

## BEHAVIOURAL IMPACT OF GAMIFICATION ON DIGITAL PAYMENT APPS: GAME ON – PAY ON

**Dr. J. Jaya Lakshmi\***

Assistant Professor of Economics

Virudhunagar Hindu Nadars' Senthikumara Nadar College

Virudhunagar, Tamil Nadu

\*Corresponding author | Received: 05/10/2025 | Accepted: 01/11/2025 | Published: 05/11/2025

### Abstract

*The emergence of financial technologies, powered by innovations in artificial intelligence, blockchain, and mobile platforms, has transformed the way users interact with digital banking services. Amid growing competition, gamification has become an increasingly popular strategy to boost user engagement, satisfaction, and loyalty by integrating game-like elements such as rewards, challenges, badges, and progress tracking into banking apps. This study explores how demographic characteristics, autonomous motivation, perceived ease of use, perceived usefulness, competency, and autonomy influence users' attitudes toward gamified digital banking applications, and how these attitudes shape their behavioural intentions. Drawing insights from relevant literature and user perceptions, the research emphasizes the psychological and design factors that contribute to a meaningful gamified experience. The findings aim to guide banks and fintech companies in developing ethical, inclusive, and user-centric gamification strategies that not only enhance usability but also promote financial literacy, motivation, and long-term customer engagement in the digital banking ecosystem.*

**Keywords:** Gamification, Digital Banking, User Engagement, Behavioural Intention, Financial Technology (FinTech)

### Introduction

The rapid evolution of financial technology driven by innovations in artificial intelligence, blockchain, mobile applications, and data analytics has redefined how individuals and businesses interact with banking services. Digital banking apps now offer instant, 24/7 access to transactions, bill payments, investment tools, and personal finance management. Yet, despite these advancements, many platforms face the ongoing challenge of maintaining user engagement and loyalty in an increasingly competitive market. Users often abandon apps that lack intuitive interfaces, emotional engagement, or consistent value. In response, financial institutions are increasingly adopting gamification the integration of game-like elements such as progress tracking, badges, leaderboards, surprise rewards, and interactive tasks to transform routine financial activities into engaging experiences. This strategic shift has evolved in phases: early loyalty programs and cashback schemes (2000–2010), mobile wallet-based rewards and seasonal campaigns (2014–2019), and now AI-driven personalization (2020 onwards) that delivers customized insights, goal-setting features, and

financial learning tools. Platforms like Google Pay, Paytm, and JAR exemplify these innovations by offering scratch cards, savings challenges, and real-time feedback. Beyond enhancing usability, gamification has also shown promise in improving financial literacy, promoting positive spending habits, and encouraging long-term savings behaviour. Despite its benefits, challenges persist including data privacy issues, regulatory barriers, the risk of over-incentivizing spending, and high development costs. Looking ahead, emerging trends like blockchain-based rewards, NFT-linked loyalty programs, AR/VR financial simulations, and voice-based gamified interactions are expected to redefine user experiences. Moreover, gamification is increasingly aligned with environmental and social goals, rewarding users for sustainable and ethical financial decisions. As digital finance continues to expand, gamification stands not just as a tool for engagement, but as a catalyst for building financially informed, responsible, and loyal user communities.

### Statement of the Problem

Many digital banking apps still struggle to retain long-term user engagement and commitment, even with the quick expansion of digital banking and the uptake of fintech advances. There is still a lack of knowledge about how users' demographic traits, motivational factors, and perceived usability affect their attitudes and behavioural intentions toward gamified digital banking apps, despite the fact that gamification techniques like reward points, leader boards, and interactive challenges have demonstrated the ability to improve user experience and encourage sustained app usage. This study aims to solve these problems by examining the ways in which users' attitudes toward utilizing gamified digital banking apps are influenced by their demographic characteristics, autonomous motivation, perceived ease of use, perceived utility, competency, and autonomy. The study will also look at how behavioural intentions to keep using these apps are impacted by favourable user sentiments.

### Review of Literature

**Brown (2019)** explores how gamification strategies particularly rewards and incentive systems—enhance user engagement in financial services. The study underscores the psychological appeal of earning rewards, noting that gamified experiences transform mundane financial tasks into motivating and satisfying interactions that improve platform stickiness.

