**Table 2:** Measurement items of the first -order constructs

Construct and Items	Standardized Loading (sig.)	Alpha	CR	AVE
<b>Gamification</b>				
Fun		0.853	0.901	0.752
Fun1: The mobile app game offered by the Saudi telecommunications brand provides a variety of visually appealing features.	0.866**			
Fun2: The mobile app game offered by the Saudi telecommunications brand is engaging.	0.877**			
Fun3: The mobile app game offered by the Saudi telecommunications brand provides entertainment.	0.857**			
<b>Reward</b>				
Rew4: I can enhance my ranking by engaging with the game on the Saudi telecommunications brand's app.	0.861**	0.818	0.892	0.733
Rew5: The mobile app provided by the Saudi telecommunications brand offers various rewards (e.g., gifts for a game character).	0.838**			
Rew6: I can achieve a new identity or status by reaching the highest ranking on the Saudi telecommunications brand's app.	0.868**			
<b>Competition</b>				
Comp7: I can build relationships with other users through games on the Saudi telecommunications brand's app.	0.891**	0.874	0.922	0.798
Comp8: I can compare my score rankings with those of other users on the Saudi telecommunications brand's app.	0.901**			
Comp9: I can compete with other users through the Saudi telecommunications brand's app.	0.888**			
<b>Storytelling</b>				
Stor10: The story of the Saudi telecommunications brand is engaging.	0.914**	0.799	0.883	0.718
Stor11: The story of the Saudi telecommunications brand is likable.	0.714**			
Stor12: The story of the Saudi telecommunications brand is easy to comprehend.	0.900**			
<b>Interaction</b>				
Inter1: In general, I like to get involved in discussions within the telecommunications platform community.	0.732**	0.864	0.902	0.649
Inter2: I am someone who enjoys interacting with like-minded individuals in the telecommunications platform community.	0.823**			
Inter3: I am someone who likes actively participating in the telecommunications platform community discussions.	0.842**			
Inter4: In general, I thoroughly enjoy exchanging ideas with other people in the telecommunications platform community.	0.832**			
Inter5: I often participate in activities organized by the telecommunications platform community.	0.793**			
<b>Participation</b>				
Parti1: I spent a lot of time-sharing information about my needs and opinions with the staff during the service process.	0.793**	0.851	0.893	0.626
Parti2: I put a lot of effort into expressing my personal needs to the staff during the service process.	0.808**			
Parti3: I always provide suggestions to the staff for improving the service outcome.	0.842**			
Parti4: I have a high level of participation in the service process.	0.832**			
Parti5: I am very much involved in deciding how the services should be provided.	0.793**			
<b>Customer Retention</b>				
CusRe1: I feel a strong sense of loyalty toward this Saudi telecommunications company.	0.827**	0.871	0.907	0.661
CusRe2: Even if accessing this Saudi telecommunications company becomes challenging, I would continue using their services.	0.840**			
CusRe3: I am highly committed to this Saudi telecommunications company.	0.822**			
CusRe4: I am willing to make an effort to continue using this Saudi telecommunications company's services.	0.821**			
CusRe5: I care deeply about this Saudi telecommunications company, which I frequently patronize.	0.753**			

**Note:** \*\*P < 0.01. Alpha refers to Cronbach's Alpha, CR refers to Composite reliability and AVE is average variance extracted.

Table 2 summarizes the measurement items and reliability metrics for the study constructs. All constructs demonstrate strong internal consistency, with Cronbach's alpha values exceeding 0.7 and standardized loadings above 0.708 ( $p < 0.01$ ), ensuring reliability and validity (Hair et al., 2019). For instance, "fun" shows a composite reliability (CR) of 0.901 and an average variance extracted (AVE) of 0.752, with similar robustness observed for "reward," "competition," and "storytelling," each with  $CR > 0.85$  and  $AVE > 0.5$ . These results confirm the reliability and validity of the measurement items, providing a solid foundation for analysis. Table 3 evaluates discriminant validity using Fornell and Larcker's (1981) criteria. The square root of the AVE for each construct exceeds its correlations with other constructs, confirming discriminant validity.

**Table 3:** Descriptive statistics and correlations between constructs (Fornell-Lacker method).

No.	Construct	1	2	3	4	5	6	7
1	Fun	0.867						
2	Reward	0.491**	0.856					
3	Competition	0.517**	0.595**	0.894				
4	Storytelling	0.543**	0.482**	0.432**	0.847			
5	Interaction	0.564**	0.535**	0.524**	0.518**	0.805		
6	Participation	0.529**	0.476**	0.562**	0.498**	0.670**	0.791	
7	Customer Retention	0.530**	0.523**	0.595**	0.509**	0.637**	0.687**	0.813
	Mean	4.057	3.933	3.896	3.748	3.915	3.931	3.856
	Standard Deviation	0.798	0.850	0.903	0.972	0.842	0.786	0.835

