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Examining the impact of Gamified Advertisement on Green Buying Behaviour of Generation Z in India.

Authors: Asst. Prof. Pradeep Singh[a], Asst. Prof. Prathmesh U Tawade[b], Asst. Prof. Aditi Damle-Pawar[c], Asst. Prof. Krishnakant Lasune [d]

a. Assistant professor at Lala Lajpatrai Institute of Management, Lala Lajpatrai Marg, Mahalaxmi.
b. Assistant Professor, Dr. V.N. Bedekar Institute of Management Studies, Thane.
c. Assistant Professor, Dr. V.N. Bedekar Institute of Management Studies, Thane.
d. Assistant Professor, Dr. V.N. Bedekar Institute of Management Studies, Thane.

Abstract
This research investigates how gamified advertisements influence the green buying behavior of Generation Z in India, using Technology Acceptance Model (TAM) and extends it by Affordance theory. Data were gathered from 341 students studying at a higher education institution. The proposed model was examined with Smart PLS software. Findings confirm relevance of TAM and establish a link between Affordance theory and TAM constructs. The study offers practical insights for green marketers to design effective gamified advertising strategies targeting educated Indian millennials.

1. Introduction

There has been a global awareness of the significance of protecting environmental health over the previous few decades (Bhardwaj et al., 2020). Numerous studies have emphasised the increasing difficulties brought on by the expansion of the human population, industrial output, and consumption of non-renewable resources, and a resultant rise in related environmental consequences (Albino et al., 2009).

The current era's top research priorities for academics, practitioners, and even industrial organisations include concerns about environmental decline, reducing environmental effect, and sustainable development (Biswas, 2016). Green products and procedures are being developed via research and development to lessen the negative impacts on the environment and create a sustainable future (Yashashwini, 2021).

According to the previous research, businesses from all industries are becoming more interested in creating and marketing environmentally friendly goods. However, it is sometimes challenging for businesses to create communication strategy that would encourage customers to select these items (Tong ., 2021). This study will help of TAM will allow us to understand how gamified elements in advertisement will impact buying decision on consumers which will benefit marketers to develop a strategy.

2. Literature Review

Green Products

Products called "green" are made with the intention of using fewer natural resources, limiting harmful materials, and cutting down on waste and pollution (Tong et al., 2021). Items that can be recycled easily and are safe to dispose of are often considered green products. (Yashashwini, 2021). In light of this, the phenomenon known as "green consumerism" refers to the trend among customers to purchase goods that have been made with consideration for the environment (Shamsi & Siddiqui, 2017).

Gamification

Gamification means adding elements from games—like points, challenges, or rewards—to things that aren't games, with the goal of making a service, product, or app more engaging, motivating, and helpful for users. (García-Jurado et al., 2019). The common elements that characterised game environments include leaderboards, points, achievements, status, awards, badges, and goals (Shi et al., 2022). Gamification, according to marketers, has the ability to improve consumer engagement, brand recognition, and loyalty hence it aids in connecting with prospective customers to grow organizations and promote suitable marketing contexts (Mishra & Malhotra, 2021).

Affordance theory

Affordance refers to the different possible actions a person can take in a specific situation. It's about what options or opportunities an object or environment offers to someone (Gibson, 1979). The term "affordances" refers to a variety of game-structuring components and mechanics that support the development of game-like experiences within the systems (Koivisto & Hamari, 2019), while its relationship to various design elements in the context of advertisements for green

products has not been thoroughly studied. The concept of affordance has been used in previous research to explain how people interact with their surroundings in a variety of contexts. We will be studying the impact of implementation of affordance on consumer purchase intention towards green products.