**Chen and Roberts (2021)** investigate the relationship between gamified interface design and consumer behaviour, focusing on ease of use and digital adoption. Their research reveals that

intuitive and interactive gamification elements significantly lower usability barriers, fostering greater comfort and adoption among diverse user groups.

**Garcia and Lee (2022)** analyze the integration of AI-driven personalization within gamified finance apps, demonstrating how adaptive challenges and tailored financial insights increase user satisfaction and behavioural consistency. Their findings affirm the role of machine learning in enhancing engagement through real-time, data-informed feedback.

**Henderson (2023)** evaluates the role of interactive learning tools in improving financial literacy via digital banking platforms. The study confirms that gamified modules such as quizzes and savings challenges empower users with better financial decision-making skills and foster long-term positive habits.

**Johnson and Kim (2023)** assess motivational dynamics within gamified banking environments, highlighting the influence of intrinsic motivation and goal achievement on user retention. Their findings suggest that gamified apps that align with users' personal values and autonomy achieve higher engagement and loyalty.

**Jones and Patel (2020)** examine the convergence of blockchain technology and gamification in digital finance, arguing that decentralized, transparent reward systems increase user trust, data security, and platform integrity. Their study positions blockchain as a foundation for ethical, user-centric gamification models.

**Miller and Thompson (2022)** explore the psychological underpinnings of gamification in mobile banking, identifying key design features—like streaks, badges, and social comparison—that trigger behavioural reinforcement. The study concludes that such features significantly impact user engagement, especially among younger demographics.

**Smith, Kumar, and Bhatt (2021)** investigate how digital transformation and user interface innovations influence the usability of financial apps. Their research shows that gamified features such as real-time progress tracking and guided onboarding improve ease of navigation and reduce the digital learning curve.

**Taylor, Clark, and Singh (2020)** focus on gamification's potential to bridge the financial inclusion gap, particularly in underserved populations. They argue that culturally relevant gamified experiences make banking more approachable, improving adoption among users with limited financial literacy.

**Wilson and Carter (2021)** study the long-term impact of gamified reward systems on customer loyalty in fintech. Their research reveals that consistent engagement through points, cashback, and referrals contributes to higher customer lifetime value and strengthens emotional ties with digital banking platforms.

## Objectives

- To explore how users' demographic characteristics, influence their attitude and adoption of gamified digital banking apps
- To examine the impact of autonomous motivation, perceived ease of use, perceived usefulness, competency and autonomy on users' attitudes toward using gamification in digital banking apps.
- To assess the relationship between positive attitude and behavioural intention in the adoption of gamification in digital banking apps.

## Hypotheses

- H1 - Users' attitudes and behavioural intention differ based on demographic factors such as age, education, and occupation.
- H2 - Autonomous motivation has significant impact on users' attitudes toward using gamification in digital banking apps.
- H3 – Perceived ease of use has significant impact on users' attitudes toward using gamification in digital banking apps.
- H4 – Perceived usefulness has significant impact on users' attitudes toward using gamification in digital banking apps.
- H5 - Competency has significant impact on users' attitudes toward using gamification in digital banking apps.
- H6 - Autonomy has significant impact on users' attitudes toward using gamification in digital banking apps.
- H7 - Attitude has significant impact on intention to use gamified digital banking apps.

