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Driving sustainable consumption: the role of green innovation, creativity and media in shaping consumers' purchase intentions in Malaysia

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Abstract

As environmental concerns continue to influence global consumer behavior, this study aims to investigate the impact of Green Innovation, Green Creativity, and Green Media on consumer Purchase Intention, with a focus on the Malaysian context. A structured survey was conducted among 312 consumers familiar with eco-friendly products, and data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to assess the relationships between constructs. The findings reveal that Green Innovation and Green Media significantly influence Purchase Intention, whereas Green Creativity does not show a direct significant effect. These results suggest that consumers prioritize functional and communicative aspects of green marketing over creative design in shaping sustainable purchasing behavior. The study contributes to the theoretical development of green marketing by offering an integrated model and highlights the practical importance of aligning green marketing strategies with consumer expectations. Implications are provided for marketers and policymakers seeking to foster environmentally responsible consumption and enhance sustainability-driven engagement in emerging markets like Malaysia.

Keywords Green marketing, Green innovation, Green creativity, Green media, Purchase intention, Sustainable consumer behavior, Environmental sustainability

JEL Classification M31, Q56, M10, O32

1 Introduction

In today's increasingly environmentally aware and highly competitive marketplace, businesses face intensifying demands to implement strategies that not only bolster their competitive advantage but also clearly demonstrate an authentic commitment to sustainability. Green marketing has emerged as a critical strategic orientation, emphasizing the conceptualization, development, communication, and promotion of eco-friendly

products, services, and operational practices. Through this approach, firms can simultaneously satisfy the growing demands of environmentally conscious consumers and contribute meaningfully to the broader societal imperative of sustainable development. As global concerns over climate change, environmental degradation, and finite resource availability continue to escalate, the relevance and urgency of adopting environmentally responsible marketing practices have significantly heightened across diverse industries and sectors. Organizations that successfully embed sustainability into their brand identity are increasingly recognized for cultivating stronger consumer loyalty, ensuring compliance with evolving regulatory frameworks, enhancing reputation, and fulfilling corporate social responsibility (CSR) commitments [27, 35].

Generational shifts in consumer values further amplify the need for strategic green marketing. Contemporary consumers, particularly Millennials and Generation Z, are substantially more inclined to prioritize ethical, socially responsible, and environmentally sustainable purchasing decisions. Research indicates that Generation Z, in particular, exhibits heightened environmental and social consciousness, with such values strongly informing their brand preferences and purchasing behaviors [31]. This evolving consumer landscape necessitates that businesses adopt marketing strategies that not only communicate product features but also reflect deeply held ethical and ecological considerations. In this context, green marketing is no longer an optional or peripheral strategy but a core requirement for competitive relevance and brand legitimacy.

Recognizing the multidimensional nature of green marketing, this study explores three fundamental constructs: Green Innovation (GI), Green Creativity (GC), and Green Media (GM). These dimensions collectively capture the product development, creative communication, and platform dissemination aspects necessary for effective green marketing. Green Innovation refers to the strategic development and implementation of products, processes, or services that yield explicit environmental benefits. Innovations such as biodegradable materials, carbon-reduction technologies, energy-efficient designs, and circular economy practices have been found to substantially influence consumer perceptions, establishing brands as credible champions of sustainability. For example, research demonstrated that innovative solutions such as shared electric transport services not only improved user adoption rates but also positively shifted societal norms around sustainable behavior [13, 23]. Green Innovation thus serves as a catalyst for reconfiguring consumption patterns and fostering eco-friendly lifestyles. Green Creativity captures the imaginative integration of environmental themes into marketing communications. By employing storytelling, visual narratives, eco-labeling, and aesthetic branding elements centered around sustainability, companies can distinguish themselves within increasingly saturated markets. Creativity imbues environmental messaging with emotional resonance, forging deeper psychological connections between brands and consumers. Empirical research confirms that creatively crafted green messages especially those aligned with personal values are more likely to enhance brand attachment, evoke trust, and elicit higher willingness to pay among consumers [15, 33]. Thus, Green Creativity acts not only as a differentiator but also as a relational mechanism that anchors consumer loyalty around shared environmental ideals. Green Media represents the strategic use of digital, social, and traditional media platforms to disseminate and reinforce green marketing messages. In an age where digital interaction dominates consumer engagement, the effective deployment of media channels is

essential for amplifying sustainability narratives. Social networks, online communities, influencer collaborations, and branded content campaigns offer dynamic avenues for promoting green initiatives. Research highlights that social media platforms, in particular, enable real-time dialogue, foster brand transparency, and cultivate communal environmental identities among consumers [24]. Strategic use of these platforms enhances message reach, authenticity, and consumer trust, thereby magnifying the overall impact of green marketing efforts.