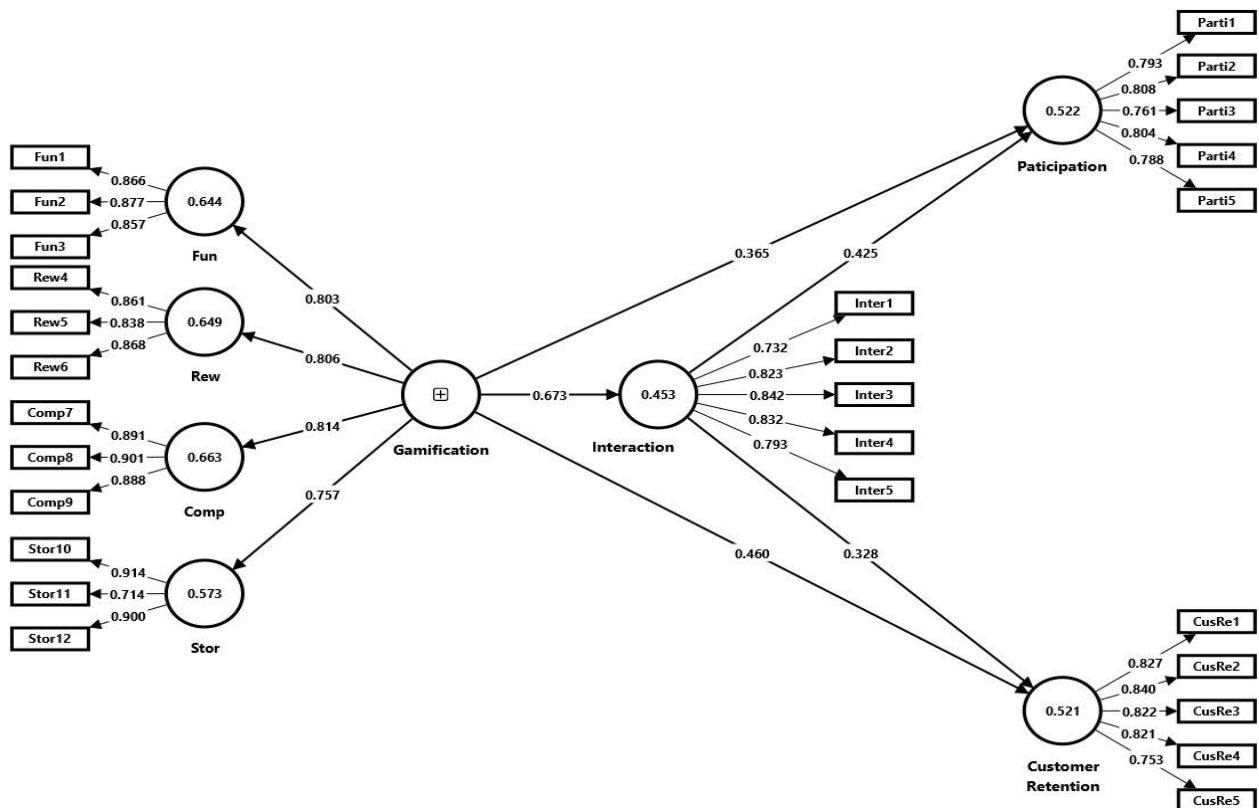
Note: \*\*P < 001; Square root of AVE is typed in *italics bold* along the diagonal.

While the Fornell and Larcker (1981) criterion is widely used to assess discriminant validity, it is less sensitive. Henseler et al. (2015) proposed the heterotrait-monotrait ratio (HTMT) as a more robust alternative, comparing heterotrait-heteromethod correlations to monotrait-heteromethod correlations for improved validity assessment.

**Table 4:** Heterotrait-monotrait (HTMT) criterion values

No.	Construct	1	2	3	4	5	6	7
1	Fun							
2	Reward	0.590						
3	Competition	0.603	0.703					
4	Storytelling	0.657	0.586	0.509				
5	Interaction	0.659	0.635	0.602	0.618			
6	Participation	0.626	0.569	0.648	0.594	0.772		
7	Customer Retention	0.618	0.616	0.680	0.604	0.733	0.798	

Table 4 presents the HTMT values for assessing discriminant validity. All values are below the conservative threshold of 0.85 (Hair et al., 2019), with the highest being 0.772 between Participation and Interaction, confirming good discriminant validity. These results demonstrate that each construct is distinct and reliably measured, supporting the robustness of the structural model. Figure 2 illustrates the first-order reflective measurement model.



