

The Role of Gamification and Artificial Intelligence Stimuli in Driving Customer Engagement: A Study on Saudi Telecom Users' Ability Readiness

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Abstract

This study examines the impact of gamification in marketing and artificial intelligence (AI) stimuli on customer engagement, with customer ability readiness as a moderating factor in the Saudi telecommunications sector. Using the Stimulus-Organism-Response (SOR) model, this research investigates how AI-driven personalization and gamification strategies influence customer interactions, motivation, and loyalty. A quantitative research approach was employed, utilizing Structural Equation Modeling (SEM) to analyze survey responses from 400 Saudi telecom users. The results confirm that gamification and AI stimuli positively influence customer engagement, with customer ability readiness significantly moderating these relationships. Consumers with higher technological proficiency are more likely to benefit from AI-driven and gamified experiences, while those with lower readiness may struggle to engage effectively. These findings highlight the importance of designing adaptive and inclusive marketing strategies tailored to different levels of digital proficiency. This study contributes to the theoretical literature by expanding the SOR model to include customer ability readiness as a moderating factor. It also provides practical insights for marketers in the Saudi telecom industry, emphasizing the need for personalized, user-friendly AI and gamification strategies. The findings align with Saudi Vision 2030's goals of digital transformation and customer-centric innovation, offering valuable implications for businesses seeking to enhance customer engagement.

Keywords: gamification; artificial intelligence; engagement; digital marketing; readiness

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1. Introduction

In the digital era, businesses are increasingly leveraging advanced technologies to enhance customer engagement and brand loyalty. Among these innovations, gamification in marketing and artificial intelligence (AI) stimuli have transformed how brands interact with consumers by integrating interactive and intelligent systems into marketing strategies. Gamification employs game-like elements such as points, rewards, challenges, and leaderboards to create engaging and immersive brand experiences, encouraging consumer participation and long-term commitment (Elwakeel et al., 2025). Meanwhile, AI stimuli utilize technologies

such as personalized recommendations, predictive analytics, and conversational AI to deliver customized experiences that cater to individual consumer preferences, ultimately fostering deeper engagement (Teepapal, 2025). These advancements are particularly relevant to the telecommunications sector, where customer engagement is a key driver of competitive advantage and business sustainability. The integration of AI and gamification aligns with Saudi Vision 2030, which emphasizes digital transformation, innovation, and enhanced consumer experiences as part of the Kingdom's economic diversification strategy (Habib et al., 2025). Saudi Arabia's focus on fostering a digital economy has led to significant investments in artificial intelligence, big data, and emerging marketing technologies, enabling businesses to optimize customer engagement strategies. As the telecom sector plays a crucial role in enabling Vision 2030's digital ambitions, leveraging AI-driven personalization and gamified marketing techniques can help telecom providers enhance customer satisfaction, improve service efficiency, and strengthen brand loyalty.

To understand how AI stimuli and gamification impact customer engagement, the Stimulus-Organism-Response (SOR) model provides a relevant theoretical framework. This model explains how external stimuli — such as AI-driven personalization and gamification — trigger cognitive and emotional responses in consumers, leading to engagement behaviors (Hlee et al., 2023). However, not all consumers respond equally to these digital marketing strategies. One critical factor influencing engagement levels is customer ability readiness, which refers to an individual's proficiency, confidence, and familiarity with digital technologies. Consumers with higher ability readiness are more likely to navigate and benefit from AI-driven interactions and gamified experiences, while those with lower readiness may struggle with digital interfaces, leading to frustration and disengagement (Gao et al., 2023). Despite the proven effectiveness of AI stimuli and gamification in enhancing customer engagement, their impact varies significantly based on individual consumer capabilities. Some consumers readily engage with AI-powered recommendations and gamified experiences, perceiving them as seamless and valuable, while others find them complex or intrusive, which may hinder their engagement levels. This disparity presents a research gap in understanding the moderating role of customer ability readiness in AI- and gamification-driven marketing strategies. While previous studies have explored the direct effects of AI and gamification on engagement, there is limited research on how individual technological adaptability influences these relationships, particularly in the Saudi telecommunications sector. Addressing this gap is crucial for developing inclusive and adaptive marketing strategies that cater to diverse consumer segments.

