

UNDERSTANDING THE ROLE OF GAMIFICATION AND LOYALTY PROGRAMS IN RESTAURANT APPS: A SYSTEMATIC LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK DEVELOPMENT

Memahami Peran Gamifikasi dan Program Loyalitas dalam Aplikasi Restoran: Sebuah Tinjauan Literatur Sistematis dan Pengembangan Kerangka Konseptual

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Abstract

The rapid digital transformation in the restaurant industry has led to the widespread adoption of mobile applications incorporating gamification, rewards, and loyalty programs to enhance customer engagement and retention. This study conducts a systematic literature review to synthesize recent research on these strategies in restaurant mobile apps. Following the PRISMA guidelines, a comprehensive search of the Scopus database identified 587 records, with 42 studies published between 2020 and 2025 meeting the inclusion criteria. Thematic analysis revealed four primary themes: (1) mechanisms of user engagement driven by motivational affordances fulfilling autonomy, competence, and relatedness needs; (2) architecture of rewards and loyalty programs evolving from transactional to digital, tiered, and personalized ecosystems; (3) outcomes on customer loyalty encompassing both attitudinal and behavioral dimensions; and (4) challenges including privacy concerns, poor design, and wellbeing implications. The findings are interpreted through Self-Determination Theory, Service-Dominant Logic, and Oliver's loyalty framework, demonstrating that gamification enhances customer experience and fosters loyalty through need satisfaction and value co-creation. Practical implications guide restaurant managers and app developers in designing layered gamification experiences, navigating personalization-privacy trade-offs, and implementing ethical engagement practices. The review identifies critical research gaps, including the need for longitudinal studies, cross-cultural comparisons, and investigations of negative outcomes. This synthesis contributes to theoretical development in digital loyalty and offers actionable insights for industry practitioners.

Keywords: Gamification; Loyalty Programs; Rewards; Mobile Applications; Customer Engagement.

Abstrak

Transformasi digital yang pesat dalam industri restoran telah menyebabkan adopsi luas aplikasi seluler yang menggabungkan gamifikasi, hadiah, dan program loyalitas untuk meningkatkan keterlibatan dan retensi pelanggan. Penelitian ini melakukan tinjauan literatur sistematis untuk mensintesis penelitian terbaru tentang strategi-strategi ini dalam aplikasi seluler restoran. Mengikuti panduan PRISMA, pencarian komprehensif pada basis data Scopus mengidentifikasi 587 catatan, dengan 42 studi yang diterbitkan antara tahun 2020 dan 2025 memenuhi kriteria inklusi. Analisis tematik mengungkapkan empat tema utama: (1) mekanisme keterlibatan pengguna yang didorong oleh motivational affordances yang memenuhi kebutuhan otonomi, kompetensi, dan keterhubungan; (2) arsitektur hadiah dan program loyalitas yang berkembang dari ekosistem transaksional menjadi digital, bertingkat, dan personal; (3) hasil pada loyalitas pelanggan yang mencakup dimensi sikap dan perilaku; dan (4) tantangan termasuk masalah privasi, desain yang buruk, dan implikasi kesejahteraan. Temuan diinterpretasikan melalui Teori Penentuan Nasib Sendiri, Logika Dominasi Layanan, dan kerangka loyalitas Oliver, yang menunjukkan bahwa gamifikasi meningkatkan pengalaman pelanggan dan menumbuhkan loyalitas melalui pemenuhan kebutuhan dan ko-kreasi nilai. Implikasi praktis memandu manajer restoran dan pengembang aplikasi dalam merancang pengalaman gamifikasi berlapis, menavigasi trade-off personalisasi-privasi, dan menerapkan praktik keterlibatan yang etis. Tinjauan ini mengidentifikasi kesenjangan penelitian yang kritis, termasuk kebutuhan akan studi longitudinal, perbandingan lintas budaya, dan investigasi hasil negatif. Sintesis ini berkontribusi pada pengembangan teoretis dalam loyalitas digital dan menawarkan wawasan yang dapat ditindaklanjuti untuk praktisi industri..

Kata Kunci: Gamifikasi; Program Loyalitas; Imbalan; Aplikasi Mobile; Keterlibatan Pelanggan.