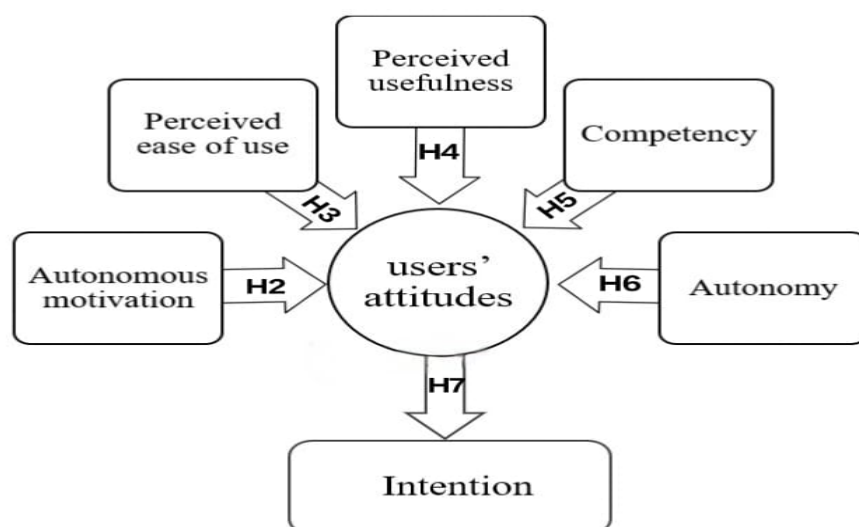


Figure 1 : Hypothesis Model

## Methodology of the Study

### Research Methodology

This chapter deals with the aspects of research methodology used and the work done to develop the final instrument used for data collection. It also describes how the information has been organized and analysed.

### Research Design

The perspective of the people towards gamification was studied, so descriptive research design was adopted for this study.

### Source of Data

- **Primary data**

The primary data is defined as the data, which is collected for the first time and fresh in nature, and happen to be original in character through Google forms.

- **Secondary data**

Secondary data consists of information that has been previously collected and processed by other researchers or institutions. For this study, secondary data was sourced from scholarly articles, academic journals, theses, and reliable web-based resources.

### Sample Size

The primary data has been collected through Google forms method. Google forms Survey has been Conducted using well formulated questionnaire. Samples for the purpose of this study have been selected conveniently. The questionnaire was sent to 400 people who use gamified digital banking apps; 280 responses were received and 255 responses were considered for the study as samples.

### Reliability Test

**Table 1**

| Variables             | Cronbach's Alpha |
|-----------------------|------------------|
| Autonomous motivation | 0.879            |
| Perceived ease of use | 0.906            |
| Perceived usefulness  | 0.924            |
| Competency            | 0.906            |
| Autonomy              | 0.923            |
| Intension             | 0.920            |
| Attitude              | 0.915            |

All constructs demonstrate high internal consistency, as evidenced by Cronbach's Alpha values ranging from 0.879 to 0.924, indicating the reliability of the measurement scales.

### Limitations of the Study

- Respondents' limited awareness of their own digital banking usage patterns may lead to biased or inaccurate responses.
- Variations in respondents' emotions and behaviours over time may affect the consistency and reliability of the data collected.
- Some respondents may be hesitant to disclose personal information or share honest opinions, leading to potential response bias.

### Results and Discussion

#### Frequency Analysis

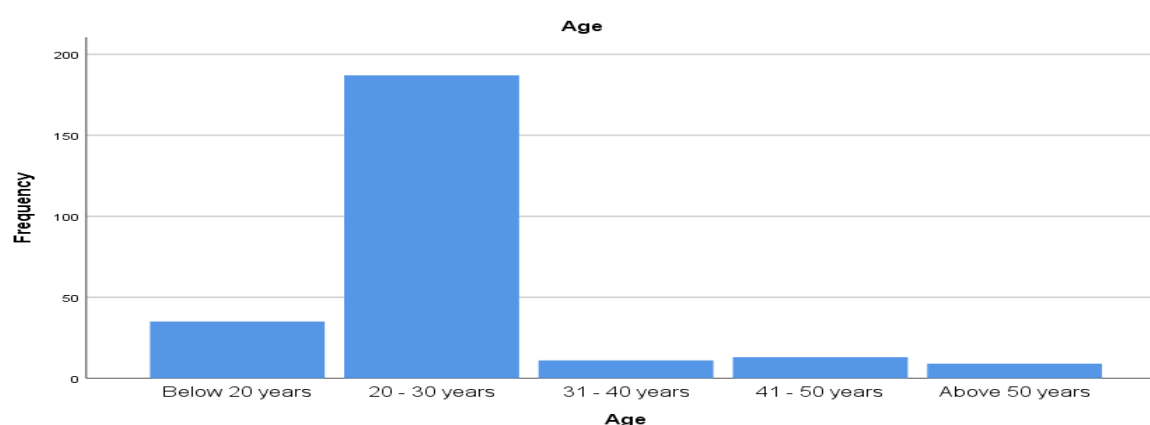
#### Results of frequency analysis for the age of respondents

