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JUST LET THEM PLAY: AN EMPIRICAL DEMONSTRATION OF CUSTOMER RETENTION THROUGH GAMIFICATION IN MOBILE FITNESS APP

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ABSTRACT:
Purpose: Acknowledging the challenge of users abandoning fitness apps along with the need for personalized and engaging strategies remains crucial for attaining sustained success. This study enriches the existing scholarship by critically assessing how gamification influences experience dimensions constituents and their consequences on customer retention.
Design & Research Methodology: Quantitative research design includes both Structural Equation Modelling (SEM) and regression approaches used to analyze complex relational dynamics among key variables. Data were collected from 384 app users of the Growfitter fitness app in India, with responses gathered directly through the app interfaces.
Findings: The results suggest that an interactive experience components strongly impacts customer interactions, improving customer loyalty and brand perception. Additionally, gamification has become highly favourable for brand recognition and customer satisfaction, as well as an important role of motivating users to participate and be committed with fitness app ecosystems. These insights reinforce the value of embedding gamification techniques into user touchpoints to optimize sustained engagement and deepen brand connection.
Practical implications: The findings guide the brands in the fitness app industry to add gamification to help users continue using the app and engage more. By incorporating gameful experiences, fitness apps can elevate stronger customer loyalty, strengthen brand awareness, and improve satisfaction. Notably, the results indicate that the benefits of gamification extends uniformly across user segments, suggesting that fitness app brands can adopt these strategies at scale without requiring demographic customization.
Originality: To the best of the author's knowledge, this is the first study in the field of fitness app retention that comprehensively investigates all experience dimensions "Gameful Experience, Customer Experience, and Brand experience" collectively. Additionally, by collecting responses directly through the app interfaces, this study archives high ecological validity, making its insights highly applicable to real-world fitness app marketing and design strategies.

Keywords: Gamification, Fitness, Customer Retention, Mobile App, Customer Loyalty, India.

1. INTRODUCTION:

Technology's incorporation into fitness applications has changed the health and wellness industry, particularly through mobile fitness applications. The worldwide fitness app market, valued at USD 9.25 billion in 2023, is anticipated to grow at a CAGR of 14.08% between 2024 and 2030; this growth is driven mainly by electronic health adoption (Grand View Research, 2023). While fitness apps rank 13th in ACSM's 2019 fitness trends, the number of downloads of apps like Nike Training Club, Peloton, Strava or Sweat grew by 46% in 2020 when online fitness training became an increasingly popular activity [World Economic Forum, 2020; Faßbender, 2021]. Although there are definite challenges in continuing user engagement given that many give up usage in less than 90 days [Amagai et al., 2022; Jossa-Bastidas et al., 2021], a demand for impactful approaches to maintaining audience interactions persists. The decline in user retention is due to 1) boring and repetitive exercises, 2) weak rewards, 3) poorly timed notifications, and 4) distrust of feedback. These factors disproportionately affect users with the tendency of boredom or low self-control,

while engaging experiences and meaningful rewards can help to prevent disengagement (Park & Lee, 2023). To overcome these challenges, gamification— integrating gaming features in the gaming context—has recently emerged as a productive tool to motivate users and engage more (Huotari & Hamari, 2017). Common gamified features like points, badges and leaderboards have been found to enhance the user activity rates on fitness tracker-integrated apps [Neupane et al., 2021; Hamari, 2017].

Gamification not only stimulates engagement but also causes more psychological involvement and better interaction outcomes in every domain, such as fitness, commerce and healthcare (Seiffert-Brockmann, Weitzl,& Henriks, 2018). Gamified features, such as story-driven missions using apps like Zombies Run, Fitbit and MyFitnessPal, help sustain user interest (Hamari, 2017). Although there is a strong connection between gamification and participation, documented proof of gamification's impact on sustained consumer loyalty in fitness applications remains limited [Hofacker et al., 2016; Taşkın & Kılıç Çakmak, 2023]. Studies have noted that gamification boosts customer loyalty through enhanced satisfaction and emotional engagement [Fatima et al., 2021; Tu, Hsieh & Feng, 2019]. One of the key determinants of loyalty is satisfaction, which encourages continued app usage and service repurchase [Anderson & Srinivasan, 2003; Choi & Kim, 2020]. Gamified apps are perceived with a higher value than conventional ones because the loyal user believes an app provides better benefits (Hallowell, 1996; Edvardsson et al., 2000). A user's intention to repurchase or continue usage heavily depends on the service user's experience (Thakur, 2018). Although this dynamic has been explored in a variety of other contexts, such as mobile commerce, usability, and banking, its exploration in fitness apps is underexplored [Mohsin Butt & Aftab, 2013; Toprak & Kılıç, 2023].

This study aims to fill the knowledge gap by examining how gamification affects brand impression, user engagement, and commitment in digital wellness applications. By exploring these dynamics, the study provides insights to help fitness app brands build effective engagement strategies to enhance customer experience and user retention. The primary research question is: "How does gamification impact customer retention in mobile fitness apps?"

2. LITERATURE REVIEW:

Academic research has focused on the gamification of fitness apps on mobile devices, especially on understanding how gamification affects user engagement, motivation, and long-term retention. Although earlier research on gamification techniques offers perspectives on how gamification operates, there has not been a detailed observational analysis of how gamification supports retaining consumers through mental frameworks such as user interaction, brand recognition, and brand perception. The following section critically reviews existing literature about theoretical foundations and research gaps.

2.1 Gamification and User Engagement in Fitness Apps

Integrating gamification in fitness apps, particularly through frameworks like Self-Determination Theory (SDT), has been shown to enhance customer satisfaction, user experience, and retention (Wolf, Weiger, & Hammerschmidt, 2020). Several studies suggest that gameful services stimulate intrinsic motivation, increase engagement, and foster a deeper brand connection, ultimately influencing positive consumer behavior outcomes. In a pivotal study, Beldad and Hegner (2018) expanded the Technology Acceptance Model (TAM) to investigate how social influence and perceived credibility affect fitness app usage. Their findings suggest that while perceived usefulness, ease of use, and social norms drive initial adoption, these factors are insufficient to explain sustained user engagement or brand commitment. Building on this, Bitrián, Buil, and Catalán (2021) emphasize the role of gamification in meeting users' psychological needs for achievement and competence, grounded in SDT. Intrinsic motivation was enhanced by achievement oriented components which was consistent with general findings of gameful experience possessing the ability to increase engagement and shape behaviour in positive ways. In addition, Yin et al.

