Exploring the Role of Gamified Branded Apps in Shaping Green Consumption Values: The Influence of Perceived Usefulness and Playfulness

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Abstract

This study explores the role of gamified branded apps in fostering green consumption values by enhancing consumer engagement. Gamification, the integration of game-like elements into non-game contexts, has been increasingly employed in marketing strategies to engage users through interactive and rewarding experiences. This research aims to investigate the relationship between gamification, perceived playfulness, perceived usefulness, branded app engagement, and green consumption values. A survey was conducted using a sample of 700 respondents, and Covariance Based - Structural Equation Modeling (CB - SEM) was applied to assess the relationships between these constructs. The findings reveal that gamification significantly enhances perceived playfulness and usefulness, both of which positively affect consumer engagement with the branded app. However, the direct effect of gamification on branded app engagement was found to be non-significant. Importantly, branded app engagement was shown to have a strong direct effect on green consumption values, highlighting the potential of gamified apps to promote sustainable behaviors.

Keywords: Gamification, Branded App, Green Consumption Values, Perceived Playfulness, Perceived Usefulness.

1. Introduction

The integration of gamification in marketing strategies has earned significant attention in recent years, driven by its potential to enhance consumer engagement and influence purchasing behavior (Hamari et al., 2014; Huotari & Hamari, 2017). Gamification, defined as the application of game mechanics in non-game contexts, is widely recognized for its ability to create interactive and immersive experiences, thereby fostering stronger emotional connections between consumers and brands (Bittner & Schipper, 2014). By incorporating game-like elements, such as points, badges, leaderboards, and rewards, gamified branded apps engage consumers in a playful and rewarding environment, motivating them to interact with the brand repeatedly (Hofacker et al., 2022). These interactions are believed to lead to higher brand loyalty, increased consumer engagement, and, ultimately, a more positive consumer experience (Robson et al., 2015; Eppmann et al., 2018).

The aim of this study is to examine whether gamification within branded apps can promote sustainable consumption behaviors by influencing key consumer perceptions. Specifically, it explores the relationships between gamification, perceived playfulness, perceived usefulness, branded app engagement, and green consumption values. The primary research question guiding this study is: How does gamification in branded apps shape green consumption values through perceptions of playfulness and usefulness, as well as subsequent engagement with the branded app?

Branded apps offer a unique opportunity for businesses to engage with consumers through digital platforms. As the use of mobile devices continues to grow, branded apps have become powerful tools for promoting consumer engagement, enhancing brand awareness, and facilitating customer interactions (Harwood & Garry, 2015). However, the role of gamification in influencing consumer behavior within branded apps has not been fully explored, particularly in terms of how it impacts consumer engagement and sustainability values (Xi & Hamari, 2019). Research has shown that gamification strategies can enhance consumer experiences and

drive engagement, but the potential for these strategies to foster eco-friendly behaviors and green consumption values remains an area in need of further investigation (Hsu & Chen, 2018; Hofacker et al., 2022).

While this study primarily explores the immediate effects of gamification on engagement and green consumption values, it also considers its potential to foster long-term green behaviors. By focusing on both hedonic and utilitarian elements of gamification, this research aims to provide insights for app developers and marketers seeking to promote sustainable practices through gamified platforms.

The rise of sustainable consumption and the growing importance of eco-friendly behaviors have prompted brands to seek new ways to influence consumer values. Green consumption values reflect a consumer's preference for environmentally friendly products and behaviors, influenced by their awareness of the environmental impact of their consumption habits (Xu et al., 2022). Previous studies have shown that digital platforms can be effective in promoting green consumption, but the specific role of gamified branded apps in this process is still unclear (Bittner & Schipper, 2014; Xi & Hamari, 2019). While gamification has been widely studied in terms of its impact on consumer engagement, few studies have explored its potential to encourage sustainable behaviors (Hamari et al., 2014).

This exploratory study aims to fill this gap by examining the relationship between gamification, branded app engagement, and green consumption values. Specifically, this research will investigate how gamification influences perceived playfulness and perceived usefulness within branded apps, and how these constructs impact consumer engagement and the creation of green consumption values. Using structural equation modeling (SEM), this study will test the direct and indirect effects of gamification on consumer engagement and green consumption values, contributing to the growing body of literature on gamification, sustainability, and digital marketing strategies (Eppmann et al., 2018; Xu et al., 2022).

By addressing these questions, this study seeks to provide new insights into how gamified branded apps can be designed to foster deeper consumer engagement and promote green consumption values. The findings will offer practical implications for marketers and app developers looking to leverage gamification as a tool to influence consumer values and behaviors. This research not only extends the understanding of gamification in marketing but also highlights its potential role in promoting sustainability within the digital marketplace.

