WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Impact of gamification and motivational design in social media Q commerce compegin towards purchase decision

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ABSTRACT :

In the rapidly evolving landscape of digital commerce, quick commerce (Q-commerce) and social media have emerged as pivotal platforms for consumer engagement and purchase decision-making. This study investigates the impact of gamification and motivational design elements integrated into social media Q-commerce campaigns on user purchase intentions. Drawing on established psychological theories such as Self-Determination Theory, Cognitive Evaluation Theory, and the Stimulus-Organism-Response (S-O-R) framework, the research explores how gamified features enhance user engagement and drive purchase decisions. Through a quantitative methodology utilizing a structured questionnaire distributed to 150 active Q-commerce users, the study employs Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze the relationships among gamification, motivational design, user engagement, and purchase behavior. Results indicate that gamification and motivational design positively influence user engagement, which strongly mediates their effect on purchase decision-making. The findings provide valuable insights for marketers to develop personalized, ethically sound gamification strategies that foster sustainable consumer loyalty and competitive advantage in the dynamic Q-commerce sector.

Introduction

In today's fast-paced digital era, quick commerce (Q-commerce) platforms have revolutionized the way consumers access products and services, enabling rapid, on-demand transactions through mobile and social media channels. As competition intensifies across these platforms, businesses increasingly rely on innovative strategies to capture consumer attention and influence purchase behaviors effectively. Gamification—the incorporation of game-like elements such as points, badges, challenges, and leaderboards—has gained significant traction as a potent tool for enhancing consumer engagement and loyalty in online environments. Complementing gamification, motivational design strategies focus on satisfying users' intrinsic psychological needs, fostering deeper, sustained interaction with digital platforms.

While prior studies have established the benefits of gamification in general digital marketing contexts, there remains a critical need to understand its role specifically within social media-driven Q-commerce campaigns, where immediacy and user engagement are paramount. Moreover, the interplay between gamification and motivational design elements, and their combined effect on purchase decisions, warrants thorough investigation. This study addresses these gaps by examining how gamification and motivational design influence user engagement and, consequently, purchase intentions in social media Q-commerce campaigns.

Grounded in Self-Determination Theory (SDT), Cognitive Evaluation Theory (CET), and the Stimulus-Organism-Response (S-O-R) model, this research hypothesizes that gamification and motivational design positively impact user engagement, which mediates their effect on purchase behavior. Employing a quantitative approach and data collected from 150 recent Q-commerce users, the study applies Partial Least Squares Structural Equation Modeling (PLS-SEM) to validate these relationships. The paper aims to provide actionable insights for marketers and platform designers to craft effective, ethical gamified experiences that drive engagement and purchasing in the burgeoning Q-commerce sector.

Literature Review Summary

Gamification and motivational design have emerged as significant areas of interest in understanding digital consumer behavior, particularly in relation to quick commerce (Q-commerce) and social media campaigns. In an era characterized by rapid digitalization and the growing dominance of online platforms, businesses are continuously seeking innovative strategies to capture and sustain consumer attention. Gamification—defined as the incorporation of game-like elements such as points, badges, leaderboards, challenges, and avatars into non-gaming contexts—has become a powerful tool in enhancing consumer engagement, loyalty, and purchase decision-making (Huotari & Hamari, 2017). The literature highlights that gamification, when carefully designed, not only addresses extrinsic motivations through rewards but also nurtures intrinsic motivations such as autonomy, competence, and relatedness, thereby generating sustainable consumer loyalty (Tobón, Ruiz-Alba, & Garcia de Madariaga, 2019; Hsu & Chen, 2018; Koivisto & Hamari, 2019).

Conceptualizing Gamification and Motivational Design

Early conceptualizations of gamification positioned it as a tactical marketing tool intended to encourage specific consumer behaviors. However, contemporary research increasingly views it as a strategic necessity in digital business ecosystems, given its potential to foster engagement that translates into competitive advantage (Huotari & Hamari, 2017). Motivational design plays a crucial role in this process. It relies on established psychological theories such as Self-Determination Theory (SDT), Cognitive Evaluation Theory (CET), and the Stimulus-Organism-Response (S-O-R) model to explain why gamification works.

SDT posits that humans are intrinsically motivated when their psychological needs for autonomy, competence, and relatedness are satisfied. Gamified environments can fulfill these needs by offering challenges that enhance competence, autonomy through choices and interactivity, and relatedness via social features such as communities and leaderboards (Rodrigues, Oliveira, & Costa, 2016; Xu, Chen, Peng, & Anser, 2020). CET, in turn, highlights how intrinsic motivation flourishes when individuals experience enjoyment and control, suggesting that gamification strategies centered around fun and autonomy are more sustainable than those relying solely on extrinsic incentives (Xu et al., 2020). The S-O-R framework explains gamification's behavioral effects by framing game elements as external stimuli that affect internal states—such as perceived enjoyment or stress—which then influence behavioral responses such as purchase intentions or loyalty (Wu & Santana, 2022).