At the core of green marketing's success lies its ability to positively influence Purchase Intention, the likelihood that consumers will opt for environmentally friendly products based on their perceptions of sustainability credibility, product trustworthiness, and emotional resonance with brand values. Numerous studies have confirmed that Purchase Intention is shaped by cognitive and affective evaluations of green marketing cues, underscoring the critical role that trust, awareness, and ethical identity play in consumer decision-making processes [44, 46]. Building upon these theoretical foundations, the present study seeks to examine the individual and interactive effects of Green Innovation, Green Creativity, and Green Media on consumer Purchase Intention. While prior studies have examined these constructs in isolation, there is a significant gap in understanding how they operate synergistically within an integrated model. By developing and empirically testing a comprehensive framework, this research aims to provide richer insights into the multifaceted ways green marketing influences consumer behavior.

The novelty of this research lies in its unified conceptualization of green marketing practices. Rather than treating innovation, creativity, and media dissemination as isolated efforts, this study proposes a holistic structural model that captures the interplay among these dimensions in shaping Purchase Intention. Employing Partial Least Squares Structural Equation Modeling (PLS-SEM) allows for robust analysis of complex causal relationships, accommodating both reflective and formative measurement constructs, and offering greater predictive accuracy. Ultimately, this study addresses the critical need for marketing scholars and practitioners to align sustainability messaging with actual consumer motivations and behaviors. It emphasizes the importance of designing green marketing initiatives that are not only innovative and creatively engaging but also effectively communicated through credible and accessible media channels. By doing so, businesses can more effectively encourage sustainable consumption patterns, contribute to environmental stewardship, and remain competitive in an era where sustainability is both a market demand and a moral imperative. The expected contributions of this study extend beyond theoretical advancement, offering actionable insights for marketers, brand managers, and policymakers aiming to promote responsible consumerism. The findings are anticipated to provide strategic guidance on integrating green innovation, creativity, and media usage into cohesive campaigns that resonate with evolving consumer expectations, ultimately facilitating the broader transition toward sustainable practices.

Despite the increasing global interest in green marketing, there remains a critical need to understand how different green marketing components function collectively, particularly in developing economies like Malaysia [11, 39]. As the country transitions toward a sustainability-driven economic agenda, consumers are exposed to a growing number of eco-friendly products and promotional campaigns [27, 40]. However, existing research tends to examine green marketing elements such as innovation, creativity, and media in

isolation, without considering how they interact to influence consumer behavior. This study addresses this gap by proposing an integrated framework that simultaneously evaluates Green Innovation, Green Creativity, and Green Media as drivers of Purchase Intention. The novelty of this research lies in its unified model and its application of the Theory of Planned Behavior (TPB) to explain sustainable consumer decisions. By focusing on Malaysia, the study also provides regional insights into consumer responsiveness to green marketing strategies in an emerging market context.

Moreover, Malaysia provides a compelling context for investigating sustainable consumption and green marketing strategies. As a rapidly developing Southeast Asian nation, Malaysia faces pressing environmental challenges such as increasing carbon emissions, urbanization-driven pollution, and declining biodiversity [2, 15]. Simultaneously, the country has seen a growing emphasis on green consumerism, supported by government-led sustainability initiatives like the Green Technology Master Plan (GTMP) 2017–2030 [34] and the Eleventh Malaysia Plan [16]. These developments have catalyzed public discourse on environmental responsibility and influenced consumer awareness regarding eco-friendly products [47]. Consequently, Malaysia presents an important and dynamic setting for examining how green innovation, creativity, and media influence consumer purchase intention, making the findings relevant both locally and regionally.

This paper begins with the introduction, which outlines the study's background, motivation, significance, and research objectives. It then moves to a review of existing literature and the development of hypotheses concerning Green Innovation, Green Creativity, and Green Media. This is followed by the theoretical and conceptual framework that guides the study. The research methodology is then described, including sampling procedures, measurement items, and data collection. Next, the findings from the data analysis are presented. The discussion highlights key insights, theoretical contributions, practical implications, and recommendations. Finally, the paper concludes by addressing its limitations and offering suggestions for future research.

2 Literature review

Green marketing has become an essential approach for businesses aiming to attract environmentally aware consumers by promoting sustainable products and practices. The heightened global emphasis on sustainability has motivated many firms to adopt green marketing strategies that align with environmental and social expectations. A growing body of research has investigated how these strategies shape consumer attitudes and behaviors, particularly focusing on their influence on Purchase Intention. This literature review synthesizes existing findings on the three fundamental aspects of green marketing such as, Green Innovation, Green Creativity, and Green Media and their roles in shaping consumers' intent to purchase sustainable products.

2.1 Green innovation

Green Innovation broadly refers to the strategic development of products, processes, and business models that reduce negative environmental impacts while delivering competitive value. This form of innovation is rooted in ecological responsibility and serves as a dual-purpose strategy: addressing pressing sustainability issues while supporting firm-level differentiation in competitive markets. It encompasses a range of activities from the

use of renewable raw materials and cleaner technologies to the redesign of products for easier recycling and the implementation of sustainable supply chain practices.

