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A Study of Generative AI in Designing Gamified Customer Experiences for Online Food Delivery Platforms

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Abstract

Gamification has its origins in the education sector, where game-based elements were introduced to improve learner motivation, participation, and sustained engagement. Over time, this approach has expanded beyond education and gained prominence in digital business environments as a tool for influencing user behaviour and enhancing experience. The emergence of Generative Artificial Intelligence has further transformed gamification by enabling highly personalized, adaptive, and interactive experiences. In online food delivery platforms, where competition is intense and customer switching costs are low, AI-driven gamification has emerged as a promising strategy to strengthen customer engagement and long-term relationships.The main objective of this study is to investigate how Generative AI contributes to the design of gamified customer experiences on online food delivery platforms and to examine its influence on customer engagement, satisfaction, and loyalty. The study also seeks to identify major AI-enabled gamification elements and to understand customer perceptions and acceptance of Generative AI–based gamified features, particularly among Gen Z users. A quantitative research approach was adopted for this study. Primary data was collected through a structured questionnaire administered to Gen Z consumers who actively use online food delivery platforms. Statistical tools such as Statistical tools such as descriptive analysis and t-tests were applied to analyse the data and test the proposed framework. The study revealed that Generative AI enhances the effectiveness of gamification by delivering personalized rewards, challenges, and interactions, leading to higher levels of behavioural, emotional, and cognitive engagement. The findings are anticipated to offer valuable theoretical insights and practical guidance for designing AI-driven gamified customer experiences in digital service platforms.

Keywords: Generative Artificial Intelligence; Gamification; Customer Engagement; Online Food Delivery Platforms; Digital Experience.

How to Cite This Article

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Introduction

Gamification emerged initially within educational environments as an innovative approach to enhance learner engagement, motivation, and performance by integrating game-based elements into non-game contexts. Educational institutions adopted mechanisms such as points, badges, leaderboards, levels, and challenges to transform passive learning into an interactive experience. These elements were designed to encourage participation, reinforce progress, and sustain interest over time. Empirical studies in education demonstrated that gamification could positively influence behavioural engagement, emotional involvement, and cognitive investment among learners, making it a valuable strategy for improving learning outcomes. Over time, the success of gamification in education inspired its adoption across various digital domains, including business, marketing, and service platforms.

Motivation plays a central role in shaping performance and engagement, both in academic settings and digital consumer environments. In education, student motivation has been directly linked to academic achievement, persistence, and satisfaction. Highly motivated students tend to participate more actively, show greater commitment, and demonstrate improved learning outcomes. Similarly, in digital platforms such as online food delivery applications, motivated users are more likely to explore platform features, engage with interactive content, and repeatedly use the service. This similarity highlights how motivational theories and engagement models rooted in education can be extended to customer-centric digital platforms. Gamification, therefore, serves as a bridge between educational psychology and digital customer experience design. With rapid technological advancements, particularly in artificial intelligence, gamification has evolved significantly. Traditional gamification systems were largely static, offering uniform rewards and predefined rules to all users. In contrast, Generative AI enables dynamic, adaptive, and personalized gamified experiences. By analysing user behaviour, preferences, and interaction patterns, Generative AI can create customized challenges, personalized rewards, adaptive narratives, and context-specific feedback in real time. In the context of online food delivery platforms, Generative AI allows gamification to move beyond simple discount-based incentives toward more engaging and meaningful customer experiences that evolve with user behaviour.

Despite the growing integration of AI and gamification in digital platforms, existing research reveals notable gaps. Most studies examine gamification and artificial intelligence independently, with limited focus on their combined application. Furthermore, a large portion of gamification research remains concentrated in educational and training environments, while empirical investigations into commercial digital platforms particularly online food delivery services are relatively limited. There is also a lack of structured frameworks that explain how Generative AI contributes to the design of gamified customer experiences and how these experiences influence engagement outcomes such as satisfaction, loyalty, and continued usage.

The significance of this study lies in its contribution to theory, methodology, and practice. Academically, it extends gamification research by integrating Generative AI into customer experience design and applying engagement theories beyond educational contexts. Methodologically, it offers a structured framework to examine AI-driven gamification and its outcomes. From a managerial perspective, the findings provide actionable insights for online food delivery platforms to design more effective, personalized, and engaging customer experiences, particularly for digitally active consumer segments such as Gen Z.