As businesses increasingly adopt AI-driven and gamified marketing strategies, understanding the role of customer ability readiness becomes essential for maximizing engagement. Consumers with high technological adaptability may find AI recommendations useful and gamification elements engaging, reinforcing positive brand experiences. In contrast, individuals with lower ability readiness may require more user-friendly interfaces, enhanced guidance, and simplified engagement mechanisms to avoid frustration and disengagement (Ding et al., 2024). By identifying these variations, businesses can optimize their AI- and gamification-driven marketing strategies to ensure accessibility and effectiveness across different consumer demographics. The findings of this research will be particularly relevant to Saudi Arabia's telecommunications sector, where digital engagement plays a pivotal role in customer satisfaction and retention. As the Kingdom moves toward a digitally driven economy under Vision 2030, telecom providers must innovate their engagement strategies to meet evolving consumer expectations. Understanding how customer ability readiness moderates the effectiveness of AI and gamification will allow telecom companies to design more personalized, interactive, and inclusive experiences, ultimately fostering stronger consumer relationships and contributing to the broader national strategy of digital transformation.

This study seeks to address the following research questions: (1) How does gamification in marketing influence customer engagement in the Saudi telecom sector? (2) How do AI stimuli affect customer engagement in AI-driven marketing strategies? (3) To what extent does customer ability readiness moderate the relationship between gamification in marketing and customer engagement? (4) To what extent does customer ability readiness moderate the relationship between AI stimuli and customer engagement? Answering these questions will provide insights into optimizing AI- and gamification-based marketing efforts, ensuring that digital strategies align with consumer readiness and maximize engagement across diverse user segments. By examining these relationships, this study aims to contribute to both academic

literature and practical marketing strategies within the Saudi telecom sector. The findings offers valuable implications for marketers, policymakers, and technology developers seeking to enhance customer engagement through AI and gamification. Furthermore, the research aligns with Saudi Vision 2030's objectives by promoting digital transformation and fostering innovation-driven economic growth. By leveraging AI stimuli and gamification effectively, telecom providers can improve service delivery, enhance customer satisfaction, and contribute to the Kingdom's broader ambitions of becoming a leading digital economy.

2. Conceptual Model

2.1. Gamification in Marketing

Gamification in marketing refers to the application of game-like elements, such as rewards, storytelling, and competition, to enhance customer engagement and brand interaction. By integrating motivational mechanics, gamification fosters participation, loyalty, and customer retention, making marketing experiences more interactive and enjoyable. Grounded in the Uses and Gratifications Theory (U&G), gamification satisfies intrinsic and extrinsic consumer motivations, ensuring sustained engagement in competitive industries like telecommunications (Elwakeel et al., 2025).

2.2. AI Stimuli

AI stimuli refer to digital triggers generated by artificial intelligence systems that influence consumer perceptions, emotions, and behaviors. These stimuli include personalized recommendations, conversational AI, predictive analytics, and automated decision-making processes that shape user interactions with brands and services (Teepapal, 2025). By leveraging real-time data processing and machine learning, AI stimuli enhance engagement by providing tailored experiences, reducing cognitive effort, and improving service efficiency (Hlee et al., 2023). However, their effectiveness depends on user trust, perceived usefulness, and adaptability to AI-driven interactions. Well-designed AI stimuli foster positive engagement, while poorly implemented systems may lead to skepticism and reduced consumer confidence (Gao et al., 2023).

2.3. Customer Ability Readiness

Customer ability readiness refers to a consumer's skills, confidence, and familiarity with digital technologies, affecting their ability to engage with AI-driven systems and gamified marketing (Gao et al., 2023). High readiness enhances user experience and interaction, while low readiness may create barriers and reduce engagement (Teepapal, 2025). As a moderating factor, it influences how effectively consumers respond to digital marketing strategies, requiring businesses to design user-friendly experiences that accommodate varying levels of technological adaptability (Hlee et al., 2023).

2.4. Customer Engagement

Customer engagement refers to the depth of a consumer's emotional, cognitive, and behavioral connection with a brand through interactive experiences. It encompasses active participation, loyalty, and advocacy, driven by meaningful interactions across digital and physical touchpoints (Gao et al., 2023). Engaged customers exhibit higher retention rates and stronger brand relationships, as engagement fosters satisfaction and long-term commitment (Teepapal, 2025). AI-driven personalization and gamification further enhance engagement by creating immersive and tailored experiences that sustain consumer interest and involvement (Hlee et al., 2023). However, engagement effectiveness depends on perceived value, interactivity, and trust in brand interactions.