**Figure 2:** The reflective measurement model (First-order).

Figure 2 illustrates the first-order reflective measurement model, highlighting the relationships between gamification, interaction, participation, and customer retention. Standardized loadings ( $p < 0.01$ ) indicate high reliability, with Composite Reliability (CR) and Average Variance Extracted (AVE) values exceeding recommended thresholds. These results confirm the constructs' validity in capturing the impact of gamification



on key outcomes within the Saudi telecommunications sector. For the second-order constructs, the repeated indicators approach was initially applied, followed by Becker et al.'s (2012) two-stage approach. First-order constructs were evaluated, and their latent variables were used as manifest variables for second-order constructs (Figure 3). Tables 5 and 6 detail the validity and reliability results for these constructs.

**Table 5:** Measurement items of the second-order constructs.

Construct and Items	Standardized Loading (sig.)	Alpha	CR	AVE
<b>Gamification</b>		0.806	0.873	0.632
Fun	0.808			
Reward	0.804			
Competition	0.803			
Storytelling	0.865			

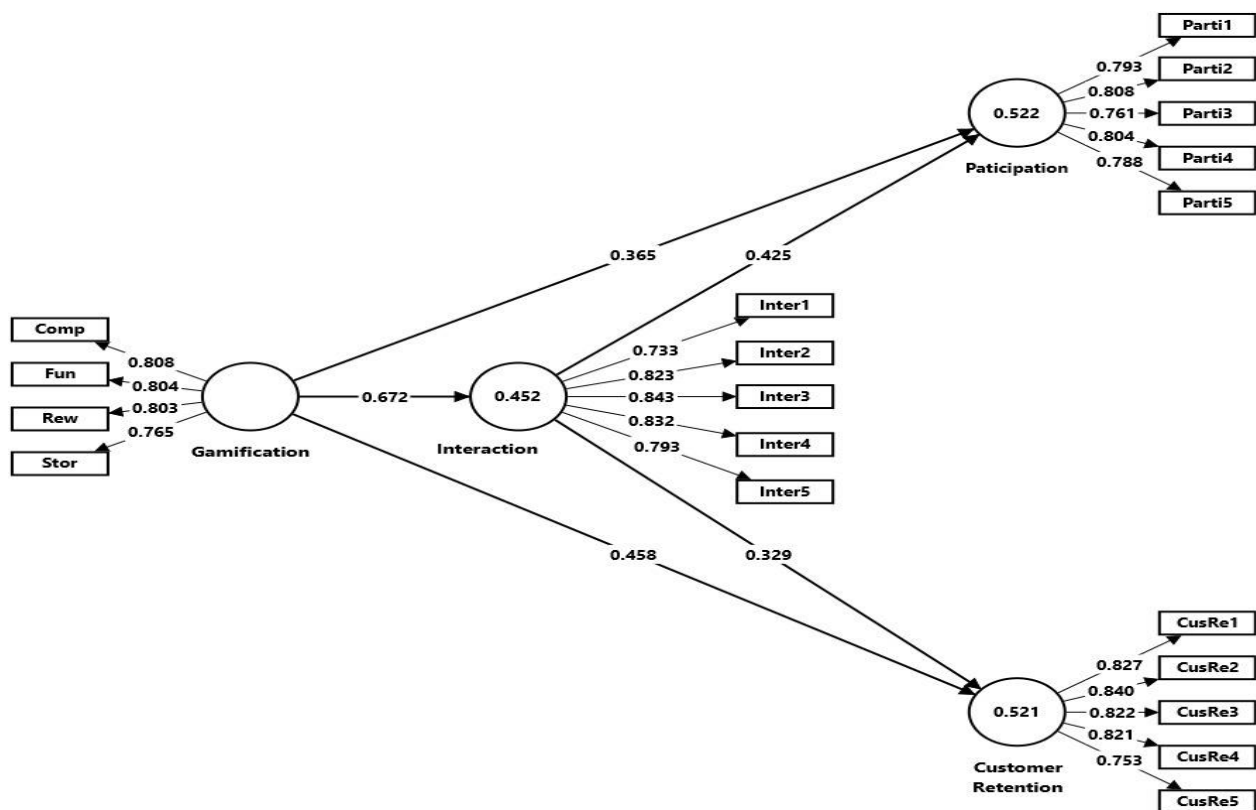
**Note:** \*\*P < 0.01. Alpha refers to Cornbach's Alpha, CR refers to Composite reliability and AVE is average variance extracted.

Table 5 presents the second-order construct of gamification, including fun, reward, competition, and storytelling. Standardized loadings range from 0.803 to 0.865, indicating strong contributions from each dimension. Reliability measures are robust, with Cronbach's alpha at 0.806, composite reliability (CR) at 0.873, and an AVE of 0.632, confirming internal consistency and validity. These results validate the gamification construct as effectively representing its intended dimensions.

**Table 6:** Heterotrait-monotrait (HTMT) criterion values for second-order.

No.	Construct	1	2	3	4
4	Gamification				
5	Interaction	0.804			
6	Participation	0.781	0.772		
7	Customer Retention	0.806	0.733	0.798	

Table 6 confirms discriminant validity for second-order constructs, with all HTMT values below 0.85. The highest values, between Interaction and Participation (0.772) and Customer Retention and Participation (0.798), remain within acceptable limits. These results ensure the constructs uniquely measure gamification, interaction, participation, and retention. Figure 3 illustrates the second-order reflective measurement model.