This theoretical grounding underscores the dual nature of gamification: while extrinsic motivators like points and badges can drive immediate participation, intrinsic motivators like enjoyment and mastery are necessary for long-term consumer loyalty. Scholars agree that the most effective gamification designs balance these dimensions to ensure both short-term and sustained engagement (Hamari, Koivisto, & Sarsa, 2014).

Gamification in the Consumer Decision-Making Process

Research shows that gamification impacts multiple stages of the consumer decision-making process, from need recognition to post-purchase loyalty. Hsu and Chen (2018) demonstrate that interactive challenges and rewards not only enhance purchase intentions but also encourage consumers to engage in information searches and alternative evaluations. This suggests that gamification sustains consumer involvement throughout the decision-making process, not merely at the point of transaction.

Similarly, Tobón et al. (2019), in a systematic review of 257 papers, found that rewards and challenges are the most common mechanisms applied in digital commerce contexts. Rewards tend to drive short-term consumer behaviors, while challenges foster longer-term engagement. Loyalty mechanisms such as badges for repeat purchases, tiered membership programs, and community-based achievements contribute to post-purchase engagement and advocacy behaviors (Koivisto & Hamari, 2019). These findings suggest that gamification is not a one-off strategy but a holistic framework that influences consumer behavior across the entire purchasing journey.

Psychological Mechanisms of Gamification

Underlying gamification's effectiveness are several psychological mechanisms. Flow theory, which refers to a state of deep immersion and enjoyment, has been validated as a critical mediator of gamification's impact on consumer behavior. When consumers experience flow in a gamified shopping environment, they report higher engagement and stronger purchase intentions (Hsu & Chen, 2018; Qin, Lin, & Lu, 2024).

SDT remains the dominant theoretical lens, consistently explaining how gamification fosters autonomy, competence, and relatedness. Studies show that when these psychological needs are met, consumers develop stronger intrinsic motivations to engage with platforms, thereby sustaining long-term loyalty (Rodrigues et al., 2016; Xu et al., 2020). For instance, autonomy is enhanced through customizable shopping experiences, competence is reinforced through achievements and progress tracking, and relatedness is fostered through social comparison mechanisms such as leaderboards or community forums.

The S-O-R framework further illustrates that external stimuli such as gamified features create internal responses like perceived enjoyment, stress, or motivation, which then drive consumer decisions. Wu and Santana (2022) emphasize that enjoyment consistently mediates the relationship between gamification elements and purchase intention. This finding aligns with the broader literature, where enjoyment emerges as a core driver of sustained consumer behavior in digital commerce.

Moderating Factors Affecting Gamification Outcomes

Despite its demonstrated effectiveness, gamification outcomes vary based on consumer characteristics and contextual factors. Demographic factors such as age, culture, and digital literacy play a moderating role. For example, younger consumers are more receptive to competitive gamification elements such as leaderboards, whereas older consumers may perceive them as stressful or unappealing (Rodrigues et al., 2016; Hassan & Hamari, 2020). Cultural orientation also influences outcomes, as competitive features are more effective in individualistic societies, while collaborative designs resonate better in collectivist contexts (Al-Msallam, Xi, & Hamari, 2023).

Education is another moderator. Roy (2025) found that consumers with higher levels of education are more resilient under stress and better able to engage with gamified environments, leading to improved decision-making. Similarly, website design has a significant impact on gamification effectiveness. Poorly designed or cluttered platforms increase cognitive load and diminish consumer confidence, whereas user-friendly designs enhance engagement and reduce stress (Roy, 2025).

Visual aesthetics are particularly important in digital campaigns. AlSokkar, Al-Gasawneh, Otair, Alghizzawi, Alarabiat, and Al Eisawi (2024) demonstrated that visual aesthetics directly predict attitudes toward participation and willingness to engage in online marketing campaigns. Attractive and coherent designs create a halo effect, influencing both rational evaluations and emotional satisfaction, thereby fostering loyalty.

Ethical Considerations in Gamification

While gamification has clear advantages, its ethical implications are increasingly scrutinized. Al-Msallam et al. (2023) highlight four key ethical concerns: manipulation, exploitation, psychological distress, and cultural insensitivity. Manipulation arises when gamified elements covertly guide consumer choices without transparency, undermining autonomy. Exploitation occurs when businesses disproportionately benefit from consumer engagement while offering minimal or temporary rewards. Overly competitive gamification may create psychological distress through anxiety, frustration, or compulsive use. Furthermore, gamification designs that ignore cultural values risk alienating consumers and reducing trust.