**Table 2**

| Age            |           |         |               |                    |
|----------------|-----------|---------|---------------|--------------------|
|                | Frequency | Percent | Valid Percent | Cumulative Percent |
| Below 20 years | 35        | 13.7    | 13.7          | 13.7               |
| 20 - 30 years  | 187       | 73.3    | 73.3          | 87.1               |
| 31 - 40 years  | 11        | 4.3     | 4.3           | 91.4               |
| 41 - 50 years  | 13        | 5.1     | 5.1           | 96.5               |
| Above 50 years | 9         | 3.5     | 3.5           | 100.0              |
| Total          | 255       | 100.0   | 100.0         |                    |

Source: Primary Data

**Figure 2**



### Inference

The frequency analysis of respondents' age, as depicted in the table and chart, indicates that the majority of participants fall within the 20 to 30 years age bracket, accounting for 73.3% of the total sample. This significant concentration suggests that young adults are the primary users engaging with gamified features in digital banking applications. Individuals below 20 years make up 13.7%, while older age groups, including 31–40 years (4.3%), 41–50

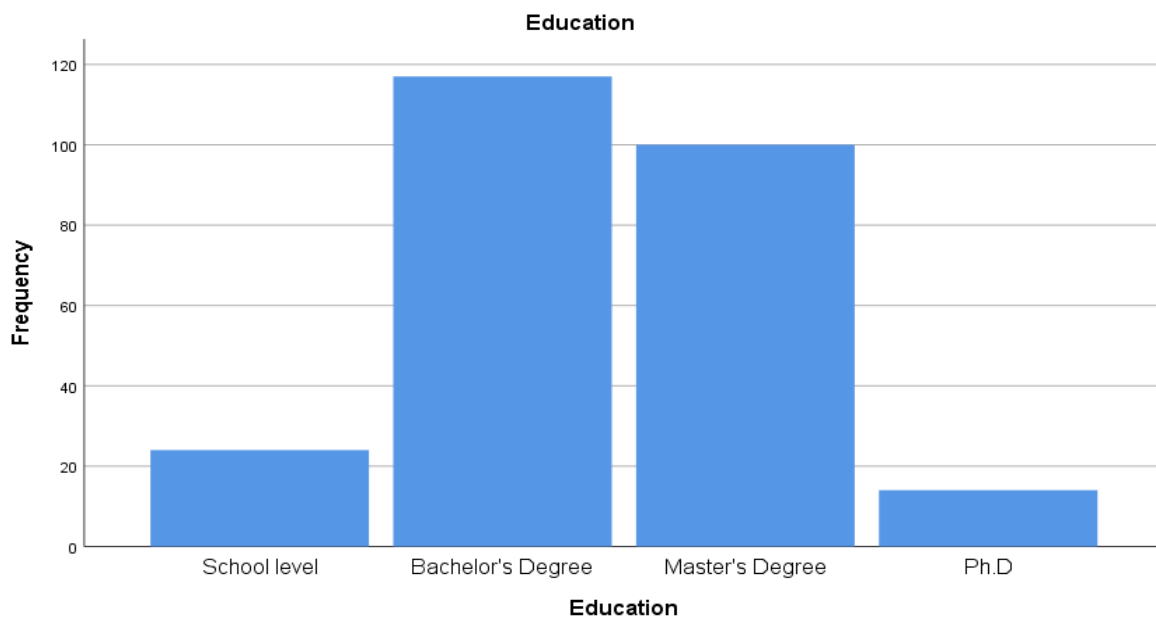
years (5.1%), and above 50 years (3.5%), represent a much smaller portion of the respondent pool. The cumulative percentage reveals that nearly 87% of respondents are under 30, indicating a strong youth presence in the adoption of digital banking technology.