Gamification affordance

a. Achievement affordance

Achievement affordance allows users to see gamification as an opportunity to earn rewards or feel a sense of achievement by completing tasks. When users have the opportunity to receive incentives or trophies for their engagement, they are more inclined to view their interaction with the gamified system as engaging and valuable. (H¨ogberg, Shams, & W¨astlund, 2019). Customers in the context of our study can earn coupons for future purchases by participating in the games featured in the advertisements while shopping online.

b. Competitive affordance

Competitive affordance allows users to assess their performance against that of others. A few examples of components of competitive affordance are ranking, interactive chat, team battles, and leaderboards (Shi et al., 2022). Gamification features like leaderboards let users compare their achievements with others, sparking a desire to do better and perform at their best (Leclercq, Poncin, & Hammedi, 2017). Friendly challenges among friends and family can boost competition, encourage more interaction, and strengthen social connections, leading to higher levels of social engagement among players (Dietrich, Mulcahy, & Knox, 2018).

c. Identity affordance

Identity affordance enables users to distinguish themselves from others by overcoming challenges or accomplishing milestones. Elements of Identity affordances include points, scoring, levelling, leaderboards, progression bars, badges, and trophies (Shi et al., 2022). When users progress in a gamified system—by reaching new levels or achieving goals—they often experience a boost in their sense of identity and reputation, feeling more recognized and valued within the community (Hammedi et al., 2019).

Technology Acceptance model

The Technology Acceptance Model, or TAM, has been widely supported by research and is often used as a key framework for understanding how people adopt new technologies. Building on this, Venkatesh and Davis recognized how important perceived usefulness is in shaping users' intentions, so they expanded the model by adding new factors that influence this perception. This led to the creation of an updated version called TAM2.

3. Hypothesis development

Table 1 provides definitions for each construct that make up the theoretical basis of the study, although not all of them were examined in a single study, the majority of them were found in earlier studies.

Table 1. Description of Constructs

Constructs	Label	Theory	Definition in the context of Gamified Environment
Achievement Affordance	AA	AT	The affordance that helps someone see gamification as a way to feel accomplished or earn rewards for finishing certain tasks or activities (Si Shi, 2021).
Identity Affordance	IA	AT	The affordance that helps someone build their own identity among others by reaching set milestones or achieving specific goals (Si Shi, 2021).
Competition Affordance	CA	AT	The affordance that lets someone compare their own performance with how others are doing (Si Shi, 2021).
Perceived ease of use	PEU	TAM	The extent to which someone feels that interacting with a gamified advertisement would be easy and require little effort (Zaineldeen et al., 2020).
Perceived usefulness	PU	TAM	The degree to which an individual believes that using gamified advertisement will be advantageous (Hu et al., 1999).

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Behavioral Intention to use	BIU	TAM	Intention of the person to purchase green product based on Gamified Advertisement (Dumpit & Fernandez, 2017).

Table 2 presents the hypotheses formulated for this study, illustrating the relationships between various variables.H1, H2, H6, H7, H8, and H9 are new and weren't included in earlier research, so a logical explanation is provided to define their connections. The other hypotheses have been explored before, but this is the first time these relationships are being examined specifically in the context of gamified advertising for green products.

Table 2. Hypotheses development

Label	Link	Relation	Theory support / Logical argument
H1	GA→ PU	+ve	The more the person is able to perform activity through gamified Ads, the more likely it is that the user will consider the Gamified Advertisement to be useful.
H2	GA→ PEU	+ve	The more the person is able to perform activity through gamified Ads, the more likely it is that the user will consider the Gamified Advertisement to be easy to use.
H3	PEU→PU	+ve	(Jalil Shah Scholar & Attiq, 2015), (Ramayah & Ignatius, 2005),(Ramayah & Ignatius, 2005),(Nikou & Economides, 2017)
H4	PEU→BIU	+ve	(Al-Aulamie et al., 2012), (Nikou & Economides, 2017), (Holden & Karsh, 2010), (Dumpit & Fernandez, 2017)
H5	PU→BIU	+ve	(Nikou & Economides, 2017), (Fathema, 2015)
H6	GA→BIU	+ve	The more the person is able to perform activity through gamified Ads, the more likely it is that the user will purchase green product.
H7	GA→PEU →BIU	+ve	Perceived ease of use mediated the association between Gamification Affordance and Behavioural Intention to use.
H8	GA→PEU→PU	+ve	Perceived ease of use mediated the association between Gamification Affordance and Perceived usefulness.
H9	GA→PU→BIU	+ve	Perceived usefulness mediated the association between Gamification Affordance and Behavioural Intention to use.