**Figure 3:** The reflective measurement model (Second-order).

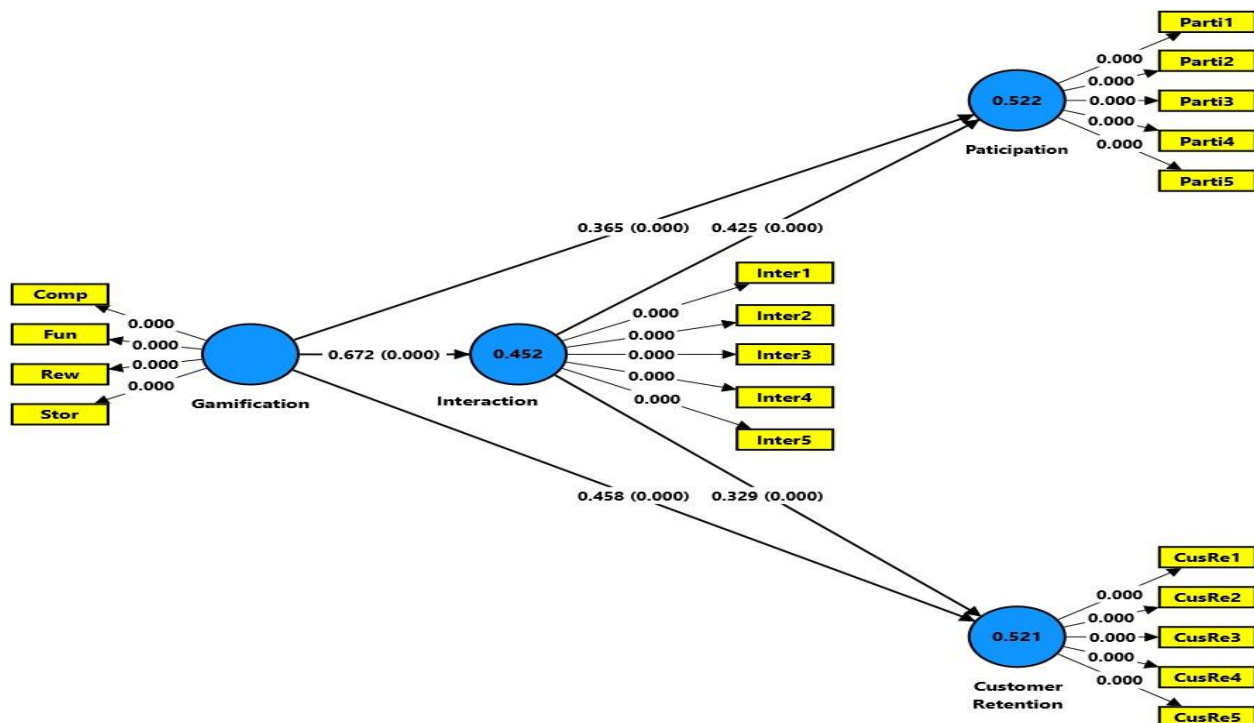
### 5.2. Evaluating the Structural Model

To evaluate the structural model shown in Figure 4, we used the variance inflation factor (VIF), effect size ( $f^2$ ), and coefficient of determination ( $R^2$ ) to assess the explained variance. The results of these three criteria are presented in Table 7.

**Table 7:** Structural model evaluation.

Construct	VIF Collinearity Assessment	Confidence Intervals		F <sup>2</sup> Effect Size	Level of R <sup>2</sup>
		95% (BCa) bootstrap 2.5%	97% 97%		
Gamification	1.000	0.597	0.733	0.824	
	1.824	0.259	0.477	0.152	
	1.764	0.245	0.348	0.562	
Interaction	1.824	0.178	0.307	0.530	0.452
Participation	1.672	0.086	0.215	0.437	0.522
Customer Retention					0.521

Table 7 evaluates the structural model, providing insights into the relationships between constructs. The variance inflation factor (VIF) values are all below the threshold of 5, indicating no multicollinearity issues. The R<sup>2</sup> values highlight strong explanatory power, with interaction (R<sup>2</sup> = 0.452), participation (R<sup>2</sup> = 0.522), and customer retention (R<sup>2</sup> = 0.521) demonstrating significant variance explained by gamification and other factors. Confidence intervals and effect sizes (f<sup>2</sup>) further support the model's robustness, with gamification showing substantial direct and mediated effects on interaction, participation, and retention. These results validate the hypothesized relationships, affirming the model's suitability for exploring gamification's impact within the Saudi telecommunications sector. our structural model had no critical issue of collinearity among the predictor constructs (Sarstedt et al., 2022).