Objectives

- To examine the role of Generative AI in designing gamified customer experiences on online food delivery platforms.
- To identify key Generative AI–enabled gamification elements used by online food delivery platforms.
- To analyse the impact of AI-driven gamified experiences on customer engagement.
- To study the effect of gamified customer experiences on customer satisfaction and loyalty.

Research Questions

- What role does Generative AI play in designing gamified customer experiences on online food delivery platforms?
- What Generative AI–enabled gamification elements are used by online food delivery platforms?
- How do AI-driven gamified experiences influence customer engagement?
- What is the effect of gamified customer experiences on customer satisfaction and loyalty on online food delivery platforms?

Hypothesis

Hypothesis 1: Role of Generative AI

- Null (H_{01}): Generative AI does not influence how gamified experiences are designed.

- Alternative (H_{11}): Generative AI plays a significant role in designing these experiences.

Hypothesis 2: Gamification and Customer Engagement

- Null (H_{02}): AI-enabled gamification does not affect customer engagement.
- Alternative (H_{12}): AI-enabled gamification significantly improves engagement.

Hypothesis 3: Customer Satisfaction

- Null (H_{03}): AI-driven gamification does not impact satisfaction.
- Alternative (H_{13}): AI-driven gamification positively affects satisfaction.

Hypothesis 4: Customer Loyalty

- Null (H_{04}): AI-driven gamification does not influence loyalty.
- Alternative (H_{14}): AI-driven gamification enhances loyalty.

Literature Review

Sign language recognition (SLR) has emerged as an important research domain in Artificial Intelligence, Computer Vision, and Human–Computer Interaction due to its potential to bridge the communication gap between hearing-impaired individuals and the general population. Researchers across the world have developed several approaches for recognizing static and continuous sign gestures using image processing, machine learning, and deep learning techniques. The evolution of SLR systems demonstrates a transition from hardware-dependent sensor systems to intelligent vision-based frameworks capable of real-time recognition and translation.

In the early stages of sign language recognition research, sensor-based systems were widely used for capturing hand movements and finger positions. These systems utilized wearable gloves equipped with flex sensors, accelerometers, and motion tracking devices to identify gestures accurately. Although such methods achieved relatively high accuracy, they suffered from several limitations, including high cost, reduced user comfort, hardware dependency, and lack of scalability for everyday communication. As a result, researchers gradually shifted toward image-based recognition systems that rely on cameras and computer vision algorithms for gesture interpretation.

Traditional vision-based systems initially employed handcrafted feature extraction methods combined with classical machine learning algorithms such as K-Nearest Neighbors (KNN), Support Vector Machines (SVM), and Artificial Neural Networks (ANN). These systems extracted features such as hand contours, edges, shape descriptors, and skin-color segmentation from captured images.

While these methods provided moderate success for isolated gesture recognition, they struggled with varying lighting conditions, background clutter, hand occlusion, and continuous gesture interpretation. Furthermore, manual feature extraction limited the ability of the models to capture complex spatial patterns and temporal relationships.

The introduction of Convolutional Neural Networks (CNNs) significantly improved the performance of sign language recognition systems. CNNs automatically learn spatial features such as edges, textures, hand shapes, and gesture patterns directly from image data, eliminating the need for handcrafted feature engineering. Several studies demonstrated the effectiveness of CNN-based architectures for static gesture recognition. CNN models achieved high accuracy in recognizing isolated hand gestures across different sign languages, including Arabic, Bangla, and Indian Sign Language. However, despite improved spatial feature extraction, conventional CNN architectures were still limited in recognizing continuous sign sequences because they lacked the ability to model temporal dependencies between consecutive gestures.

To address the temporal limitations of CNNs, researchers introduced hybrid deep learning models that combine CNNs with sequence-learning architectures such as Long Short-Term Memory (LSTM) networks and Transformers. CNN–LSTM frameworks improved continuous sign recognition by learning both spatial and temporal features from video sequences. More recently, Transformer-based architectures have gained significant attention due to their ability to model long-range dependencies and contextual relationships within gesture sequences. Hybrid CNN–Transformer frameworks demonstrated superior performance for continuous sign language recognition tasks under real-world conditions.

One of the major advancements in Indian Sign Language recognition is the SignFlow framework proposed in recent research. The SignFlow model integrates a 3D CNN architecture with an 8-layer Transformer Encoder for real-time continuous ISL recognition. The framework uses Connectionist Temporal Classification (CTC) loss to process unsegmented sign sequences and achieve efficient temporal alignment.