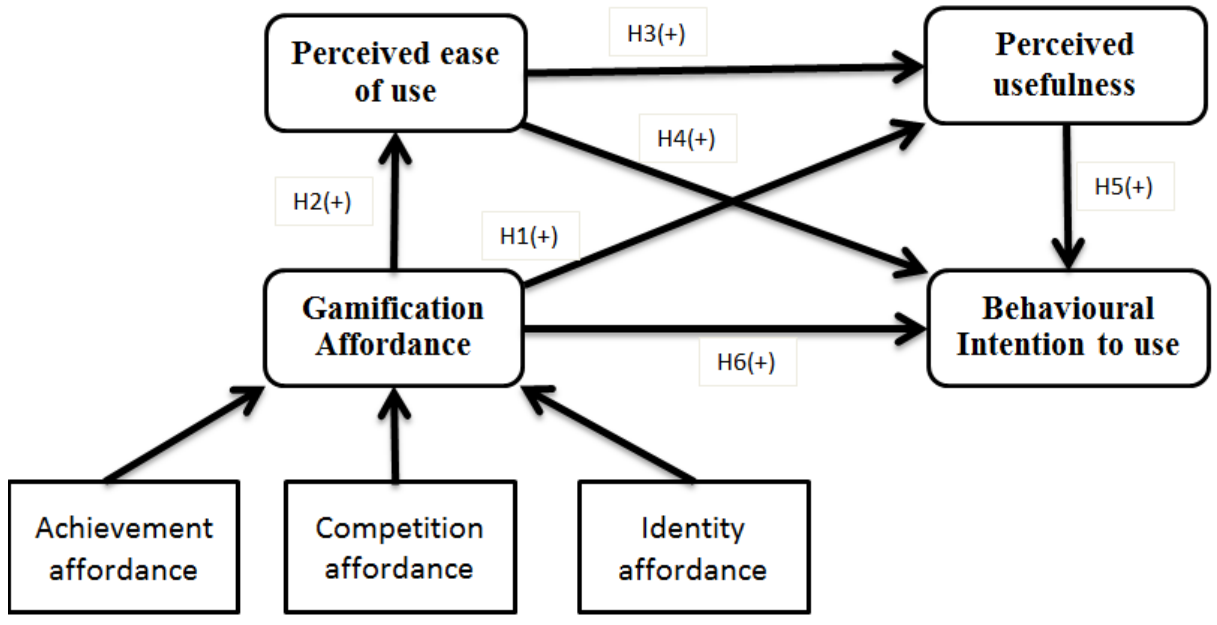

Figure 1

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4. Research Methodology and Data Analysis

The present study employed a convenience sampling method, ensuring a balanced representation of male and female participants. Data were collected through a structured questionnaire developed in alignment with the proposed theoretical framework to measure Achievement Affordance (AA), Identity Affordance (IA), Competition Affordance (CA), Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Behavioral Intention (BI). Responses were recorded on a 5-point Likert scale. The questionnaire was distributed via a Google Form (see Appendix for the instrument), which was sent to 547 individuals, with 345 completed responses deemed valid for analysis. Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM), commencing with the assessment of the measurement model, followed by the evaluation of the structural model.

a. Measurement Model

The measurement model in this study consists of seven constructs. To establish the validity and reliability of all latent variables, the reflective measurement model was assessed following the criteria outlined by Chin (2010), Hair et al. (2012), and Hair et al. (2017). Convergent validity was evaluated by examining factor loadings, composite reliability (CR), and average variance extracted (AVE), whereas discriminant validity was assessed using the Fornell-Larcker criterion.

Convergent and Discriminant Validity

Table 4.