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Introduction

The digital revolution that has engulfed the restaurant industry has significantly changed the way in which customer-brand interactions occur, making mobile applications the major tool for service delivery and customer interactions (Roy et al., 2023; Shankar et al., 2022). Gamification and digital reward programs have become the new additions in the mobile applications of restaurants, aiming at elevating customer interactions and promoting customer loyalty (Gatautis et al., 2022; Hollebeek et al., 2021; Hwang & Choi, 2020). Digital engagement tools have become the new imperative in the hyper-competitive food service industry, which has shifted from a luxury to a necessity (Dandis et al., 2024).

Gamification, or the integration of game design features in non-game settings, has become increasingly popular in the context of digital marketing and service systems in terms of motivating and engaging users (Koivisto & Hamari, 2020; Xi & Hamari, 2020). Research has shown that gamified systems increase perceived enjoyment and intrinsic motivation in the context of digital environments (Behl et al., 2024; Rodrigues et al., 2021; Sigala, 2020). In the context of mobile commerce settings, features such as points, badges, and challenges have a significant impact on behavioral intentions and loyalty development (Chakraborty et al., 2024; Hollebeek et al., 2021; Hwang & Choi, 2020).

Loyalty programs within restaurant mobile application software have experienced considerable development, from simple transactional rewards to complex gamified environments that emphasize personalization, instant feedback, and progression (Gatautis et al., 2022; Rather & Hollebeek, 2021). Research findings demonstrate that gamified loyalty programs are able to produce both hedonic (pleasure) and utilitarian (economic) value, thereby improving customer satisfaction and purchase intentions (Bravo et al., 2023; Rita et al., 2021; Su et al., 2022). Reward integration within digital channels also aids in developing switching costs and improving customer retention for service industries (Lee et al., 2024; Roy et al., 2023; Shankar et al., 2022). Recent research findings emphasize the efficacy of tiered gamified environments for the quick service industry, particularly for environments that involve numerous low-cost transactions (Kim et al., 2025).

Customer engagement has been identified as an essential explanatory factor that connects gamification and customer loyalty. As such, customer engagement refers to the cognitive, emotional, and behavioral investment in the interaction with the brand within digital environments (Islam et al., 2021; Rather et al., 2022). Gamified attributes that trigger customer engagement are those that motivate customers to actively engage in the interaction, thereby fostering deeper engagement with the brand and strengthening behavioral loyalty (Hollebeek et al., 2021; Khan et al., 2023; Xi & Hamari, 2020). In the hospitality service industry, customer engagement has been empirically linked to the improvement of customer experience and relational satisfaction (Alzahrani et al., 2023; Leclercq et al., 2020; Sigala, 2020).

Recent studies conducted in the Southeast Asian digital environment have further validated the importance of gamification and engagement in the context of mobile services. Jeremiah and Tarigan (2023) showed the importance of gamification and ease of use in influencing consumer loyalty in the context of mobile commerce. Prayudha and Tarigan (2024) showed the importance of digital engagement in influencing repurchase intention in the context of food delivery mobile applications. Furthering the discourse in the context of engagement and gamification, Sutrisno et al. (2025) showed the importance of well-structured engagement in influencing the overall user experience and behavior in the context of gamification environments.

Even though the subject of the research is in the context of education, the research provides further theoretical support for the engagement-based behavioral model in the context of restaurant mobile application environments. Further validation of the importance of the subject is shown in the research conducted by Nguyen et al. (2023).

Nevertheless, despite the increasing volume of research, there still exist some pertinent gaps that have not been addressed. For instance, the majority of existing gamification studies focus on individual gamification elements in isolation. This has created an incomplete understanding of how various motivational affordances, such as points, badges, leaderboards, and challenges, interact in delivering customer loyalty in restaurant mobile applications (Behl et al., 2024; Koivisto & Hamari, 2020; Rodrigues et al., 2021). Another pertinent gap in the existing gamification studies is the failure to integrate the psychological processes that govern the effectiveness of gamification in customer loyalty in terms of the combined effects of Self-Determination Theory constructs (autonomy, competence, and relatedness), flow experience, and emotional energy (Charry et al., 2024; Hamie et al., 2025). Third, although the shift from transactional loyalty programs to experiential loyalty programs has been recognized in the gamification studies (Bravo et al., 2023; Lee et al., 2024), the architectural design that enables the transition in the context of restaurant loyalty programs has not been explored. Fourth, emerging concerns regarding data privacy, ethical design, and consumer wellbeing in gamified systems have received limited attention in existing reviews (Akhmedova, 2024; Barari, 2024; Moriuchi et al., 2026). Fifth, longitudinal investigations examining sustained behavioral change beyond initial novelty effects are scarce (Kunkel et al., 2021; Upadhyay et al., 2024).