2. Theoretical Background and Hypotheses development

2.1. Gamification in branded app: the role of perceived playfulness and usefulness.

Gamification involves adding game-like features such as rewards, levels, points, stories, and challenges to systems (Huotari and Hamari, 2017). This approach applies gaming techniques in non-gaming contexts to enhance customer engagement and enjoyment (Hamari et al., 2019). Research has shown that gamification effectively motivates users to engage and complete tasks across various settings (Behl et al., 2022). It creates engaging experiences that spark users' interest in specific areas and increases their involvement with the system (Huotari and Hamari, 2017). For example, Nike's Nike Run Club app leverages gamification by tracking running performance, offering challenges, and rewarding user milestones, thereby fostering engagement with the brand while promoting health-conscious behaviors. Similarly, Starbucks' app encourages sustainable practices by rewarding customers for using reusable cups, demonstrating how gamified systems can combine engagement with green values.

As smartphones gain popularity, user focus on experience and perception is intensifying (Lin et al., 2022). The user experience with a gamified mobile app is complex, characterized by a broad spectrum of feelings and perceptions (Habachi et al., 2024). To systematically analyze

this complexity, Eppmann et al. (2018) introduced the Gameful Experience Scale (GAMEX). This validated tool effectively measures the emotional and engagement qualities in gamified interactions through several key dimensions: enjoyment, absorption, creative thinking, activation, absence of negative affect, and dominance. Thus, gamification extends beyond entertainment, applying game elements to real-world goals and challenges to optimize user experiences (Palmer et al., 2012). This approach highlights the psychological benefits of gamification, enhancing both hedonic aspects, such as perceived playfulness, and utilitarian aspects, like perceived usefulness.
Perceived playfulness is the enjoyment a user finds in a system, regardless of the system's performance (Venkatesh, 2000). Since people naturally enjoy playful experiences, mobile apps with games and prizes typically boost the level of playfulness during use (Hsieh et al., 2021). Similarly, perceived usefulness is defined as the belief that using a system will improve job performance, a critical factor in technology adoption (Davis, 1989; Al-Nabhani et al., 2022). Therefore, a gamified mobile app that leverages utilitarian benefits often enhances the perception of usefulness (Won et al. 2023).

To stay competitive and ahead in the market, many brands are now developing and launching their own branded mobile apps, such as Nike's Nike Run Club (Habachi et al., 2024). These apps are revolutionizing omnichannel marketing strategies by serving as critical touchpoints that influence consumer behavior and purchase patterns. Companies use these apps to provide unique, staff-free customer experiences (Hsieh et al., 2021; Newman et al., 2018) and focus on sustaining customer engagement (Kim et al., 2013). However, Users typically lose interest in branded apps shortly after trying them (Stragier et al., 2016). In response, several companies are incorporating gamification into their apps to enhance engagement and retention (Habachi et al., 2024). Research has shown that perceived playfulness and perceived usefulness significantly boost user engagement (Lin et al., 2022; McLean, 2018). Accordingly, gamification as a new technology must be perceived as both useful and playful, aligning with the nature of the technology (Behl et al., 2022). Moreover, it must foster engagement with the branded app to address the issue of branded app abandonment (Stragier et al., 2016). At the same time, branded apps themselves must also be perceived as useful and enjoyable (Kim et al., 2013; Mostafavi & Mavrommatis, 2024).

Thus, we hypothesize:

H1a. Gamification positively affects perceived playfulness.

H1b. Gamification positively affects Branded app engagement.

H1c. Gamification positively affects perceived usefulness.

H2. Perceived playfulness positively affects engagement with the branded app.

H3. Perceived usefulness positively affects engagement with the branded app.

2.2. Green consumption values fostered by branded app

Green Consumption Values (GCV) reflect a consumer's concern for the environment and their desire to minimize their negative environmental impact through their purchase and consumption behaviors (Haws et al., 2014). Consumers who hold strong green consumption values are more likely to seek out eco-friendly products, invest in sustainable brands, and make purchasing decisions that reflect their environmental ethics (do Paço et al., 2019; Groening et al., 2018). Studies have shown that green consumers tend to prioritize environmental impact when making purchase decisions and are often willing to pay a premium for products that are marketed as sustainable (Chan, 2001; Sarkar et al., 2019).