	Convergent validity				**Discriminate validity**					
	α	**CR**	**AVE**		**AA**	**BIU**	**CA**	**IA**	**PEU**	**PU**
AA	0.846	0.907	0.764		**0.874**					
BIU	0.822	0.894	0.738		0.359	**0.859**				
CA	0.779	0.871	0.693		0.386	0.3	**0.833**			
IA	0.858	0.888	0.469		0.482	0.349	0.545	**0.848**		
PEU	0.804	0.885	0.719		0.338	0.453	0.354	0.299	**0.829**	
PU	0.773	0.869	0.688		0.327	0.597	0.261	0.292	0.608	**0.876**
After introducing second order construct.										
	α	**CR**	**AVE**		**BIU**	**GA**	**PEU**	**PU**		
BIU	0.822	0.894	0.738		**0.859**					
GA	0.704	0.83	0.62		0.542	**0.788**				
PEU	0.773	0.869	0.688		0.454	0.435	**0.829**			
PU	0.848	0.908	0.767		0.596	0.418	0.608	**0.876**		

Note: α = Loadings, **CR=** Composite reliability, **AVE=** Average extracted variance

Several items were excluded from the analysis during the measurement model evaluation due to low factor loadings (<0.600), in line with the recommendation by Gefen and Straub (2005). All composite reliability (CR) values exceeded the 0.700 threshold (Wasko & Faraj, 2005), and average variance extracted (AVE) values were above 0.500, confirming acceptable convergent validity. Table 4 displays the outcomes for reliability, validity, and item loadings. According to

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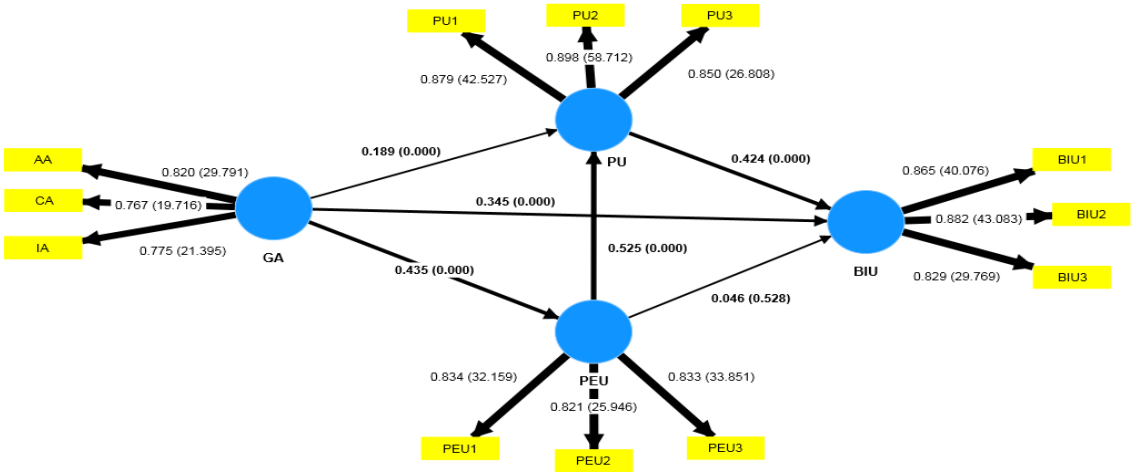
Fornell and Larcker (1981), discriminant validity is achieved when a construct's AVE square root (shown diagonally in Table 5) surpasses its correlations with other variables. Table 5 supports that discriminant validity is adequately established. Furthermore, the second-order construct was modeled using the repeated indicator approach.

b. Structural Model



*The values on outer model represents outer loading and t values. The values on inner model represents the path coefficient and p values.

Table 5

Hypothesis	Relationship	B	S.D.	T	P	Significance level
H1	GA→ PU	0.189	0.052	3.628	0	**Significant**
H2	GA→ PEU	0.435	0.052	8.354	0	**Significant**
H3	PEU→PU	0.525	0.062	8.534	0	**Significant**
H4	PEU→BIU	0.046	0.073	0.632	0.528	**Not Significant**
H5	PU→BIU	0.424	0.077	5.474	0	**Significant**
H6	GA→BIU	0.345	0.058	6.002	0	**Significant**

Table 6

Mediation Analysis					
	Indirect effect	**P-values**	**Direct effect**	**P-values**	**Decision**
H7	GA→PEU →BIU	0.528	GA →BIU	0.000	**No mediation**
H8	GA→PEU→PU	0.000	GA→PU	0.000	**Partial mediation**