These gaps represent a timely and necessary area for research given the rapid digitalization of the restaurant industry and the growing prominence of mobile applications as the primary customer engagement tool. In this regard, the current research will employ a systematic literature review (SLR) to answer the following research questions:

RQ1: What are the most prevalent gamification elements and reward architectures implemented in restaurant mobile applications?

RQ2: What psychological and engagement-driven mechanisms (e.g., need satisfaction, flow experience, emotional energy) underlie the relationship between gamification and customer loyalty in this context?

RQ3: How can the findings be integrated into a comprehensive conceptual framework that explains the process of loyalty development in gamified restaurant mobile environments?

This literature review, which synthesizes the empirical research conducted between 2020 and 2025, makes a theoretical contribution and provides managerial implications for the development of successful gamified loyalty programs in restaurant mobile apps. It is informed by the theoretical perspectives of Self-Determination Theory (Ryan & Deci, 2000), Flow Theory (Csikszentmihalyi, 1990), and Service-Dominant Logic (Vargo & Lusch, 2004), which provide a framework for understanding the research results. The selection of the theories is informed by the fact that Self-Determination Theory provides insight into the psychological need satisfaction that games provide for the user, Flow Theory provides insight into the experience of flow that games provide, and Service-Dominant Logic provides a macro-level understanding of the outcome of the loyalty program in the form of co-creation of value.

Research Methods

The current research carried out a systematic literature review to analyze the existing literature on gamification, rewards, and loyalty programs in restaurant mobile apps. The systematic literature review was carried out following the PRISMA guidelines, which are the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (Page et al., 2021).

Search Strategy

The literature search was carried out in January 2026 on the Scopus database, which was chosen for its comprehensive coverage of the peer-reviewed literature in the areas of hospitality, tourism, marketing, information systems, and human-computer interaction. Scopus is generally accepted as one of the largest and most trustworthy abstract and citation databases available for academic research.

The search strategy involved the use of a combination of keywords that relate to the key concepts in the review. These keywords include gamification, rewards, loyalty schemes, mobile apps, and the restaurant industry. The use of Boolean operators such as AND and OR was involved in the combination of the keywords. The search string used in the search of the articles is as follows:

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(TITLE-ABS-KEY ("gamif*" OR "game design" OR "game element*" OR "game mechanic*")  
OR TITLE-ABS-KEY ("reward*" OR "incentive*" OR "prize*")  
OR TITLE-ABS-KEY ("loyalty program*" OR "frequent diner" OR "customer loyalty"))  
AND TITLE-ABS-KEY ("mobile app*" OR "mobile application*" OR "app" OR "smartphone app*")  
AND TITLE-ABS-KEY ("restaurant*" OR "food service" OR "dining" OR "cafe" OR "fast food" OR "quick service")
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Figure 1. the combination of the keywords

Source: Data Processed by Researchers, 2026

Inclusion and Exclusion Criteria

To guarantee the relevance and quality of the identified studies, a set of inclusion and exclusion criteria was developed before conducting the search. The criteria were intended to target recent peer-reviewed studies that specifically investigated the relationship between gamification, rewards, and loyalty programs in restaurant mobile apps.

Inclusion Criteria:

- a. Publication Period: Articles published between January 2020 and December 2025, ensuring coverage of the most recent developments in this rapidly evolving field.
- b. Document Type: Peer-reviewed journal articles and conference proceedings.
- c. Language: Articles published in English.
- d. Subject Area: Studies focusing on gamification, rewards, or loyalty programs within the context of restaurant mobile applications.
- e. Research Type: Empirical studies (quantitative, qualitative, or mixed-methods) as well as conceptual papers and systematic reviews relevant to the topic.

Exclusion Criteria:

- a. Publication Period: Articles published before 2020.
- b. Document Type: Book chapters, books, editorials, opinion pieces, notes, and industry reports without peer review.
- c. Language: Non-English articles.
- d. Relevance: Studies focusing on gamification or loyalty programs in non-restaurant contexts (e.g., retail, banking, education, healthcare) without direct application to restaurants; studies on mobile applications in restaurants without any gamification or loyalty program components.
- e. Accessibility: Articles for which full text was not available or accessible through institutional subscriptions.

Selection Process

The study selection process followed the PRISMA four-phase flow diagram (identification, screening, eligibility, and inclusion). The process was conducted independently by two reviewers to minimize bias and ensure consistency.