(2022) used the Kano model to estimate user satisfaction in digital health platforms and showed how carefully crafted gamification can create a substantial boost (affect factor) in overall gaming experience which in turn contributes directly to an increase on customer satisfaction.Furthermore Altmeyer et al. (2021), acknowledge the need for personalization via Hexad user types, proving that tailored game elements can strongly increase engagement as well as meaningful behavior change. Nevertheless, a significant portion of the current research on user engagement still concentrates on participation and the initial motivation (often ignoring long term user retention or brand perception). Furthermore, there is insufficient investigation into how gamification tends to have different effects from different demographics groups which is a big gap that this study seeks to address.

H1: Gameful Experience will positively influence Customer Experience.

2.2 Impact of Game-Based Strategies on Brand Perception and Commitment

The effects of gamification on participation and user motivation have been widely researched, but its impact on brand commitment and emotional brand experience is less well investigated. For instance, Molina and Myrick (2021) studied how users engaged in the Body Space fitness app and found that while users attracted by appearance and social factors were initially incentivized, their motives soon switched to intrinsic rewards such as stress relief. It also highlights the importance of gamification strategies that are sensitive to user's evolving motivations in maintaining long term user's engagement.

Jossa-Bastidas et al. (2021) leveraged an Artificial Intelligence (AI) model to determine training frequency was a significant predictor of app adherence. While their study did not investigate why users stay engaged beyond their normal exercise routines, nor did it deliberate the gamified components as emotional motivators of brand connection.However, this present study seeks to fill the gap by looking at how gameful experiences, when rich in emotional resonance can better promote brand engagement and loyalty. Additionally, Huang and Ren (2020) explained the internal mechanism of how exercise self efficacy mediated the effect of TAM in the Chinese context to motivate app usage. Their findings help us to understand how habits are formed, but they do not tie specific gamified app features to emotional brand attachment, a key component of the overall brand experience. Emerging research begins to bridge this gap. For instance, Habachi, Matute, and Palau-Saumell (2024) showed that fulfilling consumer experiences, particularly those enhanced through gamification, can cultivate strong emotional bonds with the brand, ultimately driving greater brand loyalty and retention. This is reinforced by Nobre and Ferreira (2017), who found that strategic gamification enhances brand interaction, encourages word-of-mouth promotion, and offers insights for brand positioning. Real-world applications further validate these findings. Lin et al. (2022) analyzed Starbucks' gamified loyalty program, highlighting how game mechanics such as challenges and point systems significantly improved brand experience and consumer advocacy. These findings collectively suggest that positive customer experiences, when delivered through meaningful and emotionally engaging gamified strategies, can serve as powerful precursors to brand experience.

H2: Customer Experience will positively influence Brand Experience.

2.3 The Role of Psychological Factors in Retention

Achieving intrinsic motivation through gamification has been well-supported in literature, but why some game features lead to sustained user retention in fitness apps remains insufficiently explored. Chiu and Cho (2021), using the Technology Readiness and Adoption Framework (TRAF), found that individual preparedness influences user satisfaction—where low readiness reduces involvement, and high readiness improves accessibility and engagement. This points to individual psychological traits as key predictors in gamification success. In examining gamified app design, Cotton and Patel (2019) observed a widespread use of game elements but also noted a lack of

application of behavioral economics, which is critical for sustained user efficacy. In other words, it's not enough to include game features; they have to be embedded more thoughtfully so as to maintain long term engagement. Furthermore, from the psychological perspective, SDT can offer a much needed view to explain how gamification satisfies the needs for autonomy, competence and relatedness. Findings of Mustafa et al. (2023) and Wang et al. (2021) reinforce these insights.Gamified environments were more effective driving motivation and user retention (Vdov, 2020) as engaging positive emotion in a deeper brand engagement (Yadav, 2022). In addition, Valcarce-Torrente et al. (2021) state that fitness apps alone may not be enough to achieve long term behavioral change; instead, there needs to be a structured engagement strategy. Together these studies reinforce that gamification that is meaningfully designed with positive customer experiences can create a strong effect on persistence of user loyalty and continued app usage.

H3: The Effect of Customer Experience is stated to have a positive effect on Customer Retention.

Even more, new research advocates that user satisfaction could be the critical intermediary factor between the participated experiences and continued customer loyalty. For instance, the studies of Ludovino Ferreira (2021) revealed that userfriendly apps which are equipped with gamified elements, improve user satisfaction and retention. This is similar to what Macon (2020) linked service satisfaction straight to some long-term customer loyalty and Ferreira-Barbosa, García-Fernández and Cepeda-Carrión (2024) dismissed that gamified engagement plays a very helpful mediating role in between the relationship between satisfaction and restoration of fitness platforms.

H5: Interactive Experience impacts User Retention through User Satisfaction.

2.4 Theoretical Gap: From Gamification to Customer Retention

Although gamification has been found to improve engagement and motivation, its immediate effect on long term customer retention is insufficiently investigated. Ma et al. (2023) assessed the implication of competitive elements to sustain user engagement but did not uncover its relationship with brand loyalty. Additionally, Sampat, Beih and Raj (2023) assessed how personalization led to customer loyalty without looking into the different parts of customer experience over its long term retention. While Zhou, Krishnan and Dincelli (2022) found that interactivity leads to overall engagement, they failed to examine the role that these interactive features play in building brand awareness and sustained loyalty. To this concept, Faßbender (2021) also diversifies adding into the idea that the habit formation and enjoyment which constitute an essential element of interactive gamified design, significantly enhances app loyalty. This perspective is reinforced by Jang et al. (2018), in showing how gamified incentives enrich consumer-brand interactions.Furthermore, Balakrishnan and Griffiths (2018) suggest that the brand loyalty meditates the relationship between gamification and retention and showing how brand identification plays a vital role in gamification. These findings taken in combination, shows that brand recognition can act as the mediating mechanism between the engagement with gamified experiences and user retention over the long run which essentially bridges the gap between fleeting engagement and sustained commitment.