**Figure 4:** The structural model.

### 5.3. Hypotheses Tests

The “direct effect” hypotheses were tested first by examining the standardized path (beta) coefficients and associated significance levels, Bootstrapping procedures with 5,000 resamples were used to test the significance of the path coefficients. The results first support the proposition that gamification reflected through fun, reward, competition, and storytelling has direct positive and significant impact on interaction (H1:  $\beta = 0.672$ ,  $p < 0.01$ , CI = 0.597 to 0.733), this result lends support to H1. Next, interaction had a positive and significant impact on customer participation (H2:  $\beta = 0.425$ ,  $p < 0.01$ , CI = 0.178 to 0.307), this result also lends support to H2. also, interaction exerted a direct positive influence on customer retention (H3:  $\beta = 0.329$ ,  $p < 0.01$ , CI = 0.086 to 0.215), thereby supporting H3. On the other hand, gamification positively influenced the participation (H4:  $\beta = 0.365$ ,  $p < 0.01$ , CI = 0.259 to 0.477), in support of H4. At the end of the direct analysis, it was found that gamification has a positive and significant effect on customer retention (H5:  $\beta = 0.458$ ,  $p < 0.01$ , CI = 0.245 to 0.348), this also supports H5.

**Table 8:** Structural model estimates.

Hypothesis				$\beta$	CR	P-Value	Results
H1	Gamification	→	Interaction	0.672	19.74	<0.01	Supported
H2	Interaction	→	Participation	0.425	7.64	<0.01	Supported
H3	Interaction	→	Customer Retention	0.329	5.84	<0.01	Supported
H4	Gamification	→	Participation	0.365	6.58	<0.01	Supported
H5	Gamification	→	Customer Retention	0.458	8.56	<0.01	Supported
H6a	Gamification	→	Interaction → Participation	0.286	7.24	<0.01	Partial mediation
H6b	Gamification Retention	→	Interaction → Customer	0.221	5.57	<0.01	Partial mediation

The mediating role of Brand awareness hypothesized in H6 and H7 was tested by the bias-corrected (BCa) bootstrap method at 95% confidence intervals (CIs; Cheung and Lau, 2008). Bootstrapping analysis revealed that the standardized coefficient ( $\beta$ ) for the indirect effect of gamification on participation through interaction was significant ( $\beta = 0.286$ , CI = 0.174 to 0.255;  $p < 0.001$ ), this indicates partial mediation due to the significance of the direct effect in the H4. We also find partial mediation of interaction in H7, as the indirect effect of gamification on customer retention through interaction was significant ( $\beta = 0.221$ , CI = 0.152 to 0.208;  $p < 0.001$ ), and at the same time the direct effect of that relationship was found to be significant in the H5. and thus, these results partially support H6a, H6b. A summary of the results is shown in Table 8.

## 6. DISCUSSION

This study examines the direct and indirect effects of gamification on customer participation and retention in the Saudi telecommunications sector, focusing on the mediating role of interaction in these relationships. The results support H1, indicating that gamification has a significant positive effect on brand interaction. Specifically, incorporating game elements such as points, rewards, and storytelling enhances consumer engagement by motivating them both intrinsically and extrinsically. This aligns with Hamari (2017) and Xi and Hamari (2019), who emphasize that gamification fosters loyalty and repeat engagement through enjoyment and social connectivity. Moreover, Koivisto and Hamari (2019) argue that blending entertainment with competitive activities attracts diverse customer demographics and drives brand interaction. However, the success of gamification depends on personalization, as Santos et al. (2021) highlight that tailoring designs to different user types amplifies effectiveness. Additionally, gamification is particularly impactful when aligned with users' motivations, transforming passive consumers into active participants. Thus, gamification emerges as a critical strategy for enhancing brand interaction in marketing contexts.

The results also support H2, showing that brand interaction positively influences customer participation. When consumers actively engage with brands through social media, events, or feedback, they transition from passive recipients to active contributors in the marketing process. This finding aligns with Wang et al. (2021), who assert that participation strengthens emotional and cognitive connections with brands, driving outcomes such as advocacy and repurchase intentions. Similarly, Cheung et al. (2021) and Nobre and Ferreira (2017) emphasize that gamified brand experiences leveraging entertainment and competition enhance interaction and participation, co-creating value. Social media amplifies these effects, with Martín-Consuegra et al. (2018) demonstrating that interactive platforms increase brand involvement and influence behavioral intentions. This is particularly relevant in the Saudi telecommunications sector, where high digital engagement offers ample opportunities for interaction-driven participation. Thus, brand interaction is crucial for fostering relationships and driving loyalty in competitive markets.