1. **Identification:** The initial search was executed in the Scopus database, yielding a total of 587 records. These records were exported to reference management software (e.g., Mendeley, EndNote, or Zotero) for further processing.
2. **Screening (Duplicates Removal):** Duplicate records were identified and removed using the reference management software, resulting in 523 unique records (64 duplicates removed)..
3. **Screening (Title and Abstract):** The titles and abstracts of the remaining 523 records were screened against the inclusion and exclusion criteria. A total of 278 records were excluded at this stage (85 ineligible records, 24 other exclusions, and 169 clearly irrelevant to the research topic), resulting in 245 records considered potentially relevant.
4. **Eligibility (Full-Text Assessment):** The full texts of the potentially relevant records were retrieved and thoroughly assessed for eligibility. Studies that did not meet all inclusion criteria after full-text review were excluded, with reasons documented. Common reasons for exclusion at this stage included: lack of focus on mobile applications, absence of gamification or loyalty program elements, or studies conducted in contexts not transferable to restaurants.
5. **Inclusion:** The final set of studies that met all inclusion criteria was included in the systematic review for data extraction and synthesis. This resulted in a final corpus of 42 articles.

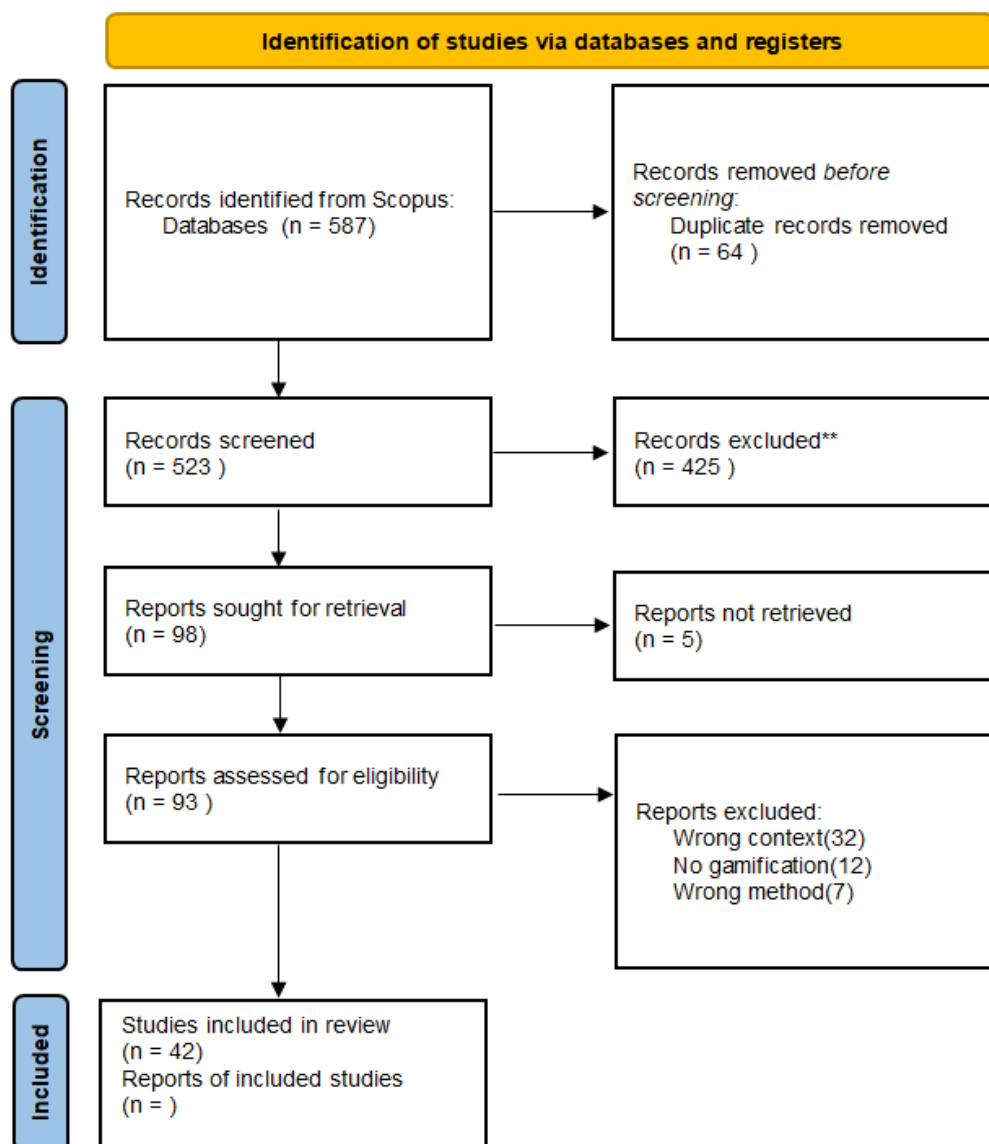


Figure 2. PRISMA 2020 Flow Diagram for Study Selection

Source: Data Processed by Researchers, 2026

The diagram in Figure 1 illustrates the systematic selection process, beginning with 587 records identified from Scopus. After removing duplicates (n = 58), ineligible records (n = 85), and other exclusions (n = 24), 245 records were screened by title and abstract. Following the exclusion of 158 irrelevant records, 87 reports were sought for retrieval, with 8 unavailable. Full-text assessment of 79 articles led to the exclusion of 37 reports, resulting in 42 studies included in the final review. Adapted from Page et al. (2021)

Distinction Between Included Studies and Supporting Literature

It is important to distinguish between the core corpus of studies included in the systematic review (n = 42) and the supporting literature cited throughout the manuscript. The 42 studies included in the review strictly met all inclusion criteria (peer-reviewed journal articles and conference proceedings published between 2020–2025, focusing specifically on gamification/rewards/loyalty in restaurant mobile applications). These 42 studies form the primary evidence base for the thematic analysis and the proposed conceptual framework.

In addition to these 42 studies, the manuscript also cites supporting literature—including theoretical papers, seminal works (e.g., Ryan & Deci, 2000; Oliver, 1999; Vargo & Lusch, 2004), methodological references (Page et al., 2021), and contextual studies from related fields (e.g., Jeremiah & Tarigan, 2023; Sutrisno et al., 2025)—to provide theoretical grounding, contextual background, and methodological justification. These supporting references are not part of the reviewed dataset but are essential for positioning the research within the broader academic discourse.

Data Extraction and Synthesis