3. Literature Review and Hypotheses Development

3.1. Gamification in Marketing and Customer Engagement

Gamification has emerged as a powerful marketing strategy that enhances customer engagement by incorporating game-like elements to create immersive and interactive experiences. Research suggests that gamification fosters engagement by fulfilling fundamental psychological needs, including competence, autonomy, and relatedness, which ultimately drive motivation and sustained interactions with brands (Bitrián et al., 2021). By integrating elements such as points, leaderboards, and challenges, brands create engaging consumer experiences that encourage continued participation and brand loyalty (Koivisto & Hamari, 2019). Furthermore, gamification influences consumer behavior by fostering a sense of achievement, enjoyment, and social belonging, which are critical factors in sustaining long-term engagement (Huotari & Hamari, 2017). Building on these foundations, the incorporation of game mechanics not only strengthens customer-brand relationships but also enhances marketing effectiveness by driving positive consumer behaviors, including word-of-mouth promotion and repeat purchases. Studies indicate that achievement-related features, such as leaderboards and reward systems, enhance cognitive engagement by fostering goal-driven behaviors, while immersive elements, including storytelling and avatars, deepen emotional brand attachment (Putranti et al., 2024). Additionally, social features, such as competition and collaboration, contribute to increased brand engagement by fostering consumer interactions and community building (Xi & Hamari, 2019). Through well-designed gamification strategies, businesses can create meaningful and rewarding experiences that encourage customer participation, ultimately leading to higher levels of loyalty and long-term retention.

However, the success of gamification largely depends on its design and alignment with consumer preferences. Poorly implemented gamification strategies may result in disengagement rather than motivation, particularly if competitive elements overshadow intrinsic rewards (Alsawaier, 2018). Adaptive gamification, which tailors game elements to individual user preferences, has been shown to be particularly effective in sustaining engagement over time (Puig et al., 2023). Moreover, a review of IoT-enabled gamification highlights its potential to enhance engagement through real-time interaction, personalized feedback, and immersive experiences, reinforcing the importance of responsiveness in gamified marketing strategies (Xiao et al., 2022). Despite its advantages, engagement levels may decline over time due to the diminishing novelty effect, further emphasizing the need for continuous optimization of gamification elements to maintain long-term customer involvement (Looyestyn et al., 2017). Beyond traditional gamification techniques, the integration of artificial intelligence (AI) into gamified marketing strategies has revolutionized customer engagement by enhancing personalization and interactivity. AI-powered gamification enables real-time user adaptation, providing tailored challenges and rewards that align with individual consumer behaviors and preferences (Huang et al., 2024). The stimulus-organism-response (SOR) model further explains how AI-driven stimuli act as external triggers, influencing cognitive and emotional responses that foster deeper engagement (Singh & Milan, 2025). Additionally, AI-enabled gamification in social media marketing has been shown to amplify user participation and brand interactions by incorporating elements of entertainment, trendiness, and customization (Cigdem et al., 2024).

Despite the promising impact of AI-driven gamification on consumer engagement, its effectiveness depends on critical factors such as trust, perceived usefulness, and user experience. Transparency in AI-driven recommendations and the ethical use of consumer data are paramount to ensuring long-term engagement and brand loyalty. As AI technology continues to advance, businesses must strike a balance between automation and human interaction to create engaging, ethical, and sustainable gamification strategies (Rivera & Garden, 2021). By leveraging AI-powered gamification, brands can provide personalized, interactive experiences that not only capture consumer interest but also foster lasting customer relationships, ultimately driving marketing success.

H1: Gamification in marketing positively influence customer engagement

3.2. AI Stimuli and Customer Engagement

In the digital era, AI stimuli have become a critical factor in shaping customer engagement by enhancing interactivity, personalization, and automation in marketing strategies. AI-driven technologies, including chatbots, recommendation systems, and predictive analytics, facilitate meaningful consumer interactions, strengthening engagement and loyalty (Hamadneh, 2024). The Stimulus-Organism-Response (SOR) framework provides a theoretical basis for understanding how AI stimuli act as external triggers, shaping cognitive and emotional responses that drive consumer behavior and engagement (Singh & Milan, 2025). By dynamically adapting content, offers, and interactions based on consumer preferences, AI-powered personalization improves customer satisfaction and retention, reinforcing AI's role in engagement strategies (Huang et al., 2024).