The results support H3, showing that brand interaction significantly enhances customer retention. Consistent and meaningful interactions between customers and brands strengthen loyalty and reduce the likelihood of switching to competitors. This finding aligns with Yang et al. (2022), who demonstrated that dynamic, two-way communication via social media improves customer satisfaction and long-term loyalty. Additionally, Alshurideh et al. (2023) highlight the role of social CRM tools in strengthening customer retention through personalized services. Emotional connections also play a pivotal role, as Jang et al. (2020) emphasize that relational brand experiences foster loyalty by creating resonance with the brand. Similarly, Cambra-Fierro et al. (2021) note that positive interactions are critical for building trust and ensuring long-term retention. In the Saudi telecommunications sector, these findings underscore the strategic value of sustained brand interaction in maintaining customer loyalty in a highly competitive market.

The results further support H4, confirming that gamification significantly impacts customer retention. By integrating rewards, achievements, and competition into marketing strategies, brands create engaging and memorable experiences that encourage loyalty and repeat purchases. This aligns with Kridiawan and Wang (2024), who found that personalized gamified experiences enhance emotional connections, improving retention. Similarly, Zhang et al. (2023) and Chen (2023) demonstrated that gamified features like rewards and competition boost retention by driving engagement and satisfaction. However, the effectiveness of gamification depends on maintaining novelty and relevance, as poorly designed systems may lead to disengagement. These findings highlight the potential of gamification as a strategic tool for improving customer retention, particularly in

competitive industries like Saudi telecommunications.

Finally, the results support H6a and H6b, indicating that interaction partially mediates the relationship between gamification and both customer participation and retention. For H6a, gamification fosters participation by creating interactive opportunities such as real-time feedback, competitive tasks, and social collaboration. These elements deepen connections to the brand, aligning with Hamari (2017) and Raman (2020), who argue that gamification motivates participation through immersive experiences. For H6b, interaction strengthens retention by fostering loyalty and long-term engagement through rewards, recognition, and achievement. This finding supports Koivisto and Hamari (2019) and Xi and Hamari (2019), who highlight the role of interaction in promoting loyalty by fulfilling motivational needs. While gamification directly influences participation and retention, interaction amplifies these effects by transforming passive users into active participants. In competitive markets like Saudi telecommunications, leveraging interaction through gamification can significantly enhance both engagement and loyalty.

## 7. CONCLUSION

This study makes key theoretical contributions to understanding gamification in marketing and its impact on customer outcomes. It integrates Uses and Gratifications Theory (U&G) into gamified marketing, showing how gamification fulfills consumer needs for information, entertainment, and social interaction, expanding U&G beyond media studies (Malik & Singh, 2024). The study also identifies the mediating role of interaction between gamification and customer outcomes like participation and retention, emphasizing how two-way communication transforms passive consumers into active participants (Koivisto & Hamari, 2019; Xi & Hamari, 2019). Additionally, it advances Gamification Theory by categorizing elements like rewards, storytelling, and competition as motivational mechanisms driving engagement. It highlights the importance of personalized designs to maximize effectiveness (Santos et al., 2021). Finally, it contextualizes gamification within the Saudi telecommunications sector, addressing regional research gaps and showcasing its role in fostering retention and loyalty in competitive, digitally driven markets (Yang et al., 2022; Alshurideh et al., 2023). These contributions expand gamification research while offering actionable insights for marketing theories.

### 7.1. Theoretical and managerial implications

This study makes key theoretical contributions to understanding gamification in marketing and its impact on customer outcomes. It integrates Uses and Gratifications Theory (U&G) into gamified marketing, showing how gamification fulfills consumer needs for information, entertainment, and social interaction, expanding U&G beyond media studies (Malik & Singh, 2024). The study also identifies the mediating role of interaction between gamification and customer outcomes like participation and retention, emphasizing how two-way communication transforms passive consumers into active participants (Koivisto & Hamari, 2019; Xi & Hamari, 2019). Additionally, it advances Gamification Theory by categorizing elements like rewards, storytelling, and competition as motivational mechanisms driving engagement. It highlights the importance of personalized designs to maximize effectiveness (Santos et al., 2021). Finally, it contextualizes gamification within the Saudi telecommunications sector, addressing regional research gaps and showcasing its role in fostering retention and loyalty in competitive, digitally driven markets (Yang et al., 2022; Alshurideh et al., 2023). These contributions expand gamification research while offering actionable insights for marketing theories.

### 7.2. Practical implications

This study provides practical contributions for businesses aiming to leverage gamification in marketing, particularly in the Saudi telecommunications sector. By demonstrating the effectiveness of gamified elements like rewards, storytelling, and competition, the research offers actionable insights for designing mobile apps and loyalty programs to boost participation and engagement. Gamification also strengthens customer retention through strategies like progressive rewards and achievement systems, helping telecom companies such as STC, Zain, and Mobily reduce churn and build lasting relationships. The findings emphasize the role of interaction as a bridge between gamification and loyalty, encouraging businesses to design campaigns that promote feedback, collaboration, and participation, ultimately transforming engagement into brand advocacy. Personalization is also crucial; tailoring gamified experiences to address customer motivations like competition or socialization ensures relevance and effectiveness. Finally, the study highlights gamification's potential in emerging markets like Saudi Arabia, offering a framework for building trust, satisfaction, and loyalty while achieving sustained growth in highly digitalized contexts.