H4: Brand Recognition influences the connection between Interactive Experience and User Retention

2.5 Addressing the Research Gap

Gamification is well documented as an effective engagement motivator, but what's much less understood is how it contributes to the long term development of brand experience and user retention. In this study, based on SDT, we investigate how interactive experiences, satisfaction, and brand perception drive retention, as well as accounting for the influence of demographic factors.

3. THEORETICAL FRAMEWORK

SDT, originally developed by Deci and Ryan (1985), is now a highly accepted cognitive motivational framework that attributes motivation in humans altogether to three basic psychological needs of autonomy, competence and relatedness. In essence, satisfying these needs fosters internal motivation, involvement, and well-being. This framework is especially well suited for the study of digital wellness gamification, since it suggests how application of gamification elements could meet users' core psychological needs and thus motivate further engagement and engagement persistence.

The personal challenges and user directed goal setting make the game mechanics serve their purpose of fostering the sense of autonomy by allowing the users the control over their fitness journey. To that extent, the work of Mustafa et al. (2023) showed personalizing the options and providing flexible in app features increased users felt control which also increased motivation and long term engagement. Wang et al. (2021) also criticized that autonomy is very important in terms of affecting the user satisfaction and consequently user retention of the gamified mobile health applications. Gamification aspects like leaderboards, badges, point systems not only give near real time feedback, it also gives us that feeling of accomplishment. Also, it is essential in fostering users' perceived competence. Feng, Tu and Hsieh (2020) also find further support of this connection between feedback and competence; the gamification components of giving real time feedback can significantly enhance people's feeling of competence, thus increase people's intrinsic motivation and retained loyalty.

According to Hamari (2017), leaderboards along with other progress indicators not only make users feel competent which encourages them to adopt competitive behaviour, but also increase the average engagement levels. By inspiring a sense of relatedness through social features such as creation of community based challenges and sharing options, a strong sense of community is created through meaningful connections among users, expanding the experience outside of individual achievement to shared participation. The feeling of relatedness is induced by social interactions such as community challenges, increased app usage, and engagement, as Valcarce-Torrente et al. (2021) conclude. Furthermore, users who were part of the social features of fitness apps felt a stronger emotional connection between users (Molina & Myrick, 2021) which was associated with better retention and brand loyalty.

Importantly, these findings illustrate that SDT can inform reasons as to how gamification in fitness apps may fulfil users'

psychological needs and lead to higher engagement, satisfaction, and retention. Understanding SDT's 'autonomy, competence, and relatedness core features and the gamified aspects (personalized challenges, leaderboards, social features) allows fitness brands to build strong strategies to build long-term user loyalty.

3.1 Proposed Research Model:

In the suggested research framework, SDT offers a well-organized way to show how gamification affects user experience, brand identification, brand perception, user satisfaction, and user retention. Internal motivation is strengthened by a favourable user experience based on the achievement of autonomy, competence, and relatedness. As a result, users cultivate a deeper emotional connection to the brand and how they see the brand's efficiency. Interactive experiences influence the connection between interactive experiences and user retention through elevated user satisfaction, which stems from fulfilling these cognitive requirements. By consistently addressing these cognitive requirements, these users are eventually maintained due to enhanced internal motivation and prolonged participation. Incorporating SDT into this research enhances a thorough comprehension of how gamification in digital wellness applications attracts users, fulfils their needs, and preserves their engagement, forming a strong basis for analyzing the driving forces at work.

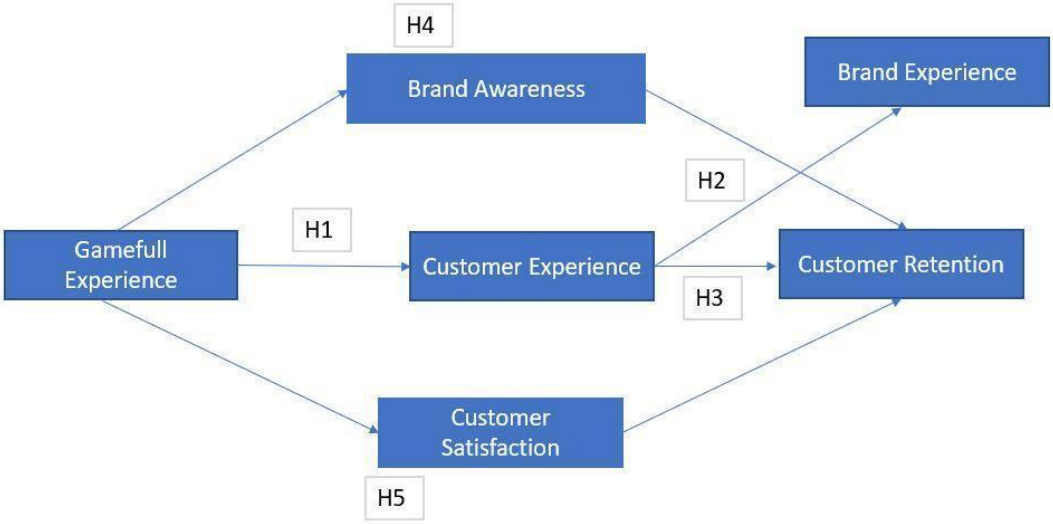

Figure 1: Proposed Conceptual Framework

4. RESEARCH METHODOLOGY

In this study, a numerical research strategy was used, utilizing a one-time survey to evaluate the impact of personalization on users' use of a mobile fitness app. We selected a deliberate sample of 384 participants from the mobile fitness app GrowFitter to obtain varied demographics. A structured questionnaire based on validated scales was used to gather the data using Likert scales 5, where 1 means "strongly disagree" and 5 means "strongly agree." The questionnaire was disseminated via the app itself and its social media.