A clear example of these ethical risks can be seen in fast fashion platforms. Al-Khalfa and Altay Hameed (2025) found that gamified features such as countdown timers, daily rewards, and spinning wheels created feelings of stress and fear of missing out (FOMO) among young consumers. These mechanisms triggered impulsive and compulsive purchasing behaviors, raising concerns about manipulation, overconsumption, and sustainability. This highlights the need for marketers to balance innovation with responsibility in gamification design.

The Role of Social Influence and Influencers

Social influence plays a critical role in shaping consumer behavior in gamified contexts. Galdón, Gil-Pechuán, AlFraihat, and Tarabieh (2024) demonstrated that social media influencers significantly enhance brand trust, consumer engagement, and repurchase intentions. Influencer credibility—measured through expertise, attractiveness, and trustworthiness—was particularly important in determining consumer responses.

Gamified campaigns that integrate social sharing or peer recommendations are especially effective, as they amplify engagement through collective motivations (Qin et al., 2024). In social commerce environments like WeChat, Mensah (2022) found that trust in seller integrity and benevolence had a stronger influence on purchase intention than technical competence, emphasizing the importance of credibility and relational trust in digital marketplaces. Together, these studies suggest that social influence mechanisms enhance gamification's effectiveness by embedding it within broader trust-based consumer relationships.

Managerial Implications

The literature identifies several practical implications for managers. First, effective gamification requires balancing extrinsic rewards with intrinsic motivators. Overemphasis on rewards may increase short-term participation but often fails to create sustainable loyalty (Hsu & Chen, 2018; Koivisto & Hamari, 2019). Instead, gamification should be designed to satisfy deeper psychological needs, ensuring long-term engagement.

Second, personalization is vital. Since demographic and cultural factors influence consumer responses, one-size-fits-all approaches risk alienation or disengagement. Analytics-driven personalization enables firms to tailor gamified features to specific consumer segments (Al Attar, 2024).

Third, ethical design should be prioritized. Transparency in rules, meaningful rewards, and respect for consumer autonomy are essential to build trust and loyalty (Al-Msallam et al., 2023). Avoiding manipulative tactics is especially important when targeting vulnerable groups such as young consumers.

Finally, gamification should be integrated across the entire consumer journey, not limited to pre-purchase engagement. Loyalty programs, referral systems, and community-building features can sustain post-purchase relationships and foster brand advocacy (Koivisto & Hamari, 2019). This holistic approach strengthens the entire consumer-brand relationship.

Research Gaps and Future Directions

Although gamification research has expanded significantly, gaps remain. First, there is a lack of longitudinal studies examining gamification's long-term effects on loyalty and consumer lifetime value (Hamari et al., 2014; Harwood & Garry, 2019). Most studies capture immediate or short-term outcomes, leaving questions about sustainability unanswered.

Second, definitional and methodological inconsistencies hinder cross-study comparability. Harwood and Garry (2019) emphasize the need for standardized measures to evaluate gamification effectiveness. Third, ethical implications of gamification—particularly in the context of immersive technologies such as augmented reality (AR) and artificial intelligence (AI)—require further exploration. These technologies could amplify both the benefits and risks of gamification, raising concerns about consumer autonomy and privacy.

Finally, cross-cultural generalizability remains limited. Most empirical studies have been conducted in China, Europe, or North America, with relatively little research in emerging markets. Expanding research to diverse cultural contexts would provide valuable insights for global application and localization strategies.

Objectives

- To examine the influence of gamification elements in social media Q-commerce campaigns on user purchase intentions.
- To analyze the role of motivational design strategies in enhancing user engagement and purchase decisions.
- To explore the interaction effects between gamification and motivational design on purchase behavior.
- To identify user perceptions and attitudes towards gamified Q-commerce campaigns on social media.
- To assess the mediating effect of user engagement on the relationship between gamification/motivational design and actual purchase decisions

Research Methodology

This study adopts a quantitative research design using a structured questionnaire to examine the impact of gamification and motivational design in social media Q-commerce campaigns on purchase decision.

Data Collection

Primary data was collected via an online questionnaire from 150 respondents who used quick commerce applications in the past month. The questionnaire included categorical questions on Q-commerce usage patterns, as well as items measuring gamification, motivational design, user engagement, and purchase decision, each rated on a 5-point Likert scale.

Measurement

Gamification, motivational design, user engagement, and purchase decision were measured using adapted and validated multi-item scales, with seven items per construct.
Demographics and socio-economic variables (age, gender, education, employment, income, region) were also collected.