From a marketing perspective, consumers with green values demand transparency and authenticity in a brand's environmental efforts (Papista & Dimitriadis, 2019). Companies that are able to demonstrate their commitment to sustainability through their products and services tend to foster stronger loyalty among green consumers (Huang et al., 2014; Nguyen et al., 2019). This is particularly relevant as businesses integrate sustainability into their core digital branding strategies, influencing green consumers by highlighting the eco-friendly aspects of their offerings (do Paço et al., 2019).

Thus, we hypothesize:

H4: Branded app engagement positively affects green consumption values.

3. Methodology

The survey examined five constructs—gamification, branded app engagement, perceived playfulness, perceived usefulness, and green consumption values—using validated item scales. Following previous studies (e.g., Hamari et al., 2014; Eppmann et al., 2018), the measurement items were adapted to fit the context of gamified branded apps. All constructs were measured using a 5-point Likert scale ranging from "strongly disagree" to "strongly agree." The survey was conducted in Italy through Google Forms between June 2024 and September 2024, collecting responses through digital platforms such as social media, online forums, and branded app communities. A non-random sample of 700 respondents voluntarily participated in the study. The demographic profile of the sample, including age, gender, and geographic location, was diverse, ensuring a wide representation of consumers. Participants were informed about the study's objectives and their consent was obtained, ensuring data confidentiality.

3.1. Data Analysis

To validate the multi-item scales and ensure the measurement model's reliability, Confirmatory Factor Analysis (CFA) was conducted using AMOS. The standardized loadings for each construct were above the recommended threshold of 0.70 (Hair et al., 2019), indicating good convergent validity. Gamification (Gamex): The latent variable representing gamification (composed of 27 items) was measured through multiple dimensions such as enjoyment, absorption, creative thinking, Activation, absence of negative affect and dominance with factor loadings ranging from 0.934 to 1.000. The construct reliability (CR) for gamification was 0.987, with an Average Variance Extracted (AVE) of 0.938. The CR for BAE was 0.980, and the AVE was 0.909, indicating strong internal consistency. Perceived Usefulness (PU): The usefulness of the gamified branded app was measured through nine items, with factor loadings between 0.965 and 1.054. The CR for PU was 1.003, and the AVE was 1.027. Perceived Playfulness (PP): This construct was assessed through nine items, with factor loadings between 0.979 and 1.027. The CR for perceived playfulness was 1.006, and the AVE was 1.054, indicating high reliability. Branded App Engagement (BAE): This construct was measured using five items related to app usage and engagement with factor loadings ranging from 0.913 to 1.000. Green Consumption Values (GCV): Green consumption values were measured through six items related to environmentally responsible behaviors, with loadings between 0.908 and 1.000. The CR for GCV was 0.986, with an AVE of 0.922.

3.2. Structural Equation Modeling

Covariance-Based Structural Equation Modeling (SEM) was employed to test the hypothesized relationships among the constructs. SEM was chosen due to its capacity to simultaneously assess both the measurement and structural models, making it suitable for exploring complex

relationships between multiple variables (Hair et al., 2019). The model fit indices demonstrated excellent fit (CMIN/DF = 1.102; CFI = 0.996; RMSEA = 0.012), indicating that the hypothesized relationships were well supported by the data. To address potential common method bias, both ex-ante and ex-post procedures were applied. Anonymity was ensured, and items were pre-tested for clarity. A latent method factor was included in the CFA, and results indicated that common method bias was negligible.

4. Findings

The importance of environmental sustainability has prompted a growing interest in how digital tools, particularly gamified branded apps, can influence consumer behaviors and green consumption values. With the proliferation of mobile applications, companies are adopting gamification techniques—such as rewards, points, and challenges—to increase user engagement and encourage green behaviors (Hamari et al., 2014; Huotari & Hamari, 2017). Our study contributes to this literature by examining the role of gamified branded apps in fostering green consumption values through consumer engagement.

By leveraging game mechanics, branded apps offer unique opportunities for brands to build relationships with consumers, encouraging repeated interactions in a playful and immersive environment (Bittner & Schipper, 2014). However, despite the wide adoption of gamification in marketing strategies, few studies have explored the relationship between branded app engagement and the promotion of sustainability values. This research aims to address this gap by analyzing the impact of gamification on perceived playfulness, perceived usefulness, and branded app engagement, and how these constructs influence green consumption values.

Our findings (Table 1) indicate that gamification significantly enhances both perceived playfulness and perceived usefulness; moreover, its direct impact on branded app engagement was also found to be significant. However, branded app engagement had a strong direct effect on green consumption values, suggesting that sustained interaction with gamified apps is crucial for fostering eco-friendly behaviors. These results suggest that brands should focus on gamification strategies that encourage long-term engagement, such as progressive challenges, recurring rewards, and personalized green features. Such strategies could amplify the impact of gamified apps on fostering green values over time.