### Results of frequency analysis for the education of respondents

**Table 3**

| <b>Education</b>  |           |         |               |                    |
|-------------------|-----------|---------|---------------|--------------------|
|                   | Frequency | Percent | Valid Percent | Cumulative Percent |
| School level      | 24        | 9.4     | 9.4           | 9.4                |
| Bachelor's Degree | 117       | 45.9    | 45.9          | 55.3               |
| Master's Degree   | 100       | 39.2    | 39.2          | 94.5               |
| Ph.D              | 14        | 5.5     | 5.5           | 100.0              |
| Total             | 255       | 100.0   | 100.0         |                    |

**Figure 3**



### Inference

The data reveals that the majority of respondents are well-educated, with 45.9% holding a Bachelor's degree and 39.2% possessing a Master's degree, while only 9.4% are educated at the school level, and 5.5% have attained a Ph.D. This indicates a highly literate user base, likely to be digitally savvy and receptive to innovative features in financial technology.

### Results of frequency analysis for the occupation of respondents

**Table 4**

| Occupation    |           |         |               |                    |
|---------------|-----------|---------|---------------|--------------------|
|               | Frequency | Percent | Valid Percent | Cumulative Percent |
| Student       | 168       | 65.9    | 65.9          | 65.9               |
| Unemployed    | 8         | 3.1     | 3.1           | 69.0               |
| Employed      | 66        | 25.9    | 25.9          | 94.9               |
| Self-employed | 13        | 5.1     | 5.1           | 100.0              |
| Total         | 255       | 100.0   | 100.0         |                    |

**Figure 4**



### Inference

The data reveals that a significant majority of the respondents (65.9%) are students, followed by 25.9% who are employed, 5.1% self-employed, and only 3.1% unemployed. This indicates that most users are either currently pursuing education or are in the early stages of their careers. In the context of gamification in digital banking apps, this is highly relevant, as students and young professionals are typically more open to interactive and engaging digital experiences.

### Regression Analysis

Results of Regression using Autonomous motivation, Perceived ease of use, Perceived usefulness, Competency, Autonomy, Intention and user's attitude

**Table 5: Modal summary**

| Model Summary                                                                                                       |                   |          |                   |                            |
|---------------------------------------------------------------------------------------------------------------------|-------------------|----------|-------------------|----------------------------|
| Model                                                                                                               | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1                                                                                                                   | .869 <sup>a</sup> | .755     | .750              | .48622                     |
| a. Predictors: (Constant), Autonomy, Perceived Usefulness, Autonomous Motivation, Perceived ease of use, Competency |                   |          |                   |                            |



**Table 6: ANOVA**

| ANOVA <sup>a</sup>                                                                                                  |            |                |     |             |         |                   |
|---------------------------------------------------------------------------------------------------------------------|------------|----------------|-----|-------------|---------|-------------------|
| Model                                                                                                               |            | Sum of Squares | Df  | Mean Square | F       | Sig.              |
| 1                                                                                                                   | Regression | 181.439        | 5   | 36.288      | 153.494 | .000 <sup>b</sup> |
|                                                                                                                     | Residual   | 58.866         | 249 | .236        |         |                   |
|                                                                                                                     | Total      | 240.305        | 254 |             |         |                   |
| a. Dependent Variable: Attitude                                                                                     |            |                |     |             |         |                   |
| b. Predictors: (Constant), Autonomy, Perceived Usefulness, Autonomous Motivation, Perceived ease of use, Competency |            |                |     |             |         |                   |

**Table 7:Coefficients**

| Coefficients <sup>a</sup>       |                       |                             |            |                           |       |      |
|---------------------------------|-----------------------|-----------------------------|------------|---------------------------|-------|------|
| Model                           |                       | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig. |
|                                 |                       | B                           | Std. Error | Beta                      |       |      |
| 1                               | (Constant)            | .023                        | .112       |                           | .206  | .837 |
|                                 | Autonomous otivation  | .333                        | .051       | .321                      | 6.542 | .000 |
|                                 | Perceived ease of use | .151                        | .050       | .151                      | 2.615 | .041 |
|                                 | Perceived Usefulness  | .103                        | .058       | .102                      | 2.784 | .036 |
|                                 | Competency            | .323                        | .070       | .308                      | 4.630 | .000 |
|                                 | Autonomy              | .193                        | .048       | .205                      | 3.992 | .000 |
| a. Dependent Variable: Attitude |                       |                             |            |                           |       |      |