Beyond personalization, AI-enhanced gamification strategies further drive engagement by incorporating reward mechanisms, interactive challenges, and immersive experiences. AI-driven gamification features, such as adaptive challenges and real-time feedback, have been found to boost motivation, participation, and brand loyalty (Cigdem et al., 2024). Additionally, AI-powered customer service applications, including virtual assistants and conversational AI, enhance engagement by offering instant, data-driven responses and fostering seamless brand interactions (Rivera & Garden, 2021). These technologies not only improve response efficiency but also personalize user experiences, increasing customer satisfaction and deepening brand relationships. However, the effectiveness of AI-driven engagement strategies depends on trust, transparency, and perceived control. While AI automates interactions and streamlines processes, concerns about data privacy, algorithmic bias, and the lack of human-like empathy pose potential barriers to sustained engagement (Jami Pour et al., 2021). Businesses must balance AI automation with human touchpoints to maintain authenticity and trust in customer interactions. Ethical AI design, emphasizing explainability, fairness, and consumer-centricity, is essential for fostering positive AI-driven engagement experiences (Malik et al., 2025).

The SOR model further explains how AI stimuli act as external triggers that influence internal cognitive and emotional responses, ultimately leading to behavioral engagement. Both functional (usability) and emotional (passion) AI features contribute to consumer decision-making and sustained brand engagement. However, the effectiveness of AI-driven engagement is mediated by perceived interactivity and relative advantage, which shape long-term consumer experiences (Fakhfakh et al., 2024). AI-powered service robots, for instance, improve engagement through perceived friendliness, competence, and safety, positively influencing customer attitudes (Hlee et al., 2023). Similarly, AI-powered personalized recommendations (AI-PPRs) enhance engagement on platforms like Douyin by aligning content with consumer preferences, reducing search time, and increasing purchase intentions (Ding et al., 2024). While AI-driven personalization fosters engagement, privacy concerns appear to have minimal impact, as users prioritize personalization benefits over potential risks (Teepapal, 2025). Additionally, AI interactivity and personalization facilitate real-time communication and tailored recommendations, with higher technological adaptability further strengthening customer engagement (Gao et al., 2023).

H2: AI stimuli positively influence customer engagement

3.3. Moderating Role of Customer Ability Readiness

Customer ability readiness potentially moderates the relationship between AI stimuli, gamification in marketing, and customer engagement by influencing how effectively consumers interact with these technologies. Ability readiness, which encompasses a consumer's skill, confidence, and familiarity with digital interfaces, determines whether AI-driven experiences and gamified marketing efforts enhance engagement or create barriers to participation (Gao et al., 2023). In the context of AI stimuli, perceived interactivity and personalization play a crucial role in fostering customer engagement by delivering tailored, dynamic experiences (Teepapal, 2025). However, the extent to which these AI features drive engagement depends on customer ability readiness. Consumers with high readiness are better equipped to navigate AI-driven systems, allowing them to benefit more from intelligent recommendations and automated interactions. Conversely,

those with lower ability readiness may perceive AI as complex or impersonal, potentially reducing engagement and limiting the effectiveness of AI-driven marketing efforts (Gao et al., 2023).

Similarly, in gamification marketing, elements such as rewards, leaderboards, and adaptive challenges are designed to enhance motivation and participation (Hlee et al., 2023). Yet, their impact on engagement may vary based on customer ability readiness. Users who are comfortable with technology are more likely to engage with gamified experiences and perceive them as enjoyable and rewarding. In contrast, those with lower ability readiness may find gamified interactions overwhelming or difficult to navigate, leading to disengagement or frustration (Ding et al., 2024). Given this potential moderating effect, businesses must design AI-driven and gamified marketing strategies that accommodate varying levels of customer ability readiness. Providing intuitive interfaces, offering guidance for less tech-savvy users, and personalizing experiences based on user proficiency can enhance engagement across diverse consumer segments. Ultimately, the success of AI and gamification strategies in marketing is shaped not only by technological innovation but also by consumers' ability to effectively interact with these digital tools.

H3: Customer ability readiness moderates the relationship between gamification in marketing and customer engagement, with higher readiness leading to stronger engagement

H4: Customer ability readiness moderates the relationship between AI stimuli and customer engagement, such that higher ability readiness strengthens engagement

3.4. Theoretical Framework

The research framework for this study is grounded in the Stimulus-Organism-Response (SOR) model, which explains how external stimuli trigger cognitive and emotional responses, ultimately leading to behavioral engagement (Figure 1). In this study, Gamification in Marketing and AI Stimuli serve as the external stimuli (S), Customer Engagement represents the response (R), and Customer Ability Readiness acts as a moderating factor influencing the relationship between these variables. Gamification in marketing enhances engagement by incorporating game-like elements such as rewards, challenges, and competition, which motivate customers to interact with brands (Elwakeel et al., 2025). Meanwhile, AI stimuli, including personalized recommendations and predictive analytics, optimize customer experiences by tailoring interactions based on user preferences (Teepapal, 2025). The effectiveness of these stimuli varies among consumers, depending on their ability readiness—those with higher technological proficiency are more likely to benefit from AI-driven personalization and gamification, whereas those with lower readiness may struggle, leading to lower engagement levels (Gao et al., 2023). Thus, the research framework hypothesizes that gamification in marketing and AI stimuli positively influence customer engagement, with customer ability readiness moderating these relationships. Understanding this interaction is crucial for businesses, particularly in the Saudi telecommunications sector, where digital transformation under Vision 2030 is driving innovation in customer engagement strategies (Habib et al., 2025).