SPSS AMOS was utilized for data examination, where SEM took place to assess the suggested theories and investigate the associations among variables. Since AMOS enables the assessment of both immediate and indirect impacts and measurement inaccuracies, In addition to the alignment of the model, indicators like Chi-square values, Comparative Fit Indicator (CFI), and Root Mean Square Deviation (RMSD) were applied to evaluate the adequacy of fit of the SEM frameworks. Cronbach's alpha and confirmatory factor assessment (CFA) assessed scales for dependability and legitimacy to guarantee internal stability and concept validity. Mediation analysis was executed using the resampling method to analyze the intervening influences of brand recognition and client satisfaction on how fun engagement and client loyalty are related. Furthermore, moderation analysis was undertaken to explore the impact of socioeconomic aspects (income, educational background, and geographical location) on the connection between playful interaction and customer loyalty.

5. DATA ANALYSIS

5.1 Demographic Factors Descriptive

The demographic factors' statistical information, such as gender and age, Occupation, the respondents' income and level of education, are presented in the table below.

Table 1 Descriptive of Demographic Variables

Demographic Variables		Frequency	Per cent
Gender	Male	319	83.1
	Female	65	16.9
	Total	384	100.0
Age	13 to 19 years	147	38.3
	20 to 30 years	175	45.6
	31 to 40 years	41	10.7

	41 to 50 years	13	3.3
	51 years and above	8	2.1
	Total	384	100.0
Occupation	Business	36	9.4
	Employed	82	21.4
	Housewife	2	0.5
	Retired	3	0.8
	Student	5	1.3
	Teacher	4	1.0
	Trading	2	0.5
	Unemployed	250	65.1
	Total	384	100.0
Education	Primary Education	22	5.7
	Secondary Education	91	23.7
	Higher Secondary / Diploma / ITI	74	19.3
	Graduation (UG)	141	36.7
	Post -Graduation (PG)	46	12.0
	Higher than PG	10	2.6
	Total	384	100.0
Income	No income	227	59.1
	Less than Rs.15,000/-	59	15.4
	Between Rs.15,000/- and Rs.30,000/-	44	11.4
	Between Rs.30,000/- and Rs.50,000/-	28	7.3
	Between Rs.50,000/- and Rs.75,000/-	8	2.1
	More than Rs.75,000/-	18	4.7
	Total	384	100.0

In this study, 384 customers participated in the survey; Table 1 displays the age, gender, employment, income, and educational attainment among the responders. Of 384, 319 (83.1%) are Male customers and 65 (16.9%) are female customers. The highest number of respondents from the age group 20 to 30 years was 45.6%, followed by 38.3% for 13–19 years and 31–40 years. With 10.7%, 41 to 50 years with 3.3%, and 51 years and above with 2.1%. Regarding respondent's occupations, 65.1% of the respondents are Unemployed, 21.4% are Employed, 9.4% are from Business, 1.3% are students, 1.0% are teachers, 0.8% are retired, 0.5% are trading, and 0.5% are housewives. Concerning their academic qualification, 36.7% fall under the graduate (UG) category, 23.7% have completed Secondary Schooling, 19.3% possess Higher Secondary/Diploma/IIT credentials, 12.0% hold Postgraduate (PG) degrees, 5.7% have attained Primary Schooling, and 2.6% of the participants have qualifications beyond PG. Regarding income status, 59.1% of the participants have no earnings, 15.4% earn below Rs. 15,000/-, 11.4% have an income ranging from Rs. 15,000/- to 30,000/-, 7.3% earn between Rs. 30,000/- and Rs. 50,000/-, 4.7% have earnings exceeding Rs. 75,000/-, and 2.1% of the participants fall within the income range of Rs. 50,000/- to Rs. 75,000/-.

5.2 Reliability

A reliability assessment was performed to assess the internal coherence of the variables' items. Choosing Cronbach's alpha, a frequently used statistic in social science research was made for this

objective. Within the field of social science research, a reliability coefficient that exceeds 0.7 is generally considered to be adequate.

Table 2 Reliability test results

Variables	Items	Mean	Cronbach's alpha
Gameful Experience (GFE)	11	4.082	.933
Customer Experience (CE)	3	4.012	.875
Brand Experience (BE)	5	4.138	.849
Customer Retention (CR)	6	4.123	.907
Brand Awareness (BA)	3	4.199	.727
Customer Satisfaction (CS)	3	4.105	.784

Based on the information in Table 2, the findings indicate that all the factors demonstrated a strong degree of dependability. Specifically, the range of the alpha coefficients was 0.72 to 0.94.

Table 3 List of Abbreviations

Abbreviations	Definition
(χ2) CMIN	Value of Chi-square
DF	Degrees of freedom
GFI	Goodness of Fit
RFI	Relative Fit Index
NFI	Normed Fit Index
IFI	Incremental fit index
CFI	Comparative Fit Index
RMR	Root Mean Square Residuals
RMSEA	Root mean square error of approximation

5.3 Measurement and Structural Model Results

To assess the evaluation model, a CFA was conducted to investigate the model position, authenticity, and coherence. The framework model was subsequently examined to assess the proposed associations.