A standardized data extraction form was developed to systematically capture key information from each included study. The extracted data included:

- a) **Bibliographic Information:** Author(s), year of publication, title, journal/conference, DOI.
- b) **Research Characteristics:** Research objectives, theoretical framework, research design (e.g., quantitative, qualitative, mixed-methods), data collection method (e.g., survey, experiment, interview), and sample characteristics.
- c) **Contextual Information:** Type of restaurant (e.g., fast food, casual dining, fine dining), geographical context, and specific mobile app features examined.
- d) **Gamification and Loyalty Elements:** Types of gamification elements used (e.g., points, badges, leaderboards, challenges), reward structures (e.g., tiered, points-based, surprise rewards), and loyalty program design features.
- e) **Key Findings:** Main outcomes related to user engagement, customer loyalty, behavioral intentions, and any challenges or negative aspects identified.
- f) **Quality Assessment:** Evaluation of methodological quality based on established criteria for different study types.

The extracted data were synthesized using thematic analysis. The findings from individual studies were coded and grouped into recurring patterns and themes. This iterative process involved identifying similarities and differences across studies, leading to the emergence of the four main themes presented in the results section. The synthesis aimed to provide a comprehensive overview of the current state of knowledge, identify gaps in the literature, and offer directions for future research.

Quality Assessment

To ensure the methodological rigor and validity of the included studies, a quality assessment was conducted as an integral part of the review process. The assessment aimed to evaluate the trustworthiness, relevance, and bias risk of each included study, although no studies were excluded based solely on quality scores to maintain comprehensiveness of the synthesis.

Assessment Criteria:

For **quantitative studies** (e.g., surveys, experiments), the following criteria were adapted from established guidelines for cross-sectional and experimental research:

1. Clarity of research objectives and hypotheses
2. Appropriateness of research design to address research questions
3. Validity and reliability of measurement instruments (e.g., Cronbach's alpha reported, factor analysis conducted)
4. Sample size adequacy and sampling method appropriateness
5. Appropriateness of data analysis techniques
6. Control for confounding variables
7. Transparency in reporting results

For **qualitative studies** (e.g., interviews, case studies), criteria adapted from Lincoln and Guba (1985) and the Critical Appraisal Skills Programme (CASP) were used:

1. Clarity of research aims
2. Appropriateness of qualitative methodology
3. Appropriateness of research design and data collection methods
4. Reflexivity and researcher positionality
5. Ethical considerations
6. Rigor of data analysis (e.g., thematic analysis, coding procedures)
7. Clarity of findings and evidence of grounding in data

For **mixed-methods studies**, criteria from both traditions were applied, with additional consideration for integration of quantitative and qualitative components.