## Inference

The regression analysis reveals a strong and significant relationship between gamification factors and users' attitudes toward digital banking apps. With an  $R^2$  value of 0.755, the model explains 75.5% of the variance in attitude, indicating a high level of predictive power. The overall model is statistically significant ( $F = 153.494$ ,  $p < 0.001$ ). Among the predictors, Autonomous Motivation ( $\beta = .321$ ,  $p < .001$ ), Competency ( $\beta = .308$ ,  $p < .001$ ), and Autonomy ( $\beta = .205$ ,  $p < .001$ ) show the strongest influence on attitude, suggesting that internal drivers and user empowerment play a key role in shaping positive perceptions. Perceived Ease of Use ( $\beta = .151$ ,  $p = .041$ ) and Perceived Usefulness ( $\beta = .102$ ,  $p = .036$ ) also contribute significantly, though to a lesser extent. These results indicate that enhancing intrinsic motivation, skill confidence, independence, and usability features can effectively improve user attitudes toward gamified digital banking experiences.

## Results of Regression using intention and user's attitude

**Table 8: Modal summary**

| Model Summary                       |                   |          |                   |                            |
|-------------------------------------|-------------------|----------|-------------------|----------------------------|
| Model                               | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1                                   | .846 <sup>a</sup> | .715     | .714              | .52956                     |
| a. Predictors: (Constant), Attitude |                   |          |                   |                            |

**Table 9: Anova**

| ANOVA <sup>a</sup>                  |            |                |     |             |         |                   |
|-------------------------------------|------------|----------------|-----|-------------|---------|-------------------|
| Model                               |            | Sum of Squares | Df  | Mean Square | F       | Sig.              |
| 1                                   | Regression | 178.028        | 1   | 178.028     | 634.840 | .000 <sup>b</sup> |
|                                     | Residual   | 70.949         | 253 | .280        |         |                   |
|                                     | Total      | 248.977        | 254 |             |         |                   |
| a. Dependent Variable: Intention    |            |                |     |             |         |                   |
| b. Predictors: (Constant), Attitude |            |                |     |             |         |                   |

**Table10: Coefficients**

| Coefficients <sup>a</sup>        |            |                             |            |                           |        |      |
|----------------------------------|------------|-----------------------------|------------|---------------------------|--------|------|
| Model                            |            | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. |
|                                  |            | B                           | Std. Error | Beta                      |        |      |
| 1                                | (Constant) | .449                        | .105       |                           | 4.294  | .000 |
|                                  | Attitude   | .861                        | .034       | .846                      | 25.196 | .000 |
| a. Dependent Variable: Intention |            |                             |            |                           |        |      |

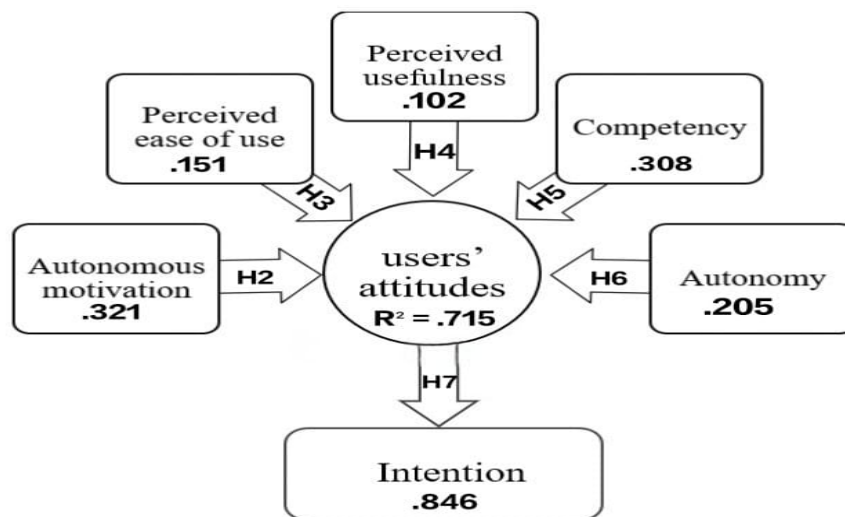
## Inference

The regression analysis reveals a strong and significant positive relationship between users' attitude and their intention to use gamification features in digital banking apps. The model explains approximately 71.5% of the variance in intention ( $R^2 = 0.715$ ), indicating a good fit. The ANOVA results further confirm the model's significance ( $F(1, 253) = 634.840$ ,  $p < 0.001$ ). The coefficient for attitude is both statistically significant ( $p < 0.001$ ) and substantial ( $B = 0.861$ ,  $\beta = 0.846$ ), suggesting that as users' attitudes become more favorable, their intention to engage with gamified banking features increases notably.