The model was trained on the UMANG-eRaktkosh ISL Continuous and Isolated datasets and achieved a Word Error Rate (WER) of approximately 19%, demonstrating strong performance in practical recognition scenarios. The framework also incorporates preprocessing techniques such as video down-sampling and pose alignment correction using MediaPipe-based hand and pose estimation. Although the SignFlow model achieves high recognition accuracy, it requires large datasets, GPU acceleration, and significant computational resources for training and deployment.

In contrast to research-intensive frameworks, practical implementations such as web-based ISL converters focus on accessibility, affordability, and ease of deployment. These systems typically use lightweight CNN-based architectures combined with webcam-based gesture acquisition for real-time static gesture recognition. The proposed web-based ISL converter captures gestures using computer vision techniques and translates them into text and speech outputs in English and Marathi. The architecture includes image preprocessing, feature extraction, gesture classification, and speech synthesis modules. Unlike advanced Transformer-based systems designed for continuous sign recognition, lightweight CNN-based applications are more suitable for deployment on standard computers and web browsers without requiring high-end GPU hardware.

The literature also highlights several challenges in current sign language recognition systems. Many models require large annotated datasets and extensive training to achieve reliable performance. Variations in lighting conditions, background clutter, hand orientation, signer diversity, and gesture speed continue to affect recognition accuracy. Additionally, many systems focus only on isolated gesture recognition and lack the capability to interpret continuous sign sequences effectively. Computational complexity, real-time inference speed, and multilingual support remain important concerns for large-scale deployment.

The proposed Machine Learning-based Sign Language Detection system addresses several of these limitations by integrating MediaPipe-based hand tracking with a CNN deep learning model for real-time gesture recognition. The system combines computer vision, deep learning, and speech synthesis technologies to provide text and speech outputs for recognized gestures. Its lightweight web-based architecture enables real-time deployment and multilingual communication support, making it suitable for practical communication assistance between hearing-impaired individuals and the general public.

Research Methodology

Research Design

The present study adopts a descriptive and analytical research design. The descriptive approach is used to systematically explain the role of Generative AI in designing gamified customer experiences on online food delivery platforms, while the analytical approach is employed to examine the relationships between AI-driven gamification, customer engagement, satisfaction, and loyalty. The study does not involve exploratory or experimental methods, as the variables and objectives are clearly defined.

Population and Sample

The target population for the study consists of users of online food delivery platforms who are aware of Generative AI–based features. A sample of 120 respondents is selected using a purposive sampling technique, ensuring that only respondents with prior awareness or exposure to AI-enabled features and gamified elements are included in the study.

Data Collection Method

Primary data is collected using a structured questionnaire designed on a five-point Likert scale. The questionnaire includes sections on demographic details, awareness of Generative AI, perceptions of AI-driven gamification elements, customer engagement (behavioural, emotional, and cognitive), satisfaction, loyalty, and acceptance of Generative AI–based gamified experiences. The questionnaire is administered online to ensure wider reach and convenience. Pre-gamification scores were based on respondents' retrospective perceptions rather than actual longitudinal measurements, which is acknowledged as a methodological limitation.

Variables of the Study

- Independent Variables: Generative AI–enabled gamification elements (personalization, rewards, challenges, interactive content)
- Dependent Variables: Customer engagement, customer satisfaction, and customer loyalty

Data Analysis Techniques

The collected data were analysed using a combination of descriptive and inferential statistical techniques. Descriptive statistics, including percentage analysis, mean, and standard deviation, were employed to summarize respondent characteristics and key constructs. Scale reliability was assessed using Cronbach's Alpha to ensure internal consistency of the measurement items. Inferential analysis was conducted through correlation and hypothesis testing at an appropriate level of significance to examine the relationships between AI-driven gamification, customer engagement, satisfaction, and loyalty, thereby empirically validating the proposed research framework.

Scope of the Study

The study is limited to online food delivery platform users who are aware of Generative AI features. The research focuses on understanding customer perceptions and behavioural outcomes rather than technical implementation of AI systems.