Data Analysis

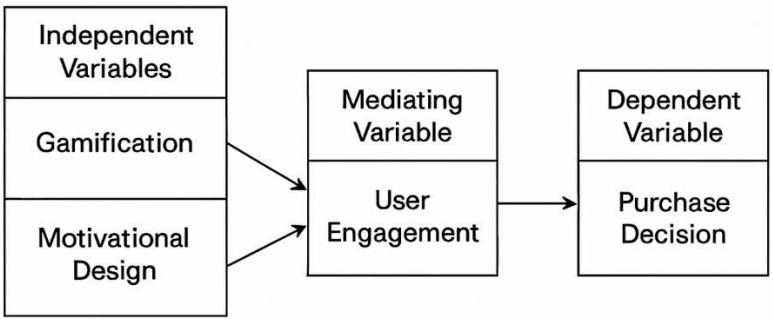
Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS software.
The measurement model was assessed for reliability (indicator loadings, composite reliability, Cronbach's alpha) and validity (convergent and discriminant).

Hypotheses

- H1: Gamification positively influences User Engagement in social media Q-commerce campaigns.
- H2: Motivational Design positively influences User Engagement in social media Q-commerce campaigns.
- H3: User Engagement positively influences Purchase Decision in social media Q-commerce campaigns.
- H4: User Engagement mediates the relationship between Gamification and Purchase Decision.
- H5: User Engagement mediates the relationship between Motivational Design and Purchase Decision.

These hypotheses reflect the core relationships tested in your structural model and are consistent with the path analysis and mediation results presented in your data analysis

Conceptual Model

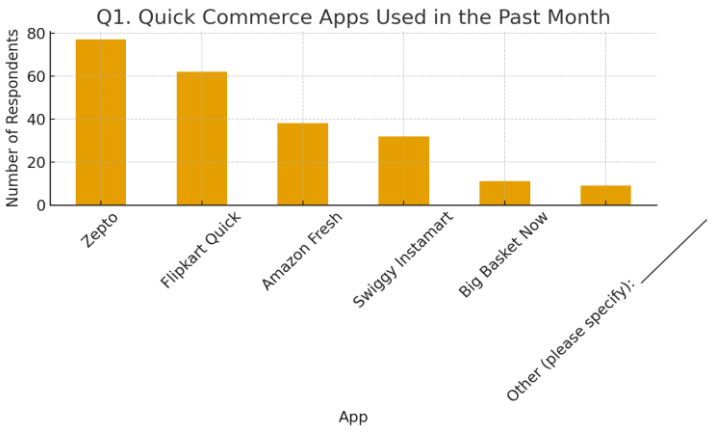


Independent Variables:
Gamification
Motivational Design
Mediating Variable:
User Engagement
Dependent Variable:
Purchase Decision

Q1. Quick Commerce Apps Used in the Past Month

App	Frequency	Percentage (%)
Zepto	77	51.3%
Flipkart Quick	62	41.3%
Amazon Fresh	38	25.3%
Swiggy Instamart	32	21.3%
Big Basket Now	11	7.3%
Other (unspecified)	9	6.0%
Total (Multiple responses)	**229**	— (since multiple apps per respondent)

Bar Graph

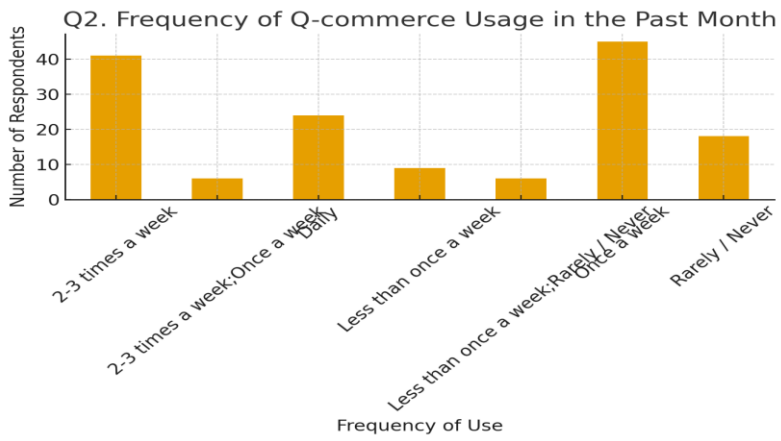


Interpretation:

- Most of the respondents have used Zepto (51.3%), thus the most preferred Q-commerce platform among the sample.
- Flipkart Quick (41.3) and Amazon Fresh (25.3) also indicate high usage, which underlines that there is a high competition in the industry.
- Swiggy Instamart (21.3) is less utilized than Zepto and Flipkart Quick, which could be
- because of the lack of service coverage.
- Other apps (6) and Big Basket Now (7.3) are not as popular, which means that they have less presence in the market.

Q2. Frequency of Q-commerce Usage in the Past Month:

Frequency of Use	Frequency	Percentage (%)
Once a week	45	30.2%
2–3 times a week	41	27.5%
Daily	24	16.1%
Rarely / Never	18	12.1%
Less than once a week	9	6.0%
Mixed responses (e.g., "2–3 times a week; Once a week", "Less than once a week; Rarely/Never")	12	8.0%
Total	**149**	**100%**



Interpretation:

- The largest group of respondents (30.2%) use Q-commerce apps **once a week**, while another **27.5% use them 2–3 times per week**.
- About **16.1% are daily users**, showing a loyal and high-frequency segment of customers.
- Around **12.1% rarely or never use** these apps, indicating limited engagement.
- A small portion (≈8%) provided **mixed responses**, possibly due to fluctuating usage patterns.