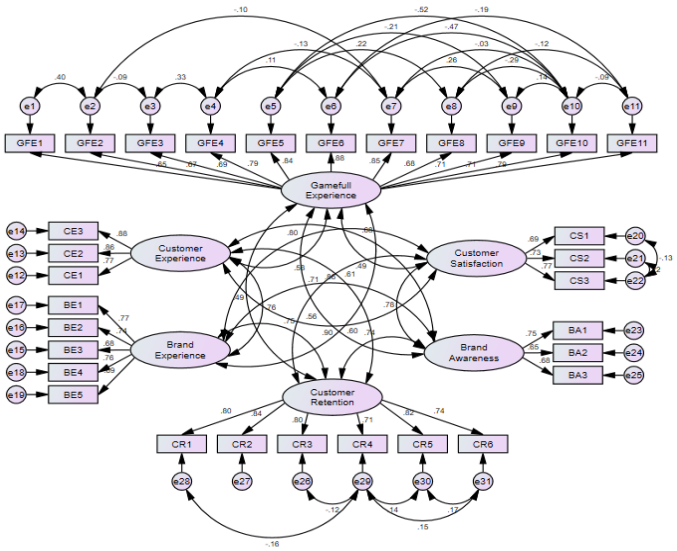

Figure 2: CFA Model

5.3.1 Measurement Model Evaluation

The CFA findings reveal that all elements possess factor loadings exceeding 0.6, meeting the required benchmark for construct authenticity. Cronbach's Alpha figures surpass 0.7 for all constructs, validating internal reliability (Hair et al., 2019). By exceeding 0.5, the Average Variance Extracted (AVE) Convergent reliability is supported by values. The KMO and Bartlett's test results confirm the adequacy for factor analysis (KMO = 0.924, $p < 0.001$).

Model Fit Evaluation

The model fit was evaluated using CMIN/DF, GFI, NFI, IFI, CFI, RMSEA, and RMR. The fit indices show the quality of the model fit.

- CMIN/DF = 3.477 (<5, acceptable)
- GFI = 0.923 (>0.9, good fit)
- NFI = 0.944 (>0.9, good fit)
- CFI = 0.961 (>0.9, excellent fit)
- RMSEA = 0.078 (<0.08, acceptable)
- These results confirm that the measuring model exhibits strong fit and construct validity.

5.4 Assessment of Structural Model

H1: Gameful experience positively influences Customer Experience

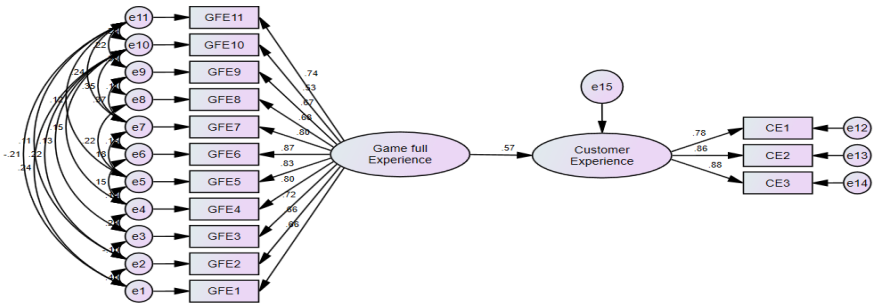

Figure 3: Impact of GFE on CE

Table 4 Regression weights of GFE and CE

Paths	Unstandardized	S.E.	Standardized	C.R.	P
Customer Experience <--- Gameful Experience	.781	.089	.567	8.816	***

Table 4 presents a theoretical structural equation model depicting the mutual dependence between the independent variable, The factor that depends on game-like experiences and CE. The study demonstrates a moderately favourable correlation between the variables (β=.567, P<.05). The C.R. value is relatively elevated, showing that the correlation was statistically meaningful. The fit indications indicate that the model aligns well with the components. It is considered statistically significant when the p-value exceeds 0.05 (Table 5). The total model alignment was assessed using seven different fit indices, and the findings showed a notable favourable connection between GFE and CE.

Table 5 Model fit summary

Variable	CMIN	DF	CMIN/DF	p-value	GFI	RFI	NFI	IFI	CFI	RMR	RMSEA
Value	156.909	54	2.906	0.068	0.947	0.930	0.958	0.972	0.972	0.036	0.071

The model fit summary is presented in the above table 5. From the table, it is observable that the quality of fit for the data was good. GFI, RFI, NFI, IFI, and CFI values are all noticeably more than 0.90. Similarly, the figures RMR and RMSEA remain below the essential benchmark of 0.080. The findings disclosed a strong alignment among RMSEA, RMR, GFI, and CFI for the provided version.

H2: Customer Experience positively influences Brand Experience

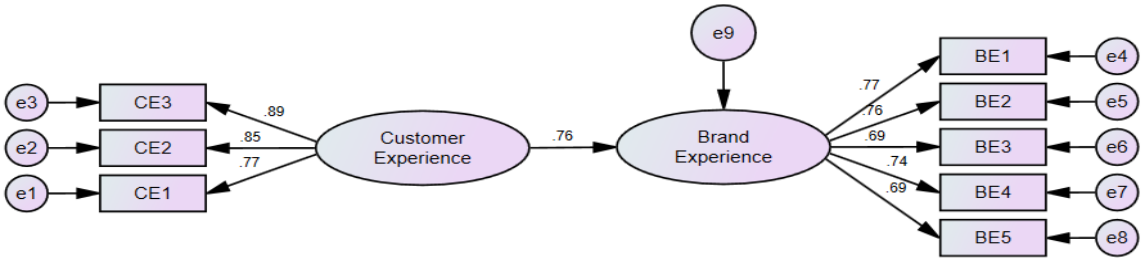

Figure 4: Impact of CE on BE

Table 6 Regression weights of CE and BE

Paths	Unstandardized	S.E.	Standardized	C.R.	P
Brand Experience <--- Customer Experience	.604	.050	.756	12.058	***

Table 6 displays an example of a potential structure equation framework that shows the independent variable, CE, and the dependent variable, BE. According to the study, A significant positive association exists between the e variables (β=.756, P<.05). The C.R. value is quite high, indicating that the relationship was statistically significant. According to the fit indices, the framework fits well since the components are statistically important at a p-value greater than 0.05 (as presented in Table 7). The total model fit was evaluated using fit indices, and the findings indicated a significant positive link between consumer and BE.