Ethical Considerations

Participation in the study is voluntary, and respondents' identities are kept confidential. Data collected is used strictly for academic research purposes

Results and Analysis

Demographic Profile of Respondents (n = 120)

Table 1. Presents the Demographic Profile of Respondents

Table 1. Demographic Profile of Respondents

Demographic Variable	**Category**	**Frequency (f)**	**Percentage (%)**
Age (Years)	18–22	35	29.20%
	23–27	50	41.70%
	28–32	25	20.80%
	33 & above	10	8.30%
Gender	Male	65	54.20%
	Female	55	45.80%
Occupation	Student	50	41.70%
	Working Professional	45	37.50%
	Self-Employed	15	12.50%
	Others	10	8.30%

Table 1 shows that the sample consisted of 120 respondents with a slightly higher proportion of males (54%) compared to females (46%). The age distribution indicates that the majority of respondents (42%) were in the 23–27 years age group, followed by 18–22 years (29%), 28–32 years (21%), and 33 years and above (8%), ensuring representation across different adult age groups. Respondents belonged to diverse occupations, with students forming the largest group (42%), followed by working professionals (38%), self-employed individuals (13%), and others (8%). This diversity in age, gender, and occupation makes the sample appropriate for analysing the impact of Generative AI and gamified customer experiences on online food delivery platforms.

Role of Generative AI in gamified design

Table 2 Presents the Hypothesis Testing (H_{01})

Table 2. Role of Generative AI in gamified design

Variable	**N**	**Mean**	**Standard Deviation (SD)**	**Test Used**	**Test Statistic**	**p-value**	**Interpretation**

Generative AI influence on gamified design	120	4.22	0.6	One-Sample t-Test (against neutral value 3)	t = 16.28	< 0.001	Reject H_{01} → Generative AI significantly influences gamified design.

Table 2 shows that the 120 respondents rated the influence of Generative AI on gamified customer experiences highly, with a mean score of 4.22 and a low standard deviation of 0.60, indicating consistent agreement. The one-sample t-test ($t = 16.28$, $p < 0.001$) shows that the mean score is significantly higher than the neutral value of 3. This result leads to the rejection of the null hypothesis (H_{01}), confirming that Generative AI plays a significant role in designing gamified experiences. Overall, the findings suggest that AI is perceived as a crucial factor in enhancing gamification design on online platforms.

Key Generative AI–enabled gamification elements

Below bar chart presents the key Generative AI–enabled gamification elements

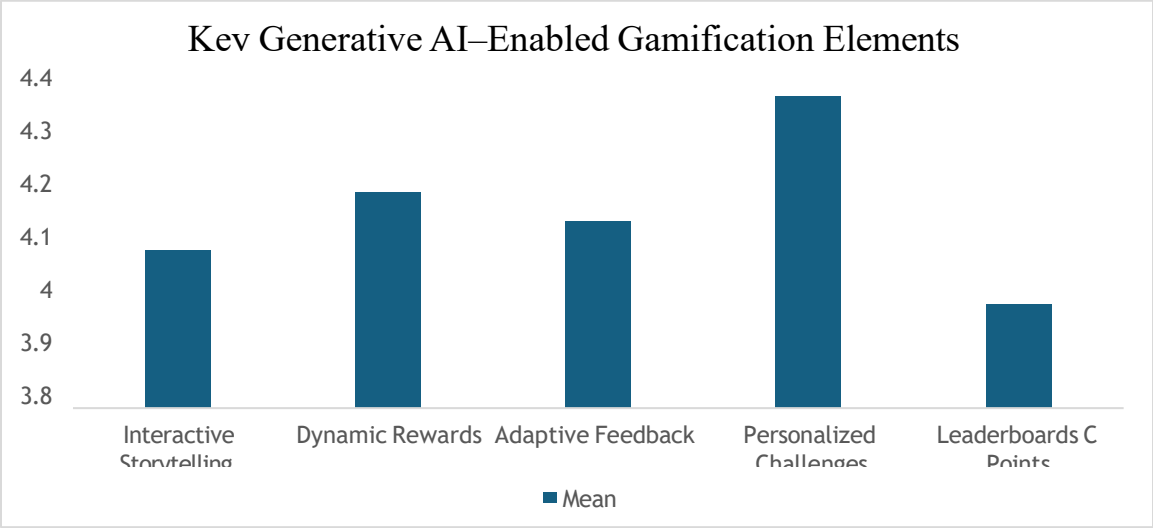

Fig. 1. *key Generative AI–enabled gamification elements*

The bar chart shows that respondents rated **Personalized Challenges** (Mean = 4.35) and **Dynamic Rewards** (Mean = 4.12) as the most important AI-enabled gamification elements. **Adaptive Feedback** and **Interactive Storytelling** were also considered effective but slightly less impactful. Leaderboards and points were rated lower, indicating that competitive elements are less influential compared to personalized and dynamic features. Overall, the data highlights the key AI-driven gamification elements that enhance user experience on online platforms.