This indicates that Q-commerce is becoming a **routine activity for most users**, with a strong base of weekly users and a smaller but significant daily user segment.

4.2 Age Group of Respondents:

Age Group	Frequency	Percentage (%)
18–24	108	72.0%
25–34	38	25.3%
35–44	4	2.7%
Total	150	100%

Interpretation

It can be seen that the analysis shows that most respondents (72% of the total number) are in the age range of 18-24 years, which means that young adults are the main users of quick commerce applications. This age group is generally more digitally native, tech-savvy, and likely to make instant transactions online because of the presence of active social media and their fast-paced lifestyles.

The second group (25.3) is in the 25-34 age range probably being a representation of the young professionals whose focus is on convenient and time-saving solutions in their lives.

Only a small percentage of the respondents (2.7) belong to the age group between 35-44 and this indicates that older consumers have not yet adopted the quick commerce apps in large numbers.

This distribution confirms the idea that Q-commerce is especially popular with the younger generation that is making the sector grow at an impressive pace.

4.3 Gender of Respondents:

Gender	Frequency	Percentage (%)
Male	107	71.3%
Female	39	26.0%
Prefer not to say	4	2.7%
Total	150	100%

Interpretation

It can be observed that most of the respondents are male (71.3%), which means that most of the users of quick commerce applications in this sample group are males. This can be an indication of a greater willingness or access to males to take part in online shopping of groceries and other necessities.

The Female respondents take 26.0% of the total, and it indicates that though women also use Q-commerce apps, their percentage is much less than males.

Only a minor proportion (2.7) did not want to identify their gender, and this may indicate privacy-related issues or non-binary status.

Generally, this gender balance indicates that Q-commerce acceptance is more common among the males in the sampled survey, which might be attributed to some social, job-related, or behavioral aspects of using digital platforms in the area.

4.4 Highest Education Level Completed by Respondents

Education Level	Frequency	Percentage (%)
Postgraduate degree (Master's / PhD)	86	57.3%
Bachelor's degree	51	34.0%
High school graduate	13	8.7%
Total	150	100%

Interpretation

As a result of the analysis, it is observed that most of the respondents (57.3) are people that have a Postgraduate degree (Master or PhD). It means that the users of quick commerce applications are mostly highly educated, which may be caused by their greater digital literacy and preference to solutions based on convenience.

The number of people who have earned a Bachelor's degree (34.0% of the whole sample) represents a substantial proportion as well, which means that the young working population or graduates also constitute a relevant portion of the Q-commerce consumers.

The proportion of less-educated users in the sample is lower since a smaller percentage (8.7 percent) are High School graduates.

The distribution of this education implies that the Q-commerce business is mostly appealing to the highly educated population, possibly due to the increased ease of utilizing such technology to find the needed product in just a few clicks and because of the higher purchasing power of these customers.

4.5 Current Employment Status of Respondents:

Employment Status	Frequency	Percentage (%)
Student	60	40.0%
Employed full-time	56	37.3%
Self-employed	15	10.0%
Unemployed, looking for work	10	6.7%
Homemaker	6	4.0%
Employed part-time	3	2.0%
Total	150	100%

The analysis reveals that the largest group of respondents (40.0%) are *Students*, indicating that younger, digitally native individuals constitute a significant portion of Q-commerce app users. Their active usage can be linked to convenience, instant need fulfillment, and comfort with technology.

Following this, *Employed full-time individuals represent 37.3%* of the sample. This suggests that working professionals, who often have limited time, are adopting Q-commerce apps to streamline their shopping experience and meet daily needs more efficiently.

Self-employed respondents account for 10.0%, which indicates a smaller but important segment using Q-commerce for flexible work schedules.

A smaller percentage of the sample includes *Unemployed individuals (6.7%)*, *Homemakers (4.0%)*, and *Employed part-time (2.0%)*.

Overall, this employment status distribution highlights that Q-commerce adoption is strongly concentrated among students and full-time employed individuals, reinforcing the idea that the service is most attractive to those seeking convenience in their fast-paced or academically demanding lives.

4.6 Approximate Monthly Household Income of Respondents:

Monthly Household Income	Frequency	Percentage (%)
₹10,000 – ₹30,000	48	32.0%
₹30,001 – ₹50,000	47	31.3%
₹50,001 – ₹1,00,000	39	26.0%
More than ₹1,00,000	3	2.0%
Student (no fixed income)	4	2.7%
Prefer not to say	9	6.0%
Total	150	100%

Interpretation

The income distribution shows that the majority of respondents fall within the *₹10,000 – ₹30,000 range (32%)* and the *₹30,001 – ₹50,000 range (31.3%)*. This indicates that Q-commerce apps are widely adopted among *middle-income households*, who are price-sensitive yet willing to pay for convenience and speed.