3.5. Research Gap

While research highlights the impact of AI stimuli and gamification in marketing on customer engagement, the moderating role of customer ability readiness remains underexplored, particularly in the Saudi telecommunications sector (Gao et al., 2023; Teepapal, 2025). Existing studies focus on developed economies, overlooking regional differences in digital adoption (Ding et al., 2024). Additionally, the integration of AI-driven gamification in telecom marketing lacks empirical evidence (Elwakeel et al., 2025). Addressing these gaps will provide insights into how customer ability readiness influences engagement, aligning with Saudi Vision 2030's digital transformation goals (Habib et al., 2025).

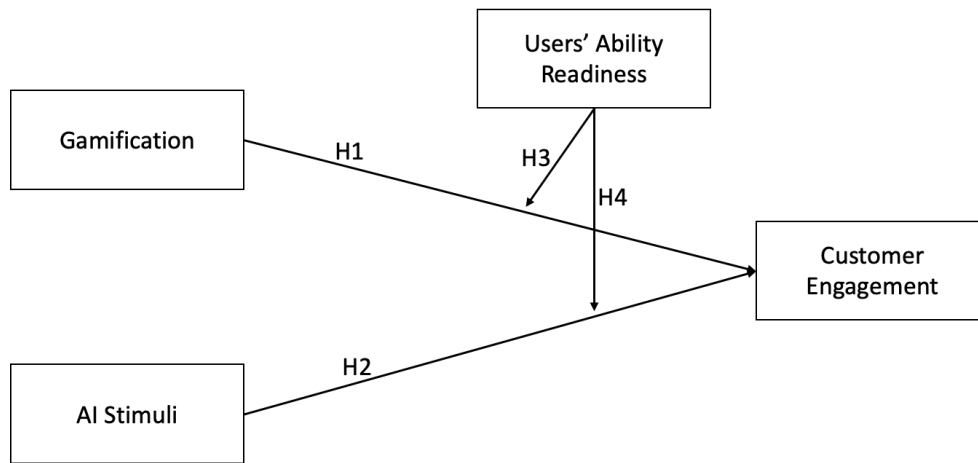


Figure 1. Theoretical framework.

4. Methodology

This study employs a quantitative research design to examine the impact of gamification in marketing and AI stimuli on customer engagement, with customer ability readiness as a moderating factor. A survey-based approach was adopted to collect primary data from customers in the Saudi telecommunications sector. The research follows a deductive approach, utilizing a structured questionnaire to measure key constructs. Data analysis was conducted using Structural Equation Modeling (SEM) to test the relationships between variables and evaluate the moderating effect of customer ability readiness.

The study's measurement model was developed using established scales from previous research, with all items assessed on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Gamification in marketing was measured based on the scale developed by Elwakeel et al. (2025), assessing perceived enjoyment, motivation, interactivity, and reward effectiveness. AI stimuli were measured using the framework of Fakhfakh et al. (2024), focusing on consumer perceptions of AI-driven personalization, interactivity, and automation. Customer ability readiness was evaluated following the model proposed by Gao et al. (2023), measuring an individual's skill, confidence, and familiarity with digital technologies that influence their interaction with AI and gamification strategies. Customer engagement was adapted from Gao et al. (2023), incorporating behavioral, cognitive, and emotional dimensions, such as interaction frequency, brand loyalty, and advocacy.

A non-probability purposive sampling technique was employed to target Saudi telecom customers who have interacted with AI-driven marketing and gamification strategies. The sample size was determined using Cohen's (1988) power analysis, ensuring statistical power for Structural Equation Modeling (SEM). A total of 400 valid responses were collected through an online survey, distributed via telecom service providers and social media platforms. The respondents represented a diverse mix of age groups, education levels, and digital proficiency, reflecting the broader consumer base in the Saudi telecommunications sector.