Table 7 Model fit summary

Variable	CMIN	DF	CMIN/DF	p-value	GFI	RFI	NFI	IFI	CFI	RMR	RMSEA
Value	43.982	19	2.315	0.059	0.972	0.959	0.973	0.984	0.984	0.022	0.059

A model fit summary is presented in Table 7 above; from the table, it is observable that the quality of fit for the data was good; GFI, RFI, NFI, IFI, and CFI have significantly more than 0.90 values. Additionally, the RMR and RMSEA levels fall below the critical 0.080 threshold. The findings showed that the given model suited the data well, including RMSEA, RMR, GFI, and CFI.

H3: Customer Experience positively influence Customer Retention

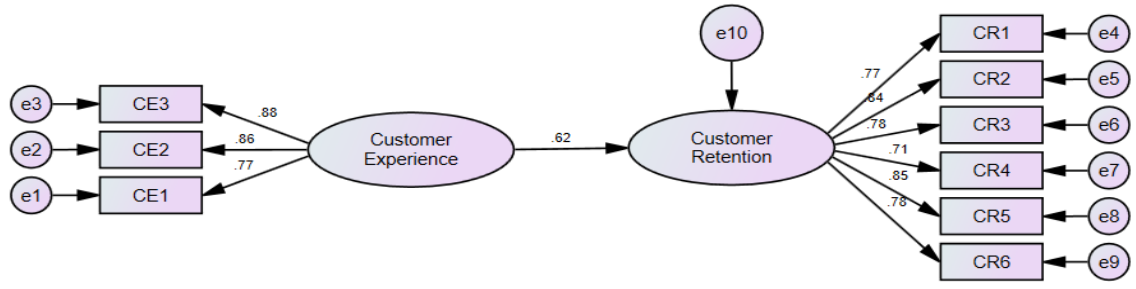

Figure 5 Impact of CE on CR

Table 8 Regression weights of CE and CR

Paths	Unstandardized	S.E.	Standardized	C.R.	P
Customer Retention <--- Customer Experience	.558	.054	.616	10.260	***

Table 8 presents a theoretical structural equation model depicting the mutual dependence between Consumer Communication, the dependent variable, alongside the independent one, Customer Loyalty. The study demonstrates a moderately notable favourable correlation between the variables (β=0.616, P<.05). The C.R. value is relatively elevated, showing that the correlation was statistically meaningful. Given that each element is statistically significant and the p-value is higher than 0.05, the fit indicators show that the hypothesis fits well (as outlined in Table 9). Customer devotion and engagement were strongly positively correlated, according to the findings of an evaluation of the overall model alignments using seven different fit indicators.

Table 9 Model fit summary

Variable	CMIN	DF	CMIN/DF	p-value	GFI	RFI	NFI	IFI	CFI	RMR	RMSEA
Value	68.913	26	2.650	0.073	0.961	0.956	0.968	0.980	0.980	0.024	0.066

A model fit summary is presented in Table 9 above; from the table, it is observable that the quality of fit for the data was good; values for GFI, RFI, NFI, IFI, and CFI are much more than 0.90. Similarly, the RMR and RMSEA values remain below the essential benchmark of 0.080. The findings disclosed a strong alignment for the model, including GFI, CFI, RMR, and RMSEA.

H4: Brand Awareness mediates the effect of Gameful experience on Customer retention.

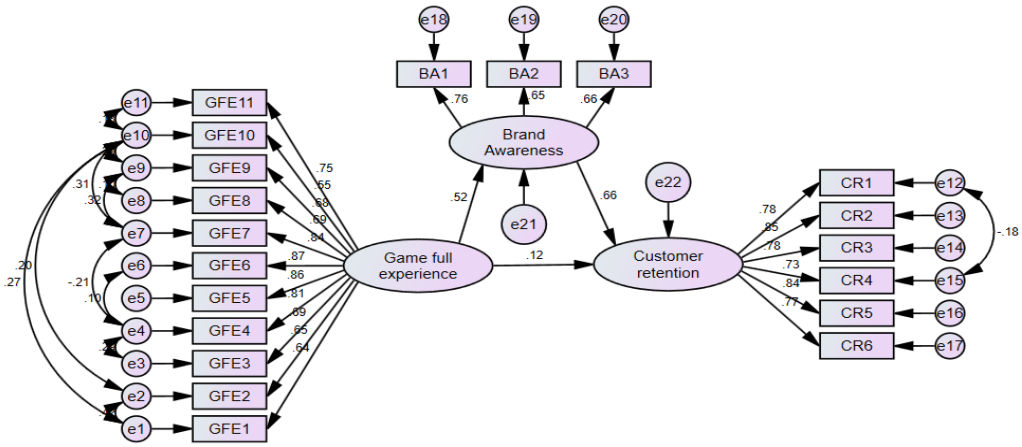

Figure 6 Mediating Effect of BA

Table 10: Regression weights of GFE, BA and CR

Paths	Unstandardized	S.E.	Standardized	C.R.	P
Brand Awareness <--- Gameful experience	.580	.075	.522	7.764	***
Customer retention <--- Gameful experience	.160	.076	.123	2.122	.034
Customer retention <--- Brand Awareness	.772	.091	.656	8.502	***

Table 10 displays the structural equation model that uses BA as the mediator to evaluate the relationship between CR and GFE. This approach incorporates feedback and measurement mistakes into the model. and evaluates all significant pathways. According to the fit indices, the model fits well, with statistically significant components. Global fit measures, including seven distinct fit indices and 'r' values, were used to evaluate the model fit and determine the consistency between the suggested model and the information. According to table 15's findings, there is a significant correlation between gaming and retention of clients. The full experience is mediated by brand awareness. There is a substantial correlation between the retention of clients and the full experience. (p-value < 0.05), with a path coefficient of 0.123. GFE and BA substantially correlate, with a path coefficient 0.522. (p-value < 0.05). The path coefficient from BA to CR is 0.656, and the association is significant (p-value < 0.05).