### 7.3. Limitations and Future Research Directions

This study has limitations that suggest avenues for future research. First, focusing on the Saudi telecommunications sector limits the generalizability of the findings. Expanding to other industries or regions could provide broader insights. Second, the reliance on quantitative methods may overlook nuanced customer motivations, suggesting the need for qualitative approaches like interviews to explore perceptions of gamification. Third, the study examines interaction as a mediator but does not consider moderating factors such as personality



traits or technological literacy, which could influence gamification outcomes. Additionally, the cross-sectional design captures a single moment in time; longitudinal studies could reveal the long-term effects of gamification and address potential diminishing returns from repetitive elements. Lastly, emerging technologies like VR and AI are not explored. Future research could examine their role in enhancing gamified marketing strategies to create immersive and personalized experiences. Addressing these gaps will advance the understanding and application of gamification in marketing.

## REFERENCES

- Ahmad, A., Zeshan, F., Samreen, A., Ali, A., Marriam, R., & Khan, M. S. (2020). The impact of gamification on learning outcomes of computer science majors. *ACM Transactions on Computing Education*, 20(2), 1–25.
- Almuqren, L., & Cristea, A. I. (2023). Predicting STC customers' satisfaction using Twitter. *IEEE Transactions on Computational Social Systems*, 10(1), 204–210.
- Alshurideh, M. T., Al Kurdi, B., AlHamad, A., Hamadneh, S., Alzoubi, H. M., & Ahmad, A. (2023). Does social customer relationship management (SCRM) affect customers' happiness and retention? A service perspective. *Uncertain Supply Chain Management*, 11(2), 277–288.
- Becker, J.-M., Klein, K., & Wetzels, M. (2012). Hierarchical latent variable models in PLS-SEM: Guidelines for using reflective-formative type models. *Long Range Planning*, 45(5), 359–394.
- Berglund, A., Jaarsma, T., Berglund, E., Strömberg, A., & Klompstra, L. (2022). Understanding and assessing gamification in digital healthcare interventions for patients with cardiovascular disease. *European Journal of Cardiovascular Nursing*, 21(6), 630–638.
- Cambra-Fierro, J., Gao, L. X., Melero-Polo, I., & Trifu, A. (2021). How do firms handle variability in customer experience? A dynamic approach to better understanding customer retention. *Journal of Retailing and Consumer Services*, 61, 102578.
- Chen, C.-C. V., & Chen, C.-J. (2017). The role of customer participation for enhancing repurchase intention. *Management Decision*, 55(3), 547–562.
- Chen, Y. T. T. (2023). Gamification in marketing to increase customer retention (Doctoral dissertation, Massachusetts Institute of Technology), 1–30.
- Dikcius, V., Urbonavicius, S., Adomaviciute, K., Degutis, M., & Zimaitis, I. (2020). Learning marketing online: The role of social interactions and gamification rewards. *Journal of Marketing Education*, 42(3), 1–15.
- Ferianda, M. R., Herdiani, A., & Sardi, I. L. (2018). Increasing students' interaction in distance education using gamification. *Proceedings of the 6th International Conference on Information and Communication Technology (ICoICT)*, 125–129.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50.
- Gao, W., Li, W., Fan, H., & Jia, X. (2021). How customer experience incongruence affects omnichannel customer retention: The moderating role of channel characteristics. *Journal of Retailing and Consumer Services*, 60, 102487.
- Gatautis, R., Banytė, J., & Vitkauskaitė, E. (2021). Gamification and consumer engagement. *Progress in IS*.
- Goldberg, R. (2024). Gamification in fashion retail: Assessing contributions to customer loyalty, retention, and brand recall in the South African market. *Malaysian E-Commerce Journal (MECJ)*, 8(2), 51–56.
- Govindarajan, R. (2020). Exploiting gamification and interactive activities to achieve better students' engagement in ELT classes. *Arab World English Journal (AWEJ)*, *Proceedings of the 2nd MEC TESOL Conference 2020*, 238–251.
- Gupta, S., & Dutt, R. (2024). Identifying consumer-based digital content marketing consumption motives: A qualitative study. *Journal of Advances in Management Research*, 1–17.
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24.
- Hallifax, S., Lavoué, E., Serna, A., Lavoué, G., & Marty, J.-C. (2019). Factors to consider for tailored gamification. 559–572.
- Hamari, J. (2017). Do badges increase user activity? A field experiment on the effects of gamification. *Computers in Human Behavior*, 71, 469–478.
- Harrigan, P., Evers, U., Miles, M., & Daly, T. (2017). Customer engagement with tourism social media brands. *Tourism Management*, 59, 597–609.
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43, 115–135.
- Hwang, J., & Choi, L. (2019). Having fun while receiving rewards? Exploration of gamification in loyalty programs for consumer loyalty. *Journal of Business Research*, 106, 365–376.
- Ijomah, T. I., Idemudia, C., & Eyo-Udo, N. L. (2024). The role of big data analytics in customer relationship management: Strategies for improving customer engagement and retention. *World Journal of Advanced Science and Technology*, 6(1), 13–24.
- Jang, K. K., Bae, J., & Kim, K. H. (2020). Servitization experience measurement and the effect of servitization experience on brand resonance and customer retention. *Journal of Business Research*, 117, 303–315.
- Kridiawan, Y., & Wang, G. (2024). The effect of gamification on customer retention in automotive after-sales services: A case study of the authorized car dealer in Indonesia. *Community Practitioner: The Journal of the Community Practitioners' & Health Visitors' Association*, 21(4), 887–906.
- Liu, X., Zhou, Z., Yuen, K. F., & Wang, X. (2024). Green and gamified! An investigation of consumer participation in green last-mile from a gamification affordance perspective. *Journal of Retailing and Consumer Services*, 79, 103808.
- Lopes, J. M., Redondo, V., Cardoso, M., Gomes, S., Lourenço, D., Lopes, P., Silva, A., & Esteves, D. (2023). Exploring the role of gamification in the online shopping experience in retail stores: An exploratory study. *Social Sciences*, 12(4), 235.
- Malik, G., & Singh, P. (2024). Reflecting uses and gratification 2.0 perspective into over-the-top (OTT) consumption: Role of collaboration design and cross-platform navigability. *Services Marketing Quarterly*, 1–27.
- Merhabi, M. A., Petridis, P., & Khusainova, R. (2021). Gamification for brand value co-creation: A systematic literature review. *Information*, 12(9), 345.
- Raman, P. (2021). Examining the importance of gamification, social interaction, and perceived enjoyment among young female online buyers in India. *Young Consumers*, 22(3), 387–412.
- Rahmadhan, M. A. W. P., Kautsarina, K., Sensesu, D. I., & Suryono, R. R. (2023). Trends and applications of gamification in e-commerce: A systematic literature review. *Journal of Information Systems Engineering and Business Intelligence*, 9(1), 28–37.
- Santos, A. C. G., Oliveira, W., Hamari, J., Rodrigues, L., Toda, A. M., Palomino, P. T., & Isotani, S. (2021). The relationship between user types and gamification designs. *User Modeling and User-Adapted Interaction*, 31(4), 907–940.