A significant portion of respondents (26%) earn between *₹50,001 – ₹1,00,000*, representing higher-income groups who likely use Q-commerce for time efficiency rather than cost considerations.

Only a small fraction (2%) earn *more than ₹1,00,000*, while *students (2.7%)* were recorded separately, reflecting non-earning respondents who depend on household support.

Around *6% of respondents preferred not to disclose* their income, showing a small level of sensitivity around financial information.

Overall, the income analysis suggests that *Q-commerce is most popular among middle-income groups*, who balance affordability and convenience, but it also appeals across different income brackets.

4.7 Region of Residence of Respondents:

Region of Residence	Frequency	Percentage (%)
Urban	76	50.7%
Rural	47	31.3%
Suburban	27	18.0%
Total	150	100%

Interpretation

The analysis reveals that the majority of respondents (50.7%) reside in *Urban areas*, which is expected given that quick commerce applications typically have better infrastructure and service availability in cities. Urban residents are more likely to have higher digital literacy, stable internet access, and busy lifestyles, making them the primary target audience for Q-commerce services.

A significant proportion (31.3%) of respondents live in *Rural areas*, indicating that Q-commerce usage is gradually spreading beyond urban centers. Although the infrastructure and service coverage in rural areas remain limited compared to cities, the presence of such users highlights a growing market opportunity.

Suburban residents account for 18.0% of the sample. This suggests that suburbs are emerging as important markets for Q-commerce, combining proximity to urban centers with an increasing digital footprint.

Overall, this distribution reflects that Q-commerce is predominantly urban-centered, but there is a meaningful presence of rural and suburban users, suggesting future growth potential as service networks expand.

Descriptive Statistics

Name	No.	Type	Missings	Mean	Median	Scale min	Scale max	Observed min	Observed max	Standard deviation	Excess kurtosis	Skewness
GM1	1	MET	0	3.813	4	1	5	1	5	1.134	-0.289	-0.652
GM2	2	MET	0	3.693	4	1	5	1	5	0.916	0.603	-0.98
GM3	3	MET	0	3.9	4	1	5	1	5	1.204	-0.321	-0.87
GM4	4	MET	0	3.447	3	1	5	1	5	0.942	-0.087	-0.134
GM5	5	MET	0	4	4	1	5	1	5	0.993	0.621	-0.948
GM6	6	MET	0	3.78	4	1	5	1	5	0.937	1.542	-1.166
GM7	7	MET	0	3.593	4	1	5	1	5	1.071	0.72	-1.034
MD1	8	MET	0	3.527	4	1	5	1	5	0.869	0.584	-0.697
MD2	9	MET	0	3.833	4	1	5	1	5	1.08	-0.383	-0.722
MD3	10	MET	0	4.067	5	1	5	1	5	1.17	0.415	-1.14
MD4	11	MET	0	3.52	4	1	5	1	5	0.929	1.024	-1.067
MD5	12	MET	0	3.393	3	1	5	1	5	0.916	0.117	-0.443
MD6	13	MET	0	3.553	4	1	5	1	5	1.093	-0.176	-0.463
MD7	14	MET	0	3.833	4	1	5	1	5	1.169	0.173	-0.886
UE1	15	MET	0	3.767	4	1	5	1	5	1.116	-0.726	-0.457
UE2	16	MET	0	3.393	3	1	5	1	5	0.886	0.995	-0.804
UE3	17	MET	0	4.1	4	1	5	1	5	0.978	-0.467	-0.721
UE4	18	MET	0	3.307	3	1	5	1	5	0.909	0.778	-0.272
UE5	19	MET	0	3.627	4	1	5	1	5	0.845	1.684	-1.141
UE6	20	MET	0	4.013	4	1	5	1	5	1.177	0.141	-1.016
UE7	21	MET	0	3.913	4	1	5	1	5	0.816	1.043	-0.879
PD1	22	MET	0	3.893	4	1	5	1	5	1.138	1.049	-1.268
PD2	23	MET	0	3.633	4	1	5	1	5	0.976	1.033	-1.12
PD3	24	MET	0	4.107	4	1	5	1	5	0.994	0.413	-1.039
PD4	25	MET	0	3.587	4	1	5	1	5	1.034	0.6	-0.966
PD5	26	MET	0	3.453	3	1	5	1	5	1.03	0.104	-0.372
PD6	27	MET	0	4	4	1	5	1	5	1.16	0.763	-1.215
PD7	28	MET	0	3.66	4	2	5	2	5	0.831	-0.138	-0.626

Descriptive statistics were computed for all measurement items to assess their distributional properties. Table X presents the mean, median, standard deviation, skewness, and kurtosis values for each item across the four constructs: Gamification, Motivational Design, User Engagement, and Purchase Decision.