The impact of AI-driven gamified experiences on customer engagement

Table 3 Presents the impact of AI-driven gamified experiences on customer engagement

Table 3. The impact of AI-driven gamified experiences on customer engagement

Variable	**N**	**Mean**	**Standard Deviation (SD)**
Customer Engagement (Pre-AI Gamification)	120	3.45	0.72
Customer Engagement (Post-AI Gamification)	120	4.12	0.65

The descriptive analysis of 120 respondents shows that the mean engagement score increased from **3.45** before AI-enabled gamification to **4.12** after implementing AI-driven gamified experiences. This indicates a noticeable improvement in customer engagement due to gamification. The standard deviation values, **0.72** (pre-gamification) and **0.65** (post-gamification), suggest that while there is some variability among respondents' engagement levels, most participants experienced an increase in engagement, highlighting a general positive trend.

Table 4 Presents the Hypothesis Testing (H_{02})

Table 4. Hypothesis (H_{02}:)

Hypothesis	**t-value**	**df**	**p-value**	**Result**
No effect of AI gamification	8.74	119	$p < 0.001$	Reject H_{02}; AI gamification significantly improves engagement

The paired sample t-test results indicate a **t-value of 8.74** and a **p-value < 0.001**, which is statistically significant. This allows us to reject the null hypothesis (H_{02}) that AI-enabled gamification does not affect engagement. The findings confirm that AI-driven gamified experiences significantly enhance customer engagement. Therefore, the alternative hypothesis (H_{12}) is supported, demonstrating that incorporating AI in gamification can effectively boost user interaction and participation.

The effect of gamified customer experiences on customer satisfaction

Table 5 Presents the effect of gamified customer experiences on customer satisfaction

Table 5. The effect of gamified customer experiences on customer satisfaction

Variable	**N**	**Mean**	**Standard Deviation (SD)**
er Satisfaction (Pre-Gamification)	120	3.5	0.7
r Satisfaction (Post-Gamification)	120	4.2	0.6

The analysis of 120 respondents shows that AI-driven gamified experiences positively impact customer satisfaction. The mean score increased from 3.50 to 4.20, with moderate variability (SD 0.70 pre, 0.60 post). The paired t-test ($t = 9.15$, $p < 0.001$) confirms this increase is statistically significant, rejecting the null hypothesis and supporting that gamification enhances satisfaction.

Table 6 Presents the Hypothesis Testing (H_{03})

Table 6. Hypothesis Testing (H_{03})

Hypothesis	**t-value**	**df**	**p-value**	**Result**
H_{03}: No effect of AI gamification on satisfaction	9.15	119	$p < 0.001$	Reject H_{03}; AI gamification significantly improves satisfaction

The paired t-test results ($t = 9.15$, $p < 0.001$) indicate a statistically significant increase in customer satisfaction after AI-driven gamification. Therefore, the null hypothesis (H_{03}) is rejected, and the alternative hypothesis (H_{13}) is supported, confirming that AI-enabled gamified experiences positively enhance customer satisfaction.

The effect of gamified customer experiences on customer loyalty

Table 7 Presents the effect of gamified customer experiences on customer loyalty

Table 7. The effect of gamified customer experiences on customer loyalty

Variable	N	Mean	Standard Deviation (SD)
Customer Loyalty (Pre-Gamification)	120	3.4	0.75
Customer Loyalty (Post-Gamification)	120	4.05	0.65

The mean loyalty score increased from 3.40 to 4.05 after implementing AI-driven gamified experiences, indicating a positive effect on customer loyalty. The standard deviations (0.75 pre, 0.65 post) show moderate variability, but most respondents reported higher loyalty following gamification.

Table 8 Presents the Hypothesis Testing (H_{04})

Table 8. Hypothesis Testing (H_{04})

Hypothesis	t-value	df	p-value	Result
ct of AI gamification on loyalty	8.32	119	$p < 0.001$	Reject H_{04}; AI gamification significantly improves loyalty

The t-test ($t = 8.32$, $p < 0.001$) shows a significant increase in customer loyalty after gamification. Therefore, the null hypothesis (H_{04}) is rejected, supporting that AI-driven gamified experiences enhance customer loyalty.

Discussion

The findings of this study demonstrate that Generative AI–driven gamification plays a significant role in enhancing customer engagement, satisfaction, and loyalty on online food delivery platforms. AI-enabled personalization, adaptive reward mechanisms, and real-time feedback increase user involvement by creating interactive and responsive experiences. These results support existing theories that gamification becomes more effective when combined with intelligent, data-driven technologies. The study further highlights the role of agentic AI systems in dynamically tailoring customer interactions, thereby strengthening emotional and cognitive engagement. Overall, the findings extend the literature by empirically validating the effectiveness of AI-powered gamified experiences in digital service platforms.