5. Results

Table 1 provides an overview of the demographic characteristics of the respondents. The sample consists of 55% males and 45% females, ensuring a balanced representation of gender. In terms of age distribution, the largest group falls within the 25–34 age range (37.5%), followed by 35–44 years (25.0%), indicating a predominance of young and middle-aged consumers. Regarding education level, 55% of respondents hold a bachelor's degree, while 22.5% have a master's degree, suggesting that the sample is relatively well-educated. Additionally, 47.5% of respondents reported moderate digital proficiency, with 40% indicating a high level, which is essential for understanding engagement with AI-driven and gamified marketing strategies. These characteristics highlight the suitability of the sample for examining the influence of AI stimuli and gamification on customer engagement, particularly in the technologically evolving Saudi telecommunications sector.

Table 1. Demographics of participants.

Category	Sub-category	Frequency	Percent
Gender	Male	220	55.0
	Female	180	45.0
Age	18 – 24 years	80	20.0
	25 – 34 years	150	37.5
	35 – 44 years	100	25.0
	45+ years	70	17.5
Education	High school or below	60	15.0
	Bachelor's Degree	220	55.0
	Master's Degree	90	22.5
	Doctorate Degree	30	7.5
Digital Proficiency	Low	50	12.5
	Moderate	190	47.5
	High	160	40.0

Table 2 presents the reliability and validity assessment of the study's measurement model using factor loading values, Cronbach's Alpha (α), Composite Reliability (CR), and Average Variance Extracted (AVE). The results indicate strong internal consistency and construct validity across all variables. The study's measurement model was developed using established scales from previous research, with all items assessed on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Gamification in marketing was measured based on the scale developed by Elwakeel et al. (2025), assessing perceived enjoyment, motivation, interactivity, and reward effectiveness. AI stimuli were measured using the framework of Fakhfakh et al. (2024), focusing on consumer perceptions of AI-driven personalization, interactivity, and automation. Customer ability readiness was evaluated following the model proposed by Gao et al. (2023), measuring an individual's skill, confidence, and familiarity with digital technologies that influence their interaction with AI and gamification strategies. Customer engagement was adapted from Gao et al. (2023), incorporating behavioral, cognitive, and emotional dimensions, such as interaction frequency, brand loyalty, and advocacy.

For Gamification in Marketing (Gam), factor loadings range from 0.74 to 0.83, with Cronbach's Alpha (0.87), CR (0.88), and AVE (0.65) all exceeding the recommended thresholds. Similarly, AI Stimuli (AI) shows high reliability, with factor loadings between 0.76 and 0.85, Cronbach's Alpha (0.88), CR (0.89), and AVE (0.67). These results confirm that AI-related items effectively measure the construct and contribute significantly to engagement. For Users' Ability Readiness (UAR), the factor loadings range from 0.77 to 0.82, with Cronbach's Alpha (0.85), CR (0.86), and AVE (0.63), demonstrating satisfactory internal consistency and reliability. Lastly, Customer Engagement (CE) reports strong factor loadings (0.79 to 0.86), with Cronbach's Alpha (0.89), CR (0.90), and AVE (0.69), confirming its robustness in measuring engagement levels. All reliability indicators meet or exceed accepted statistical standards: Cronbach's Alpha coefficient ($\alpha > 0.70$), composite reliability ($CR > 0.70$), and Average Variance Extracted ($AVE > 0.50$) are superior to the reference values. Furthermore, according to the HTMT ratio of correlations (Henseler et al., 2015), the constructs demonstrate adequate discriminant validity, reinforcing the validity of the measurement model. These findings confirm that the selected items effectively measure their respective constructs and provide a reliable basis for further analysis.

Table 3 assesses discriminant validity using the Fornell-Larcker criterion. Discriminant validity ensures that each construct in the model is distinct and measures what it is intended to measure. This is confirmed when the square root of the Average Variance Extracted (AVE) for each construct is greater than its correlations with other constructs in the model. The diagonal values in the table represent the square roots of AVEs, while the off-diagonal values indicate the inter-construct correlations. For the construct AI Stimuli, the square root of AVE is 0.757, which is higher than its correlations with Customer Engagement (0.592), Gamification (0.486), and User Ability Readiness (0.588). This suggests that AI Stimuli is a distinct construct with satisfactory discriminant validity. Similarly, Customer Engagement has a square root of AVE value of 0.793, which exceeds its correlations with AI Stimuli (0.592), Gamification (0.586), and User Ability Readiness (0.437), confirming its uniqueness in the model. In the case of Gamification, the square root of AVE is 0.768, which is greater than its correlations with AI Stimuli (0.486), Customer Engagement (0.586), and User Ability Readiness (0.535). This also confirms that Gamification is a distinct and reliable construct. Lastly, User Ability Readiness shows a square root of AVE of 0.825, which is higher than its correlations with all other constructs, indicating strong discriminant validity.