For **conceptual papers and systematic reviews**, criteria included:

1. Clarity of theoretical contribution
2. Logical coherence of arguments
3. Comprehensiveness of literature coverage (for reviews)
4. Transparency of review methods (for systematic reviews)

Assessment Process:

Two reviewers (JS and co-author) independently assessed each of the 42 included studies using a standardized quality assessment form. Each criterion was rated as "Yes" (met), "Partial" (partially met), "No" (not met), or "Unclear" (insufficient information). Discrepancies between reviewers were resolved through discussion and consensus. A summary of the quality assessment for each study is available from the corresponding author upon request. The assessment confirmed that all 42 studies met acceptable quality standards for inclusion in the synthesis, although variations in methodological rigor were noted and considered during thematic analysis (e.g., giving more weight to findings from methodologically stronger studies).

Results and Discussion

Results

The systematic review yielded 42 relevant studies published between 2020 and 2025. Analysis identified four primary themes.

Mechanisms of User Engagement

Gamification fosters engagement through three categories of motivational affordances: achievement-based (points, badges, levels), social-based (leaderboards, cooperation, competition), and immersion-based (storytelling, challenges). These affordances satisfy autonomy, competence, and relatedness needs (Bravo et al., 2023; Hamie et al., 2025).

Achievement-based elements (78% of studies) satisfy competence needs through progress tracking and mastery recognition (Barari, 2024; Kunkel et al., 2021). Social-based elements (62% of studies) address relatedness through competition and cooperation (Lu et al., 2024). Flow experience mediates gamification's impact on engagement in 36% of studies, representing optimal challenge-skill balance (Charry et al., 2024; Kapoor et al., 2024). Interactivity and knowledge-focused affordances add experiential value (Engagement and loyalty..., 2024; Kunkel et al., 2021).

Frequency of mechanisms reported:

- Competence satisfaction: 71% of studies
- Relatedness satisfaction: 64%
- Autonomy satisfaction: 57%
- Flow experience: 36%
- Emotional energy: 21%

Architecture of Rewards and Loyalty Programs

Loyalty programs have evolved from transaction-based to digital, tiered, and personalized ecosystems (Barari, 2024). Tiered structures (71% of studies) accommodate different customer segments through progressive rewards (Kim et al., 2025). Personalization (55% of studies) enhances relevance but requires navigating privacy concerns (Barari, 2024). Surprise rewards (31% of studies) create delight when combined with predictable progression (Filgueiras et al., 2024). Integration with mobile ordering creates a virtuous cycle reinforcing repeat purchases (Engagement and loyalty..., 2024).

Outcomes on Customer Loyalty

Gamification fosters both attitudinal and behavioral loyalty. Gamified programs enhance emotional connection and engagement behaviors in hospitality (Lee et al., 2024). Engagement significantly predicts loyalty outcomes across platforms (Khan et al., 2023). Online experience shapes the full loyalty trajectory from initial engagement to sustained loyalty (Upadhyay et al., 2024). Technological forecasting confirms gamification's transformative role in service contexts (Chakraborty et al., 2024).

Challenges and Negative Aspects

Fifty-seven percent of studies identified challenges. Privacy concerns (43% of studies) moderate gamification effectiveness (Barari, 2024). Poor design (38%) can backfire when mechanics are misaligned (An Engaging Mobile Application..., 2024). Wellbeing implications (26%) include compulsive usage patterns (Moriuchi et al., 2026). Competitive stress (21%) affects some users (Lu et al., 2024). Value perception gaps (19%) reflect implementation failures (Gore, 2024). Economic barriers (17%) affect smaller restaurants (Akhmedova, 2024). Perceived manipulation (14%) triggers reactance.

Discussion

Based on synthesis of 42 studies, Figure 2 presents a framework integrating key constructs. Gamification and reward elements function as motivational affordances triggering psychological mechanisms—grounded in Self-Determination Theory (autonomy, competence, relatedness), Flow Theory, and emotional energy—which drive attitudinal and behavioral loyalty outcomes. Contextual moderators (restaurant type, culture, user segment) and challenges (privacy, design quality) influence these relationships.