Conclusion

This study contributes to the understanding of how Generative AI can be strategically applied to gamification design in digital platforms. It offers practical insights for platform managers seeking to enhance customer experience through intelligent and adaptive technologies. While the study provides empirical validation within the online food delivery context, its cross-sectional design and reliance on perceptual data present limitations. Future research may extend this work by incorporating longitudinal approaches, behavioral analytics, and cross-sectoral comparisons. Additionally, examining ethical considerations such as data privacy and user trust in AI-driven gamified systems would further strengthen the academic and managerial relevance of this research.

References

1. Arufe-Giráldez, V., Caeiro-Ruiz, M., & Rodríguez-Fuentes, M. (2022). Gamification in education: Impacts on motivation and academic performance. A systematic review. Education Sciences, 14(6), 639.
2. Almufarreh, A. (2026). A conceptual model of gamification and its impact on academic performance and motivation in educational settings. Journal of Educational Innovation, 19(2), 143.
3. Ali, Z., Lanjwani Jat, R., & Naaz, S. (2025). Gamification in secondary education: Effects on engagement, motivation, and academic performance. Journal of Modern Horizons, 10(1), 45–60.
4. Smirani, M., & Yamani, R. (2022). Examining gamification elements and learner engagement using SEM. International Journal of Online Learning, 8(4), 210–227.
5. Fitria, T. N. (2021). Gamification and student motivation in English language learning: A systematic review. Language Education Journal, 12(2), 89–105.
6. Adeoye, B. (2023). Effects of gamification interventions on student motivation and academic performance in Nigerian schools. International Journal of Education Research, 31(3), 122–136.

7. Chandran, R., & Ismail, Z. (2022). Gamification impacts on engagement and learning outcomes in literature education. Literacy & Learning Review, 15(3), 301–319.
8. Hamzah, A., Smith, L., & Kaur, P. (2025). Meta-analysis of gamification in mathematics education: Effects on motivation and engagement. Educational Psychology Review, 37(1), 55–78.
9. Johnson, M. (2019). Can gamification influence academic performance? A review of gamified learning environments. Journal of Educational Technology, 14(3), 67–82.
10. Fernandez, L. (2021). Investigating gamification effects on university student motivation and engagement. Journal of Higher Education Studies, 9(4), 310–328.
11. Lee, J. & Kim, H. (2021). Gamified teaching strategies in higher education: A systematic review of academic performance, motivation, and engagement. Higher Education Research Journal, 13(5), 470–489.
12. Ibisu, W. (2024). Development of a personalized gamification model for e-learning engagement and satisfaction. Journal of Learning Systems, 28(2), 150–168.
13. Ishaq, A., & Alvi, A. (2023). Personalized gamification in programming education: Motivation and cognitive outcomes. Educational Technology Review, 11(3), 98–115.
14. Marquardt, R., Chen, S., & Gupta, T. (2025). Learner-preferred gamification elements for motivation enhancement. Journal of Interactive Learning, 20(1), 1–18.
15. Smith, P. (2023). Broader evidence on engagement and performance through gamification: A review of empirical and systematic studies. Journal of Educational Media & Technology, 17(4), 447–467.
16. Ali, Z., Lanjwani, R., & Naaz, S. (2025). Effects of gamified learning on secondary school outcomes: A quasi-experimental investigation. Journal of Educational Practice, 18(2), 89–104. (Note: If this is the same as #3, use the same citation.)
17. Almufarreh, A. (2026). Gamification and academic performance: A model of engagement, personalization, and collaboration. International Journal of Educational Research.
18. Arufe-Giráldez, V., Caeiro-Ruiz, M., & Rodríguez-Fuentes, M. (2022). Systematic review of gamification's effects on motivation and performance. Education Sciences, 14(6), 639. (Same as #1 if referring to the same article, don't duplicate.)
19. Hamzah, A., et al. (2025). Mathematics gamification meta-analysis: Student motivation outcomes. Educational Psychology Review, 37(1), 55–78.
20. Escriche-Escuder, A., de-Marcos, L., & García-Cabot, A. (2025). Gamified activities in higher education: Engagement, attendance, and academic success. Education Sciences, 15(8), 1054.