Mediating Analysis

Table 11 Direct and Indirect effect table

Relationships	Direct Effect of GameFul experience	Indirect Effect of Gameful experience	Confidence Interval		P-Value
			LB	WEB	
Customer Retention <--- Brand Awareness <--- Gameful experience	.123	.342	.257	.426	.030

The research examined the role of intervening BA in the connection between the retention of clients and gameful immersion. The results disclosed a remarkable indirect impact, signifying that CR driven by GFEis positively and significantly impacted by experience. notably influenced by BA (β= 0.342, p = .030). Furthermore, the immediate impact of Gameful When the middleman was present, the experience with CR was likewise identified as essential (β= 0.123, p = .019). Hence, it may be inferred that BA influences the link between Gameful Customer retention and experience. The conclusions of the mediation assessment are summarised in Table 11.

Table 12 Model fit summary

Variable	CMIN	DF	CMIN/DF	p-val	GFI	RFI	NFI	IFI	CFI	RMR	RMSEA
Value	450.668	155	2.908	0.061	0.908	0.902	0.912	0.940	0.940	0.040	0.071

The model fit summary is presented in the above table 12. From the table, it is observable that the quality of fit for the data was excellent; GFI, RFI, NFI, IFI, and CFI values are all much greater than 0.90. Similarly, the numbers for RMR and RMSEA remain below the essential limit of 0.080. The findings demonstrated a favourable alignment for the model presented, encompassing RMSEA, RMR, GFI, and CFI.

H5: Customer contentment influences the connection between the Game's complete experience and Customer loyalty.

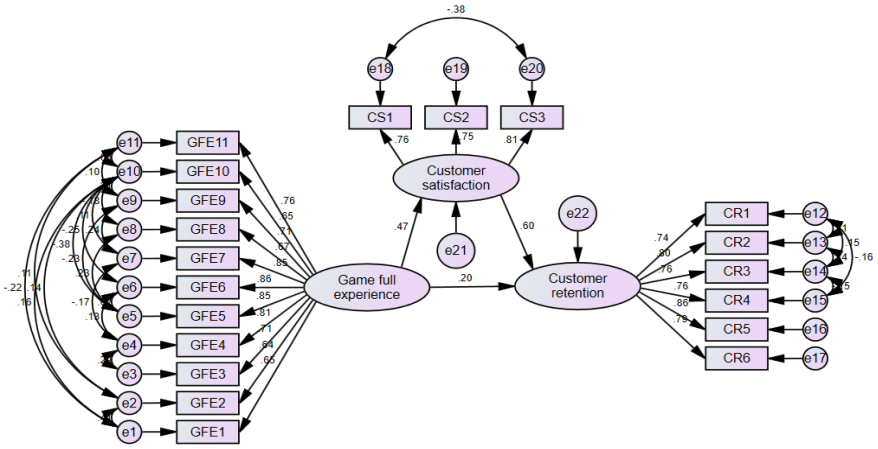

Figure 7 Mediation Analysis Customer Satisfaction

Table 13 Regression weights of GFE, BA and CR

Paths	Unstandardized	S.E.	Standardized	C.R.	P
Customer Satisfaction <--- Gameful experience	.540	.072	.473	7.517	***
Customer retention <--- Gameful experience	.248	.065	.205	3.827	***
Customer retention <--- Customer Satisfaction	.635	.078	.598	8.121	***

The conceptual equation model assessing the connection between GFE and CR, utilizing CS as a bridging variable, appears in Table 13. This method examines all essential pathways and integrates estimation inaccuracies and responses into the framework. The compatibility indicators indicate that the structure aligns properly with mathematically notable components. The framework alignment was analyzed employing universal coherence metrics, encompassing seven unique compatibility indicators and 'r' values, to establish the consistency between the projected structure and the accessible information. Insights from Table 14 demonstrate a strong relationship between CR and GFE. As influenced by Customer Awareness. The path coefficient from GFE to CR is 0.205, and the relation is significant (p-value < 0.05). The path coefficient from Gameful Customer satisfaction and experience have a substantial correlation of 0.473. (p-value < 0.05). The path coefficient from CS to CR is 0.598, and the association is significant (p-value < 0.05).

Mediating Analysis

Table 14 Direct and Indirect Effects Table

Relationships	Direct Effect of Gameful experience	Indirect Effect of Gameful experience	Confidence Interval		P-Value
			LB	UB	
Customer Retention <--- Customer Satisfaction <--- Gameful experience	.205	.283	.192	.362	.014

The study examined how customer happiness affected the link between GFE and CR. The findings demonstrated a considerable indirect effect, demonstrating that the impact of GFE on CR was positively and substantially mediated by CS. (β = 0.283, p =.014). Additionally, when the moderator was present, the direct impact of full game participation on CR was likewise identified as substantial (β = 0.205, p = 0.010). Hence, it may be inferred that CS influences the link between Gameful Customer retention and experience.

Table 15 Model fit summary

Variable	CMIN	DF	CMIN/DF	p-val	GFI	RFI	NFI	IFI	CFI	RMR	RMSEA
Value	403.892	142	2.844	0.083	0.911	0.901	0.924	0.949	0.949	0.035	0.069

A model fit summary is presented in Table 15 above; from the table, it is observable that the quality of fit for the data was good; the values of GFI, RFI, NFI, IFI, and CFI are all noticeably more than 0.90. Likewise, the RMR and RMSEA levels fall below the critical 0.080 threshold. The findings showed that the given model suited the data well. including RMSEA, RMR, GFI, and CFI

6. DISCUSSION

This section analyzes the research findings, illustrating the connections of GFE to Customer satisfaction, client retention, experience, and brand awareness. Based on an evaluation, several key insights were identified that both improve conceptual comprehension and are relevant in practice to user involvement and retention approaches.

6.1 The Role of Gameful Experience in Enhancing Customer Experience

The study's findings validate a strong beneficial connection between GFE and CE, with a standardized coefficient of $\beta = 0.567$. The result emphasizes that captivating and interactive gaming experiences shape user perceptions and engagement with the brand. The notable p-value ($p< 0.05$) highlights the significance of experiential components in enhancing customer fulfilment. From a conceptual standpoint, this aligns well with SDT, through which fundamental psychological requirements such as autonomy and proficiency can be met via gamified elements and boost inherent motivation. Leaderboards and points cultivate a sense of accomplishment, satisfying competence requirements and enriching CEs. This outcome corresponds with Beldad and Hegner (2018), who indicated that perceived usefulness and simplicity influence the sustained adoption of the applications. Furthermore, it aligns with Bitrián, Buil and Catalán (2021), who found that satisfying psychological needs through engaging components can significantly increase user engagement.