Table 2. Reliability and consistency.

Items	Factor Loading	Cronbach's Alpha (α)	CR	AVE
<i>Gamification in Marketing (Gam)</i>		0.87	0.88	0.65
Gam1	0.78			
Gam2	0.81			
Gam3	0.76			
Gam4	0.83			
Gam5	0.75			
Gam6	0.8			
Gam7	0.79			
Gam8	0.77			
Gam9	0.74			
Gam10	0.82			
Gam11	0.79			
Gam12	0.76			
<i>AI Stimuli (AI)</i>		0.88	0.89	0.67
AI1	0.82			
AI2	0.85			
AI3	0.78			
AI4	0.8			
AI5	0.77			
AI6	0.83			
AI7	0.79			
AI8	0.81			
AI9	0.76			
AI10	0.84			
AI11	0.78			
<i>Users' Ability Readiness (Uar)</i>		0.85	0.86	0.63
Uar1	0.79			
Uar2	0.82			
Uar3	0.77			
Uar4	0.8			
<i>Customer Engagement (CE)</i>		0.89	0.90	0.69
CE1	0.84			
CE2	0.86			
CE3	0.79			
CE4	0.82			

Table 3. Discriminant validity (Fornell-larcker criterion).

	AI Stimuli	Customer Engagement	Gamification	User Ability Readiness
AI Stimuli	0.757			
Customer Engagement	0.592	0.793		
Gamification	0.486	0.586	0.768	
User Ability Readiness	0.588	0.437	0.535	0.825

Table 4 presents the results of the structural model assessment, focusing on path coefficients and hypothesis testing. The values include beta coefficients (β), standard deviations, t-statistics, and p-values. All paths show significant relationships with Customer Engagement as the dependent variable, and all proposed hypotheses (H1 to H4) are supported based on the statistical outcomes. The direct path from Gamification to Customer Engagement has a beta value of 0.542, with a t-statistic of 4.12 and a p-value of 0.00. This indicates a strong and statistically significant positive effect, supporting H1. It suggests that gamification strategies significantly enhance customer engagement in the context of this study. The path from AI Stimuli to Customer Engagement also shows a positive and significant relationship, with a beta of 0.419, a t-statistic of 4.091, and a p-value of 0.00, thereby supporting H2. This means that exposure to AI-driven stimuli positively influences how customers interact and engage. Additionally, the interaction effect between User Ability Readiness and Gamification on Customer Engagement yields a beta of 0.406, t-statistic of 4.853, and p-value of 0.00. This supports H3, indicating that the effectiveness of gamification in driving engagement is enhanced when users are more ready and capable of using the system. Lastly, the interaction between User Ability Readiness and AI Stimuli shows a significant moderating effect with a beta of 0.415, a t-statistic of 5.228, and a p-value of 0.00. This supports H4, implying that users with higher readiness levels experience greater engagement when exposed to AI stimuli.

Table 4. Path coefficients.

Paths	Beta	Standard deviation	T statistics	P values	Results
Gamification -> Customer Engagement	0.542	0.107	4.12	0.00	H1 supported
AI Stimuli -> Customer Engagement	0.419	0.102	4.091	0.00	H2 supported
User Ability Readiness x Gamification -> Customer Engagement	0.406	0.124	4.853	0.00	H3 supported
User Ability Readiness x AI Stimuli -> Customer Engagement	0.415	0.128	5.228	0.00	H4 supported

6. Discussion

This study examines the direct and moderating effects of gamification in marketing and AI stimuli on customer engagement in the Saudi telecommunications sector, with a particular focus on the role of customer ability readiness. The results support H1, indicating that gamification has a significant positive impact on customer engagement. Incorporating game elements such as points, rewards, and interactive challenges enhances engagement by fostering intrinsic and extrinsic motivation. This aligns with Elwakeel et al. (2025), who emphasize that gamification enhances consumer interaction by creating enjoyable and rewarding experiences. Similarly, Huang et al. (2024) highlight that gamification fosters emotional connections with brands, increasing long-term loyalty and repeated engagement. However, the success of gamification strategies depends on user adaptability, as Gao et al. (2023) suggest that technological proficiency significantly influences gamified experiences. Therefore, while gamification is an effective tool for engagement, it must be tailored to different levels of digital literacy to maximize its impact. The results also support H2, demonstrating that AI stimuli positively influence customer engagement. AI-driven personalization, including predictive analytics, chatbots, and tailored recommendations, enhances customer experiences by improving service efficiency and interaction quality. This finding is consistent with Fakhfakh et al. (2024), who argue that AI-driven marketing enhances perceived value and engagement by delivering context-aware and adaptive experiences. Moreover, Teepapal (2025) emphasizes that AI-powered personalization fosters engagement by reducing cognitive effort and improving decision-making processes. However, while AI improves customer experiences, its effectiveness depends on trust and perceived interactivity, as excessive automation may lead to reduced emotional connection with brands.