**Table 11: Hypothesis result**

| Hypothesis                                        | Beta ( $\beta$ ) | p-value | Effect Strength | Significance |
|---------------------------------------------------|------------------|---------|-----------------|--------------|
| H2 - Autonomous Motivation $\rightarrow$ Attitude | 0.321            | <0.001  | Strong          | Significant  |
| H3 - Perceived Ease of Use $\rightarrow$ Attitude | 0.151            | 0.041   | Moderate        | Significant  |
| H4 - Perceived Usefulness $\rightarrow$ Attitude  | 0.102            | 0.036   | Weak            | Significant  |
| H5 - Competency $\rightarrow$ Attitude            | 0.308            | <0.001  | Strong          | Significant  |
| H6 - Autonomy $\rightarrow$ Attitude              | 0.205            | <0.001  | Moderate        | Significant  |
| H7 - Attitude $\rightarrow$ Intention             | 0.846            | <0.001  | Very Strong     | Significant  |

**Figure 5: Result of Regression Analysis**



## Findings

- The frequency analysis revealed that the majority of users engaging with gamified digital banking apps are young adults, with 73.3% of respondents falling within the 20–30 years age group, indicating that gamification strongly appeals to a tech-savvy younger demographic. In terms of education, 45.9% held a Bachelor's degree and 39.2% a Master's degree, suggesting that most users are well-educated and likely comfortable with digital financial tools. Regarding occupation, 65.9% of respondents were students and 25.9% were employed, highlighting that the primary users of gamified banking features are individuals in academic or early professional stages, making them an ideal target audience for interactive and reward-based financial services.

- The regression analysis revealed that autonomous motivation, perceived ease of use, perceived usefulness, competency, and autonomy significantly influence users' attitudes toward gamified digital banking apps. The model was statistically significant and explained 75.5% of the variance in attitude ( $R^2 = 0.755$ ), with autonomous motivation emerging as the strongest predictor, followed by competency and autonomy. Perceived ease of use and perceived usefulness also had a positive, though comparatively smaller, impact. A separate regression analysis showed that attitude is a strong predictor of behavioural intention, accounting for 71.5% of the variance ( $R^2 = 0.715$ ). The high beta value ( $\beta = 0.846$ ) indicates that users with a more positive attitude toward gamification are significantly more likely to continue using gamified features in digital banking apps.

### Suggestions

- Banks should design gamified features that appeal to the highly engaged 20–30 age group, using elements like competitions, rewards, and badges.
- As gender differences affect perceptions of usefulness and autonomy, features must be inclusive and adaptable to both male and female users.
- Reward systems should go beyond transactions to include behaviours like saving, budgeting, and consistent app usage.
- Ease of use is crucial interfaces must be simple, customizable, and allow users to set personal goals.
- Gamification should foster autonomy and competency by letting users choose their own challenges and pace.
- Introducing tiered loyalty programs can sustain engagement over time.
- Users should be educated about how gamification supports better financial habits.
- Positive user perception must be built through clear communication and meaningful rewards.
- Continuous monitoring and feedback should guide the evolution of gamified features.

### Conclusion

Gamification has emerged as a transformative strategy in digital banking, offering an innovative way to enhance user engagement, satisfaction, and long-term retention. This study demonstrates that psychological factors such as autonomous motivation, perceived ease of use, usefulness, competency, and autonomy significantly shape user attitudes and directly influence their intention to engage with gamified features. As digital banking continues to

evolve, gamification is poised to move beyond simple rewards into more advanced, AI-powered and hyper-personalized systems. Future applications may include real-time adaptive challenges, blockchain-enabled reward systems, and immersive experiences through AR and VR technologies. However, to fully realize these opportunities, banks must focus on ethical implementation, user privacy, and inclusivity. The success of digital banking will depend not only on technological innovation but on the ability to create meaningful, empowering, and user-centered financial experiences through gamification.

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