According to previous research, Green Innovation not only minimizes environmental harm but also acts as a vehicle for enhancing brand positioning and consumer appeal [8, 11]. Companies that integrate green innovations are increasingly seen as future-oriented and socially responsible, traits that resonate strongly with modern consumers who are becoming more aware of the environmental consequences of their consumption patterns. Innovations such as energy-efficient products, biodegradable packaging, and closed-loop manufacturing systems help build an eco-friendly brand image, which plays a key role in influencing consumer Purchase Intention.

Several empirical studies have confirmed that consumers respond favorably to organizations that demonstrate visible commitments to environmental improvement through innovation. Research assert that when green features are embedded in product functionality and design, they serve as powerful purchase motivators, particularly for environmentally conscious customers. Products that are recyclable, reusable, or produced using renewable energy are perceived as more credible, which significantly enhances consumer trust [14]. Research further argue that Green Innovation communicates long-term corporate responsibility, thereby enhancing the relational value between the brand and its customers [43].

Moreover, Green Innovation contributes not just to market differentiation but also to internal efficiency, as firms that adopt sustainable production often experience reduced waste and operational costs. This intersection between ecological and economic performance makes Green Innovation a vital component of sustainable business strategy and a strong predictor of consumer behavior. Ultimately, Green Innovation plays a transformative role in modern marketing by aligning corporate operations with both planetary and consumer priorities.

2.2 Green creativity

Green Creativity refers to the imaginative and original expression of sustainability principles within marketing content, advertising, and promotional strategies. It represents the intersection of environmental commitment and creative communication, aiming to reshape how consumers perceive and engage with eco-friendly products and initiatives. Green Creativity involves not just the content of the message, but also the aesthetic and emotional appeal through which sustainability is conveyed, including innovative packaging, design elements, storytelling techniques, and culturally resonant symbols of environmental consciousness.

Research highlights that consumers are more likely to respond positively to marketing campaigns that creatively emphasize the ecological advantages of a product [35]. For instance, the use of minimalistic, nature-inspired packaging and messages that evoke environmental stewardship can significantly enhance brand appeal. Research found that such creativity not only improves consumer trust but also supports a willingness to pay premium prices, particularly when the product messaging aligns with personal environmental values [19]. This suggests that Green Creativity can increase the perceived value of a product beyond its functional utility by triggering emotional and ethical resonance.

Green Creativity also operates as a strategic lever to influence value-based consumer segments. Research indicate that environmentally aware consumers are more likely to

Table 1 Measurement items for green innovation (GI)

Code	Item statement
GI1	I like products which use less or non-polluting materials
GI2	I like products which use environmentally friendly packaging
GI3	I like products, which take recycling and disposal at the end of life into account
GI4	I like new products which use recyclable materials
GI5	I like production processes which recycle materials
GI6	I like production processes which use cleaner technology to make savings
GI7	I like production which redesign its operation processes to improve environmental efficiency

Table 2 Measurement items for green creativity (GC). Source: Chen and Chang [10, 11]

Code	Item statement
GC1	I like green products which are developed using innovative and sustainable methods
GC2	I like green products which often showcase unique solutions to environmental challenges
GC3	Green products in the market often reflect creative approaches to solving environmental issues
GC4	I find that green products I use are designed with originality and usefulness in mind
GC5	I like green products which are developed with innovative eco-friendly features
GC6	I like green products which show evidence of creative thinking in their design
GC7	Green products available in the market often stand out for their creative environmental features
GC8	I feel that green products available for purchase incorporate innovative technologies to protect the environment
GC9	I like eco-friendly products which often feature new and creative solutions to minimize waste and pollution
GC10	Green products in the market are creatively designed to meet both environmental and consumer needs

support brands that communicate sustainability in unique and engaging ways [48]. Digital media has magnified the reach of such creative campaigns, especially among younger demographics such as millennials and Generation Z, who are not only more digitally engaged but also more likely to support causes that align with their social and environmental ideals [9]. Creative content such as sustainability challenges, gamified campaigns, and short-form storytelling can enhance participation, deepen engagement, and reinforce eco-friendly behavioral norms.

Furthermore, Green Creativity serves as a catalyst for awareness-building. Literature notes that creatively crafted campaigns can elevate environmental literacy by making abstract sustainability concepts more relatable and compelling. When consumers are emotionally engaged and informed, they are more inclined to integrate environmental values into their purchasing choices. Therefore, Green Creativity is not only a communication tool but a behavioral influencer that bridges the gap between brand sustainability efforts and consumer lifestyle changes (Tables 1 and 2).