The findings further support H3, indicating that customer ability readiness significantly moderates the relationship between gamification and customer engagement. Consumers with higher technological proficiency are more likely to interact effectively with gamified marketing strategies, resulting in stronger engagement levels. This aligns with Gao et al. (2023), who suggest that customer readiness determines the effectiveness of gamified systems, particularly in digital environments. Similarly, Hlee et al. (2023) argue that user adaptability influences engagement with AI-driven and gamified content, reinforcing the need for inclusive and accessible digital experiences. Additionally, the results confirm H4, revealing that customer ability readiness moderates the relationship between AI stimuli and engagement. Consumers with higher ability readiness engage more effectively with AI-driven personalization, while those with lower readiness may struggle with automated interactions, leading to reduced engagement. These findings align with Gao et al. (2023) and Teepapal (2025), who highlight the importance of designing user-friendly AI interfaces to maximize engagement across diverse consumer segments.

The study's findings contribute to the broader objectives of Saudi Vision 2030, which emphasize digital transformation and innovation-driven economic growth. The Saudi telecommunications sector is at the forefront of AI-driven marketing and gamification strategies, making it a critical industry for understanding the evolving dynamics of customer engagement. As businesses continue to integrate AI and gamification, ensuring adaptability, accessibility, and personalization will be essential for maximizing engagement and enhancing consumer-brand relationships.

7. Conclusion

This study examined the impact of gamification in marketing and AI stimuli on customer engagement, with customer ability readiness as a moderating factor in the Saudi telecommunications sector. The findings confirm that both gamification and AI-driven personalization positively influence customer engagement,

reinforcing the role of interactive and AI-powered strategies in shaping modern consumer experiences. Moreover, the results highlight that customer ability readiness significantly moderates these relationships, indicating that consumers with higher technological proficiency engage more effectively with AI and gamified marketing strategies. These insights contribute to the broader objectives of Saudi Vision 2030, which emphasize digital transformation and innovation-driven economic growth. As Saudi telecom companies continue integrating AI and gamification, designing adaptive and inclusive digital marketing strategies will be critical to sustaining engagement and enhancing customer-brand relationships.

8. Theoretical Contribution

This study extends the Stimulus-Organism-Response (SOR) model by demonstrating that customer ability readiness moderates the effects of gamification and AI stimuli on engagement. While prior research has established the direct impact of gamification and AI-driven personalization on engagement, this study introduces technological adaptability as a crucial moderating factor, providing a more nuanced understanding of digital engagement behaviors. Additionally, this research contributes to gamification and AI literature by contextualizing these strategies within the Saudi telecom sector, an area previously underexplored in emerging market studies.

9. Managerial Implications

For Saudi telecom companies, the findings suggest that gamification and AI-driven personalization can significantly enhance customer engagement, particularly when tailored to consumer readiness levels. Companies should design gamification mechanics that appeal to users with varying digital proficiency, ensuring inclusive engagement. Additionally, AI-powered personalization should be transparent and user-friendly, fostering trust and accessibility for consumers with lower ability readiness. Marketers should also prioritize adaptive strategies, such as customizable gamification experiences and AI-driven recommendations, to accommodate different engagement preferences. Furthermore, as Saudi Arabia advances its digital economy, telecom firms should leverage AI-enhanced gamification to differentiate their services, enhance customer loyalty, and align with Vision 2030's emphasis on technological innovation.

10. Limitation and Future Research

This study has several limitations. First, it focuses exclusively on the Saudi telecommunications sector, limiting the generalizability of findings to other industries or regions. Future research should expand the scope to diverse sectors to assess the broader applicability of AI and gamification strategies. Second, the study employs a cross-sectional design, capturing consumer behavior at a single point in time. Longitudinal studies could examine engagement trends over time, particularly as the novelty effect of gamification may decline. Additionally, while this study investigates customer ability readiness as a moderator, future research could explore other moderating factors, such as cultural influences or AI trust perceptions, to further refine engagement models. Expanding research to cross-cultural comparisons could provide deeper insights into how consumer ability and technological adaptation shape engagement across different digital markets.

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