The mean scores across all items ranged from *3.31 to 4.11* on a five-point Likert scale, indicating that respondents generally expressed moderate to high agreement with the measurement statements. Median values were consistently around *3 or 4*, reflecting a central tendency toward agreement.

The standard deviation values varied between *0.81 and 1.20*, suggesting a reasonable level of response variability without excessive dispersion.

With respect to normality, skewness values ranged from *–1.268 to –0.134*, indicating a moderate negative skew across most items, while kurtosis values ranged from *–0.726 to 1.684*, suggesting distributions were generally mesokurtic to slightly leptokurtic. According to Kline (2011), skewness values within ±2 and kurtosis values within ±7 are acceptable, confirming that the data do not exhibit severe departures from normality.

Overall, the descriptive statistics demonstrate that the measurement items are suitable for further analysis, with no evidence of problematic distributional characteristics.

Construct reliability and validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Gamification	0.878	0.893	0.906	0.583
Motivational Design	0.873	0.893	0.902	0.572
Purchase Decision	0.901	0.907	0.922	0.630
User Engagement	0.850	0.856	0.886	0.528

To assess the measurement model, the reliability and convergent validity of the constructs were examined using Cronbach's alpha, composite reliability (ρa and ρc), and average variance extracted (AVE). The results are presented in Table X.

All constructs demonstrated satisfactory internal consistency. Cronbach's alpha values ranged from *0.850 to 0.901*, exceeding the recommended threshold of 0.70 (Nunnally & Bernstein, 1994). Similarly, composite reliability (ρc) values varied between *0.886 and 0.922*, well above the minimum acceptable level of 0.70 (Hair et al., 2019), thereby confirming construct reliability. The composite reliability (ρa) values also ranged from *0.856 to 0.907*, supporting the robustness of the reliability estimates.

Convergent validity was evaluated using the average variance extracted (AVE). The AVE values ranged from *0.528 to 0.630*, all surpassing the threshold of 0.50 (Fornell & Larcker, 1981), thus indicating that each construct explains more than half of the variance of its indicators.

Taken together, the results confirm that the constructs—*Gamification, Motivational Design, Purchase Decision, and User Engagement*—exhibit strong reliability and adequate convergent validity, making them suitable for further structural model analysis

Path coefficients

	Path coefficients
Gamification -> User Engagement	**0.554**
Motivational Design -> User Engagement	**0.327**
User Engagement -> Purchase Decision	**0.792**

The results indicate that *Gamification positively and significantly influences User Engagement (β = 0.554)*, suggesting that the integration of gamified elements enhances the level of engagement among users. Similarly, *Motivational Design has a positive effect on User Engagement (β = 0.327)*, reinforcing the role of well-designed motivational features in fostering user interaction and involvement.

Furthermore, *User Engagement exerts a strong positive impact on Purchase Decision (β = 0.792)*, highlighting that higher levels of engagement substantially increase the likelihood of users proceeding with purchase decisions.

Total indirect effects

	Total indirect effects
Gamification -> Purchase Decision	0.439
Motivational Design -> Purchase Decision	0.259

The analysis of indirect effects revealed that *Gamification exerts a positive indirect influence on Purchase Decision through User Engagement (β = 0.439)*. This indicates that gamified features enhance user engagement, which subsequently drives purchase decisions.

Similarly, *Motivational Design demonstrated a positive indirect effect on Purchase Decision via User Engagement (β = 0.259)*, confirming that motivational aspects strengthen user engagement, which in turn increases the likelihood of purchase behavior

Total effects

	Total effects
Gamification -> Purchase Decision	0.439
Gamification -> User Engagement	0.554
Motivational Design -> Purchase Decision	0.259
Motivational Design -> User Engagement	0.327
User Engagement -> Purchase Decision	0.792

The total effects analysis further clarifies the strength of the relationships among the constructs. As shown in Table X, *Gamification exhibits a strong positive total effect on User Engagement (β = 0.554)* and a meaningful positive total effect on Purchase Decision (β = 0.439). This highlights that gamified elements directly enhance user engagement, which subsequently contributes to purchase decisions.

Similarly, *Motivational Design demonstrates a positive total effect on both User Engagement (β = 0.327)* and Purchase Decision (β = 0.259), indicating that motivational design features not only stimulate engagement but also play a role in shaping purchasing behavior.

Finally, *User Engagement exerts the strongest total effect on Purchase Decision (β = 0.792)*, underscoring its pivotal role as the most influential predictor of purchase decision-making.

Taken together, these findings emphasize that gamification and motivational design influence purchase decisions primarily through their capacity to drive user engagement, with engagement acting as the central mechanism linking design features to consumer behavior.