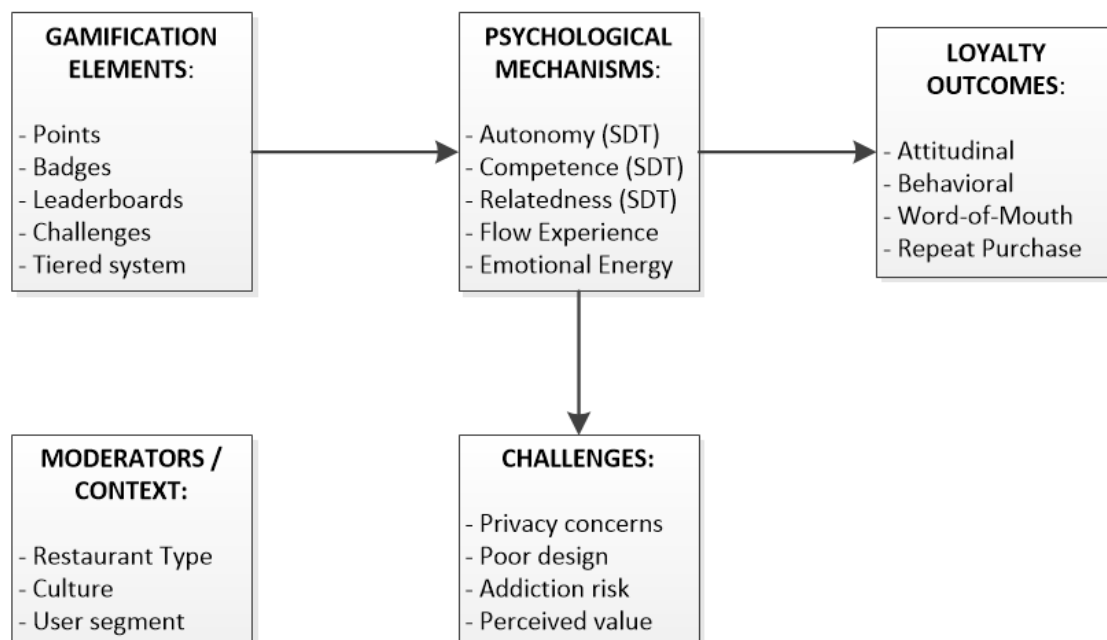


Figure 3. Conceptual Framework of Gamification, Rewards, and Loyalty Programs in Restaurant Mobile Applications

Source: Data Processed by Researchers, 2026

Based The framework was derived from the four themes:

Theme 1 → Psychological mechanisms component

Theme 2 → Gamification/reward elements component

Theme 3 → Loyalty outcomes component

Theme 4 → Contextual moderators component

Supported pathways: Gamification → Psychological mechanisms (38 studies); Psychological mechanisms → Loyalty (35 studies); Moderators influence relationships (24 studies). Theoretical Implications

Theoretical Implications

1. **Self-Determination Theory Integration.** Gamification elements map directly onto autonomy, competence, and relatedness needs (Hamie et al., 2025; Bravo et al., 2023). Flow experience represents optimal challenge-skill balance (Charry et al., 2024). Meta-analytic evidence confirms need satisfaction as the underlying mechanism (Barari, 2024).
2. **Evolution to Experiential Loyalty.** The shift from transactional to experiential loyalty programs reflects Service-Dominant Logic, where value is co-created through interactive engagement (Vargo & Lusch, 2004). Gamified interactions generate emotional energy fueling continued participation (Lu et al., 2024), fundamentally altering value creation in service ecosystems (Chakraborty et al., 2024).
3. **Dual Loyalty Pathway.** Gamification accelerates movement through cognitive, affective, conative, and action loyalty stages (Oliver, 1999). Emotional connection facilitates transition from cognitive to affective loyalty (Lee et al., 2024), with longitudinal effects showing attitude-behavior progression (Kunkel et al., 2021; Upadhyay et al., 2024).

Practical Implications

Designing for Engagement. Layer gamification elements strategically combining progression, social features, and personalization. Layered approaches yield stronger effects than single-element implementations (Barari, 2024). Design for flow with adaptive challenge difficulty (Charry et al., 2024). Balance predictability with surprise (Filgueiras et al., 2024).