Table 1: Structural Equation Model (SEM) Results

Path	Standardized Estimate	S.E.	C.R.	P-value	Hypothesis Supported
Gamification → Perceived Usefulness (PU)	0,807	0,38	23,835	***	Yes
Gamification → Branded App Engagement (BAE)	0,276	0,096	2,888	0,004	Yes
Gamification → Perceived Playfulness (PP)	0,897	0,038	23,835	***	Yes
PU → Branded App Engagement (BAE)	0,197	0,077	2,564	0,010	Yes
PP → BAE	0,258	0,070	3,710	***	Yes

BAE → Green Consumption Values (GCV)	0,905	0,038	23,727	***	Yes

On one hand, there is the challenge of instilling green values in customers. On the other hand, brands are using their gamified branded apps to continuously draw customers back. This strategy involves not only initially attracting customers but also keeping them engaged and returning effectively. However, research on how gamification in branded apps can facilitate the adoption of green values is limited. In this study, we aim to address this question using Covariance – Based Structural Equation Modeling (CB - SEM).

First, we found that using gamification in branded apps positively influences customers' perceptions of playfulness and usefulness (Lin et al., 2022; Won et al., 2023). Second, our findings indicate that increased perceived playfulness and usefulness lead to heightened engagement with the app (Lin et al., 2022; McLean, 2018). This supports the idea that gamification is becoming a popular strategy to enhance user engagement across various contexts (Mekler et al., 2017). Finally, we observed that higher engagement with gamified branded apps is associated with greater adoption of green values, aligning with Prakash and Manchanda (2021), who argue that gamification is an effective and sustainable method to advance social benefits.

5. Conclusion and implications for research and management

This study explored how gamified elements influence perceived playfulness and usefulness, finding that these elements boost engagement with branded apps. This enhanced engagement encourages customers to adopt green values. Additionally, the research indicates that gamification is essential for the success of brands' green strategies.

From a theoretical perspective, this study extends the understanding of gamification by highlighting its role not just in enhancing engagement but also in shaping value-driven behaviors such as sustainability. The dual role of perceived playfulness and usefulness as drivers of engagement underscores the importance of both hedonic and utilitarian factors in gamified systems. By integrating these dimensions, brands can create a more comprehensive approach to influence consumer values and behaviors, contributing to the gamification and sustainability literature. Future research should explore how these relationships evolve over time and examine the influence of cultural and regional differences on gamified app adoption and engagement.

Our study underscores critical managerial implications, particularly highlighting the potential of gamified branded apps to instil green values among users. Firstly, our findings suggest that gamification within branded apps significantly enhances the adoption of green values. Managers should consider embedding features that promote sustainability, such as rewards for eco-friendly behaviors or challenges that encourage users to reduce their carbon footprint. For instance, apps could offer points or discounts for using reusable products or participating in community clean-up events. Many companies (e.g. Nike, Gucci, Duolingo) right now are implementing gamified branded apps, but still a lot of work is needed. Secondly, the strong correlation between user engagement and the adoption of green values indicates that ongoing user interaction is crucial. Gamification strategies should evolve over time to maintain user interest and ensure sustained behavior change. For example, introducing progressive challenges, dynamic content, or time-sensitive rewards can reinforce users' commitment to

sustainable practices. Moreover, integrating personalization features, such as green-impact tracking tailored to individual users, can create deeper emotional connections and encourage long-term engagement.

Finally, given the effectiveness of gamification in fostering green behaviors, managers have an opportunity to position their brands as leaders in environmental responsibility. By aligning gamified app strategies with corporate sustainability goals, brands can enhance their reputation and customer loyalty. Implementing features that track and visualize the environmental impact of users' actions, such as a real-time tracker of CO2 saved, can make the concept of sustainability tangible and rewarding. Specifically, having a gamified branded app that is easily accessible to consumers through their phones, teaching sustainability while simultaneously entertaining them, can be highly beneficial for the environment.

In conclusion, our research demonstrates how gamified branded apps can drive consumer engagement and foster green consumption values. By integrating more meaningful and dynamic engagement mechanisms, brands can strengthen the relationship between consumer enjoyment, perceived utility, and green behaviors. This study provides practical insights for businesses seeking to leverage gamification not just for immediate engagement but also as a long-term strategy for driving sustainable consumer practices and achieving corporate sustainability goals.

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