- Syrjälä, H., Kauppinen-Räsänen, H., Luomala, H. T., Joelsson, T. N., Könnölä, K., & Mäkilä, T. (2020). Gamified package: Consumer insights into multidimensional brand engagement. *Journal of Business Research*, *119*, 423–434.
- Thiel, S.-K., Reisinger, M., Röderer, K., & Fröhlich, P. (2016). Playing (with) democracy: A review of gamified participation approaches. *JeDEM - EJournal of EDemocracy and Open Government*, *8*(3), 32–60.
- Tobon, S., Ruiz-Alba, J. L., & García-Madariaga, J. (2019). Gamification and online consumer decisions: Is the game over? *Decision Support Systems*, *128*, 113167.
- Vashisht, D. (2023). Engaging and entertaining customers: Gamification in interactive marketing. In *The Palgrave Handbook of Interactive Marketing* (pp. 807–835). Cham: Springer International Publishing.
- Wang, C. L. (2021). New frontiers and future directions in interactive marketing: Inaugural editorial. *Journal of Research in Interactive Marketing*, *15*(1), 1–9.
- Wulantari, N. P., Rachman, A., Sari, M. N., Uktolseja, L. J., & Rofi'i, A. (2023). The role of gamification in English language teaching: A literature review. *Journal on Education*, *6*(1), 2847–2856.
- Xi, N., & Hamari, J. (2019). Does gamification satisfy needs? A study on the relationship between gamification features and intrinsic need satisfaction. *International Journal of Information Management*, *46*, 210–221.
- Xu, Y., Chen, Z., Anser, M. K., & Peng, M. Y.-P. (2020). Enhancing consumer online purchase intention through gamification in China: Perspective of cognitive evaluation theory. *Frontiers in Psychology*, *11*(922).
- Yang, Q., Hayat, N., Al Mamun, A., Makhbul, Z. K. M., & Zainol, N. R. (2022). Sustainable customer retention through social media marketing activities using hybrid SEM-neural network approach. *PLOS ONE*, *17*(3), e0264899.
- Zhang, L., Shao, Z., Benitez, J., & Zhang, R. (2023). How to improve user engagement and retention in mobile payment: A gamification affordance perspective. *Decision Support Systems*, *168*, 113941.