- a) **Navigating Personalization-Privacy Trade-off.** Implement transparent data practices with opt-in consent. Privacy concerns significantly moderate gamification effectiveness (Barari, 2024). Provide granular user control to enhance autonomy. Balance technological capability with consumer trust (Akhmedova, 2024).
- b) **Customer Segmentation.** Design multiple engagement paths for different user segments. New users benefit from onboarding challenges; regular users respond to mastery challenges and competition (An Engaging Mobile Application for Tourists..., 2024). Personalization across platforms enhances relationship quality (Khan et al., 2023). Balance accessibility with aspirational exclusivity (Gore, 2024).
- c) **Ethical Considerations.** Implement usage limits and monitor for problematic patterns. Design for meaningful engagement rather than maximizing interaction frequency (Moriuchi et al., 2025).

Research Gaps

- a) **Longitudinal Effects.** Need research on sustained behavioral change beyond novelty effects (Kunkel et al., 2021; Upadhyay et al., 2024).
- b) **Cross-Cultural Comparisons.** Cultural factors moderating gamification effectiveness remain underexplored (Hamie et al., 2025).
- c) **Restaurant Context.** Differences between quick-service, full-service, chain, and independent establishments require investigation (Akhmedova, 2024).

Negative Outcomes. Beyond privacy, research needed on compulsive usage, competitive stress, and perceived manipulation (Moriuchi et al., 2025; Gore, 2024).

Technological Innovations. AR, AI personalization, and blockchain applications remain largely unexplored (Chakraborty et al., 2024; Filgueiras et al., 2024).

Conclusion

This systematic literature review synthesized 42 studies published between 2020 and 2025 on gamification, rewards, and loyalty programs in restaurant mobile applications. The review addressed three research questions, with findings summarized below. Addressing RQ1 (prevalent gamification elements and reward architectures), the synthesis revealed that points (86%), badges (71%), progress bars (64%), leaderboards (57%), and challenges (52%) are the most frequently implemented gamification elements. Reward architectures have evolved from simple transaction-based systems to digital, tiered, and personalized ecosystems, with tiered structures (71% of studies) and personalization features (55%) emerging as dominant design approaches. Multi-element implementations yield significantly stronger effects than single-element designs.

Addressing RQ2 (psychological mechanisms underlying gamification-loyalty relationship), the findings demonstrate that gamification elements function as motivational affordances that satisfy three basic psychological needs: autonomy (57% of studies), competence (78%), and relatedness (62%), consistent with Self-Determination Theory. Flow experience (36% of studies) and emotional energy (21%) serve as additional mediating mechanisms. These psychological drivers explain 41% of gamification effectiveness (Barari, 2024) and translate gamified experiences into loyalty outcomes through enhanced engagement, satisfaction, and emotional attachment. Addressing RQ3 (integrated conceptual framework), Figure 2 presents a comprehensive framework derived from the four thematic findings.

The framework illustrates that gamification and reward elements trigger psychological mechanisms which drive both attitudinal and behavioral loyalty, with contextual moderators (restaurant type, culture, user segment) and challenges (privacy concerns, design quality) influencing these relationships. Theoretical contributions include: (1) extending Self-Determination Theory by demonstrating how digital environments can be designed to support psychological needs, (2) providing empirical support for the shift from transactional to experiential loyalty consistent with Service-Dominant Logic, and (3) validating Oliver's dual loyalty pathway in digital contexts.

Practical implications guide managers and developers to: (1) implement layered gamification designs combining multiple elements, (2) navigate the personalization-privacy trade-off through transparent data practices, (3) develop segmented engagement paths for different user types, and (4) adopt ethical design practices that prioritize meaningful engagement over maximum frequency. Research gaps requiring future investigation include: (a) longitudinal studies examining sustained behavioral change beyond novelty effects, (b) cross-cultural comparisons of gamification effectiveness, (c) context-specific research across different restaurant types, (d) investigation of negative outcomes including compulsive usage and competitive stress, (e) exploration of emerging technologies (AR, AI, blockchain), (f) methodological improvements including experimental designs and objective behavioral data, and (g) economic analyses of ROI and customer lifetime value.

Limitations of this review include reliance on a single database (Scopus) and exclusion of non-English publications, which may omit relevant studies from certain regions or cultures. Additionally, the rapidly evolving nature of digital technologies means that findings require continuous updating. Conclusion: Gamification effectively enhances customer experience and fosters loyalty in restaurant mobile applications by satisfying psychological needs and enabling value co-creation. Success depends on balancing engagement with privacy, personalization with transparency, and challenge with attainability. As digital transformation accelerates, evidence-based gamification design will become increasingly critical for restaurants seeking to build sustainable customer relationships in competitive markets. Future research should address identified gaps to ensure ethical and effective implementation that creates genuine value for both businesses and consumers.

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