H9	GA→PU→BIU	0.000	GA→BIU	0.000	**Partial mediation**

The structural model demonstrates that Gamification Affordance (GA) has a statistically significant positive effect on Perceived Usefulness (PU) ($\beta = 0.189$, $p < 0.001$), Perceived Ease of Use (PEU) ($\beta = 0.435$, $p < 0.001$), and Behavioral Intention to Use (BIU) ($\beta = 0.345$, $p < 0.001$), thereby supporting H1, H2, and H6. Furthermore, PEU significantly influences PU ($\beta = 0.525$, $p < 0.001$), confirming H3. However, the direct relationship between PEU and BIU was found to be statistically insignificant ($\beta = 0.046$, $p = 0.528$), indicating that H4 is not supported. PU positively and significantly influences BIU ($\beta = 0.424$, $p < 0.001$), thus supporting H5.

The mediation analysis further refines the understanding of these relationships. H7, which hypothesized that PEU mediates the relationship between GA and BIU, is not supported due to the non-significant indirect effect ($p = 0.528$), despite the direct effect being significant. This indicates the absence of mediation. In contrast, H8 is supported with a significant indirect effect from GA through PEU to PU ($p < 0.001$) along with a significant direct effect, indicating partial mediation. Similarly, H9 is supported with a significant indirect effect from GA through PU to BIU ($p < 0.001$) and a significant direct effect, also confirming partial mediation.

Collectively, the findings highlight the critical roles of PU and PEU in shaping consumer behavioral intention in gamified advertising for green products. While PEU alone does not directly influence BIU, it contributes indirectly by enhancing PU. The results underscore the importance of designing gamified elements that users find both easy to use and useful, thereby enhancing their willingness to engage with and act upon green product advertisements.

5. Conclusion

This study aimed to investigate the influence of gamification affordances on the advertising of green products in the context of online shopping, employing a quantitative approach grounded in the Technology Acceptance Model (TAM) and Affordance Theory. Out of the nine proposed hypotheses, seven received empirical support, providing meaningful insights into how various gamified features impact consumers' perceptions and intentions toward sustainable consumption. The findings emphasize that when gamified advertisements are perceived as useful and easy to interact with, users are more likely to form positive behavioral intentions toward green product purchases.

The results reveal that Gamification Affordance significantly enhances both Perceived Ease of Use and Perceived Usefulness, thereby affirming the role of engaging design elements—such as rewards, competition, and progress tracking—in shaping user experience and value perception. Perceived Usefulness emerged as a strong predictor of Behavioral Intention to Use, highlighting its central role in driving consumer adoption of gamified green advertisements. Although Perceived Ease of Use did not directly influence Behavioral Intention, it indirectly contributed through its positive effect on Perceived Usefulness, underlining the importance of system usability in value formation.

The mediation analysis further reinforced these dynamics, demonstrating that Perceived Ease of Use and Perceived Usefulness serve as partial mediators in the relationship between Gamification Affordance and Behavioral Intention to Use. This suggests that while gamification has a direct appeal, its impact is significantly amplified when users perceive the experience as both user-friendly and beneficial.

Overall, the study contributes to the growing body of literature on sustainable marketing by illustrating how thoughtfully designed gamified advertisements can not only engage users but also steer them toward environmentally responsible choices. These findings provide actionable insights for marketers and developers seeking to integrate gamification into digital advertising strategies to promote green consumer behavior.

6. Implications of the study

This research offers several important contributions to the academic field. First, it fills a gap by thoroughly exploring the use of gamification in promoting green products—a topic that, while touched on in past studies of various affordances, has not been specifically examined in this context. By applying Affordance Theory, this study investigates how gamified affordances can enhance customer experiences and positively impact buying behavior toward green products. The proposed theoretical framework links gamification affordance with the Technology Acceptance Model, shedding light on how game-like features encourage the adoption and purchase of sustainable products. Advertisers and campaign designers should pay closer attention to gamification elements that create enjoyable perceptions or experiences. Examples include reward systems, engaging interactivity, or leaderboards. Marketers are encouraged to incorporate interactive and competitive features so customers feel motivated to challenge themselves in gamified ads and recognize their achievements.

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