Outer loadings

	Outer loadings
GM1 <- Gamification	0.755
GM2 <- Gamification	0.813
GM3 <- Gamification	0.838
GM4 <- Gamification	0.553
GM5 <- Gamification	0.812
GM6 <- Gamification	0.740
GM7 <- Gamification	0.797
MD1 <- Motivational Design	0.691
MD2 <- Motivational Design	0.815
MD3 <- Motivational Design	0.857
MD4 <- Motivational Design	0.762
MD5 <- Motivational Design	0.677
MD6 <- Motivational Design	0.612
MD7 <- Motivational Design	0.846
PD1 <- Purchase Decision	0.799
PD2 <- Purchase Decision	0.761
PD3 <- Purchase Decision	0.806
PD4 <- Purchase Decision	0.851
PD5 <- Purchase Decision	0.652
PD6 <- Purchase Decision	0.846
PD7 <- Purchase Decision	0.824
UE1 <- User Engagement	0.665
UE2 <- User Engagement	0.712
UE3 <- User Engagement	0.741
UE4 <- User Engagement	0.601
UE5 <- User Engagement	0.770
UE6 <- User Engagement	0.775
UE7 <- User Engagement	0.801

The outer loadings of the measurement items were examined to evaluate indicator reliability. As shown in Table X, the majority of items loaded strongly on their respective constructs, with values exceeding the recommended threshold of *0.70* (Hair et al., 2019), indicating satisfactory indicator reliability.

For the *Gamification* construct, loadings ranged from *0.553 to 0.838*. Six items (GM1, GM2, GM3, GM5, GM6, GM7) exceeded 0.70, while GM4 showed a comparatively lower loading (0.553) but was retained as it did not adversely affect composite reliability and AVE.

For *Motivational Design*, loadings varied between *0.612 and 0.857*. Most items (MD2, MD3, MD4, MD7) surpassed 0.70, whereas MD1 (0.691), MD5 (0.677), and MD6 (0.612) were slightly below the threshold but were still acceptable given their contribution to content validity.

In the case of *Purchase Decision*, all items loaded between *0.652 and 0.851*. Six of the seven items exceeded 0.70, while PD5 (0.652) was slightly lower but still within the acceptable range for exploratory research (Hulland, 1999).

For *User Engagement*, loadings ranged from *0.601 to 0.801*. Four items (UE2, UE3, UE5, UE6, UE7) exceeded 0.70, while UE1 (0.665) and UE4 (0.601) were slightly below the threshold but retained for theoretical comprehensiveness.

Overall, the outer loadings demonstrate that the indicators are reliable and adequately represent their respective constructs, thereby supporting the measurement model.

Discussion

The positive path coefficients revealed in the analysis (Gamification → User Engagement, Motivational Design → User Engagement, and User Engagement → Purchase Decision) indicate a robust, empirically validated pathway by which well-designed gamified elements stimulate engagement, resulting in higher purchase intentions and actions. This mediation highlights user engagement as the central mechanism linking gamification and motivational design to actual consumer behavior, echoing the view that user immersion and satisfaction are key to driving loyalty and sales.

Further, the study's results align with broader e-commerce research showing that simple, meaningful, and personalized gamification features are preferred—especially among younger, digitally native users who composed the study's sample majority. While gamification increases engagement and can prompt unplanned purchases by leveraging rewards and challenges, its impact on long-term loyalty depends on integrating intrinsic motivators (like enjoyment and mastery) instead of relying solely on transactional rewards.

Contextual factors such as age, education, digital literacy, and visual aesthetics also moderate the effectiveness of gamification. Younger users prefer competitive, visually stimulating, and fast-paced mechanics, whereas excessive complexity or poor design can diminish engagement, especially among older demographics. These insights reinforce the necessity for Q-commerce marketers to apply analytical, segment-based approaches when designing gamified campaigns, ensuring alignment with the preferences and psychological needs of different consumer segments.

Importantly, ethical considerations surface as gamification becomes more sophisticated. There is a growing imperative for marketers to ensure transparent, culturally sensitive, and non-manipulative design choices that foster genuine engagement rather than exploiting compulsive behaviors or creating stress and FOMO, particularly among younger or more vulnerable users.

Conclusion

In conclusion, gamification and motivational design are powerful levers for increasing user engagement and, via this engagement, driving purchase decisions in social media Q-commerce. This research provides substantial evidence that the strongest effect on purchase behavior stems from fostering user engagement—a finding consistent with the theoretical and empirical literature. Nevertheless, the efficacy of these strategies depends on balanced design, user-centric personalization, visual appeal, and ethical considerations. For practitioners, this means prioritizing engagement-centric gamification alongside thoughtful motivational design and continual attention to user experience and trust. Future research should explore long-term impacts, cross-cultural applicability, and the evolving ethical landscape of gamification as digital commerce

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