6.2 Customer Experience as a Catalyst for Brand Experience and Customer Retention

It is demonstrated ($\beta = 0.756$) that positive CEs lead to positive brand perceptions, indicating that brand perceptions are significantly influenced by positive CE. It is consistent with Aaker's (1991) design, which concludes that a good CE can lead to favourable brand association. This relationship is grounded in Keller's Brand Equity Model, which places experiential touchpoints as central to creating brand salience and loyalty. These touchpoints, gamified customer experiences, reinforce emotional connexions and favourable brand associations. Additionally, a significant path from the CE to CR ($\beta=0.616$) confirms that Improved customer satisfaction increases client retention and loyalty. Its reinforcement further validates that businesses should invest in customer journeys through such ventures. Verhoef et al. (2003) contended that positive customer experiences enhance the likelihood of retention.

6.3 Mediating Influence of Brand Awareness

The interaction between Gameful Experiencing and the customer is mediated by brand awareness. Retention (indirect effect $\beta=0.342$) with substantial implications for marketing strategies. As highlighted by Ludovino Ferreira (2021), brand awareness is important because technology helps retain customers by enhancing brand visibility. This explanation is similar to SDT's relatedness component, which describes how devising a forum for sharing narratives via gamified elements like community challenges strengthens the brand's awareness. Brand Awareness is an in-between

mechanism for those gameful experiences to contribute, in turn, to longer-term engagement and retention. These findings imply that organizations have to not only focus on improving the game experience but also make sure that this game experience advances the building of a brand name. To impact retention most, it's important to integrate brand messaging into gameplay by Keller's (1993) brand equity model.

6.4 Customer Satisfaction as a Critical Mediator

The analysis revealed that GFE has Customer satisfaction has a major mediating function in the process of Gameful Satisfaction and Loyalty of Customers with the direct impact of $\beta = 0.283$. SDT's competence, autonomy, and relatedness elevate satisfaction by promoting achievement, control, and connexion. By creating these experiences that make users feel valued, empowered and connected, users will keep using the application and remain retained. This corresponds with Oliver (1999) and Anderson and Sullivan (2003), who identified Customer pleasure as a foundation for fostering loyalty and retention. Similarly, insights from Huang and Ren (2020) about how exercise self-efficacy can mediate exercise's effect on motivation and exercise enjoyment can also be applicable in this context; if we ensure that gamification features will increase user satisfaction, we can implement better retention strategies.

6.5 Practical Implications

The findings of this study highlight the importance and relevance of gamification in enhancing user loyalty for fitness application brands. This suggests practitioners adopt multifaceted gamification strategies to engage and motivate users by including various gamification elements like points, badges, and leaderboards. The theoretical foundation of SDT offers an understanding of how provided gamification elements assist in the satisfaction of psychological needs and are thus essential to user engagement strategies. In this case, a brand must prioritize user experience by constructing and designing the app to be intuitive and personalized to different user profiles. Continuous monitoring and analysis of user feedback will empower companies to improve their gamification approach and keep things relevant and highly useful. In addition, there is also the option of implementing loyalty programmes that would reward sustained engagement to further cement user commitment. Aligning gamification with customer satisfaction metrics allows fitness app brands to formulate a compelling value proposition that is attractive to customers but also develops a level of loyalty that leads to long-term retention, thus increasing business performance overall.

6.6 Limitations and Future Research Directions

Multiple factors constrain this research, which needs to be considered for future research. The research mostly focuses on one fitness application with a participant count of 384, thereby restricting the applicability of the results to different fitness platforms or broader user groups. Furthermore, the study is primarily focused on customer experience dimensions, possibly taking other important factors that influence the inclusion of customer retention. Research on integrating motivational and demographic factors in the study of user adherence could provide learning useful for using gamification techniques in fitness applications. Future research should perform a longitudinal analysis as gamification is expansive and would help understand its dynamics over time, given its relationship with customer retention. Qualitative methodologies like in-depth interviews could enrich the data by capturing detailed user insight and experience. In contrast, a blended technique integrating descriptive and numerical data could assist. Finally, if other fitness apps, in addition to the app used for this research, were to be included in the data-gathering procedure, it would give a wider perspective regarding gamification practices and their effectiveness, ultimately enhancing the applicability and depth of future studies in this field.

7. CONCLUSION:

The objective of this study is to show how gamification can address the problem of lack of customer loyalty, poor brand perception, and bad user experience within the mobile fitness applications. Based on SDT, the research empirically demonstrated that, while gameful elements like leaderboards, badges, points, can enhance engagement, they also fulfill core psychological needs of autonomy, competence and relatedness and thus lead to greater user satisfaction and emotional bond with the brand. Secondly, this study finds the interactive experiences positively predict customer retention while brand awareness and customer satisfaction are found to be significant mediators between the two, demonstrating how gamification impacts on a customer's entire customer journey beyond a single contact. What's interesting is that there were no significant moderation effect of demographic variables, such as age, income and education, on the effects of gamification, which makes gamification applicable to a broad group of users and their demographic strata. Using gamification meaningfully in app design, fitness brands have the potential to craft richer, more personalized and emotionally resonant user experiences. This helps in both immediate interaction and brand equity, longer term commitment and customer retention. Thus, this research provides both theoretical insight and pragmatic guidance to fitness app brands and health-tech app developers who want to start building a sustainable engagement in a fast becoming saturated and competitive digital wellness landscape.

8. Ethical Considerations

This research was carried out in adherence to ethical standards for human participant research. All respondents were informed consent and participation was voluntary. To keep privacy and confidentiality, all data were anonymized.

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