2.3 Green media

Green Media refers to the strategic use of communication platforms, particularly digital and social media channels to disseminate environmental messages and promote sustainable branding. In a digitally connected world, media has become an indispensable component of green marketing, enabling companies to create awareness, influence perceptions, and engage with consumers on issues related to environmental responsibility. Green Media includes a variety of formats, such as social media posts, blog articles, sustainability reports, videos, influencer partnerships, and online advertising that highlights a firm's ecological commitments.

Research emphasize that digital media has transformed traditional marketing approaches, enabling brands to engage in two-way communication with consumers about sustainability practices [27]. Through social platforms such as Instagram, Facebook, and YouTube, organizations can share behind-the-scenes content, product lifecycle stories, and real-time updates about green initiatives, creating a transparent and interactive brand image. This level of access fosters authenticity and allows consumers to become part of a shared sustainability journey.

Influencers and digital opinion leaders further enhance the effectiveness of Green Media. Studies found that sustainability-focused influencers play a vital role in shaping consumer attitudes, especially among younger users who regard these figures as trustworthy sources of information [30, 39]. Influencer-generated content, ranging from unboxing eco-friendly products to reviewing sustainable brands, can generate organic reach and strengthen the perceived credibility of green claims. This influencer-mediated communication, when aligned with brand values, leads to increased Purchase Intention and brand loyalty.

Moreover, Green Media functions as a mechanism for building social proof. When consumers observe peers or online communities engaging with sustainable brands, they are more likely to adopt similar behaviors. Research argues that consistent exposure to green messages through media channels not only enhances consumer knowledge but also reinforces perceived brand sincerity and environmental performance [23]. Companies that frequently communicate their sustainability narratives through trusted media formats are more likely to build long-term relationships with their audience, thereby increasing consumer retention and loyalty.

In essence, Green Media acts as both an amplifier and a validator of green marketing efforts. It allows firms to scale their environmental messaging, engage diverse audiences, and co-create sustainable value with consumers through ongoing digital interaction. The credibility, consistency, and accessibility of these communications are essential for shaping modern consumer behavior in favor of eco-friendly products and brands.

2.4 Purchase intention

Purchase Intention refers to a consumer's conscious plan or willingness to acquire a product based on the perceived value it offers, particularly concerning its environmental and ethical attributes. It serves as a critical predictor of actual buying behavior and is frequently used in marketing research to gauge the effectiveness of branding and promotional efforts, especially in the context of sustainable products. As environmental awareness continues to rise globally, understanding the drivers of Purchase Intention for green products has become a focal point for businesses seeking to align with shifting consumer values.

A growing body of empirical research has demonstrated that green marketing initiatives substantially shape Purchase Intention. Strategies such as green labeling, eco-friendly packaging, sustainability certifications, and transparent corporate environmental reporting have been shown to positively influence consumer decision-making [42]. Consumers tend to interpret these visible signs of ecological responsibility as indicators of a company's authenticity and commitment to sustainability, leading to increased trust and a greater likelihood of purchase. This trend is particularly pronounced among Generation Z consumers, who place a higher premium on ethical

consumption and are highly responsive to branding cues that reflect environmental and social concerns [8]. The eco-conscious preferences of this demographic group highlight the importance of adopting marketing tactics that not only appeal to functional product attributes but also resonate with broader environmental values.

The role of Green Innovation, Green Creativity, and Green Media in fostering Purchase Intention is firmly established across various studies. Research posits that when green marketing campaigns are carefully designed to align product innovations with consumer environmental concerns, they cultivate more favorable attitudes toward the brand [25]. Positive brand attitudes are critical intermediaries that strengthen the linkage between marketing communication and Purchase Intention. Literature further assert that comprehensive green marketing efforts, those that integrate innovative product design, creative sustainability narratives, and consistent media engagement achieve greater influence on consumer behavior than fragmented or isolated initiatives [28].

Green Innovation contributes to Purchase Intention by enhancing the functional and ethical dimensions of a product. By offering tangible environmental benefits, such as lower carbon footprints, recyclable materials, or biodegradable ingredients, companies build consumer trust and differentiate themselves from less sustainable competitors. Trust, once established, acts as a crucial mechanism that reduces perceived risk and increases the likelihood of purchase.

Green Creativity, on the other hand, engages consumers emotionally and cognitively. Through storytelling, visual aesthetics, and persuasive messaging that highlights environmental values, brands can deepen consumer identification with sustainability causes. Creative approaches that successfully link ecological messages to personal identity or lifestyle choices have been shown to trigger more profound behavioral intentions toward green consumption.

Green Media plays an equally important role by amplifying these messages across digital ecosystems, ensuring that consumers are consistently exposed to sustainability narratives. Through frequent, authentic communication across social media platforms, websites, and influencer endorsements, brands can reinforce environmental messaging, strengthen recall, and nurture favorable brand associations. The consistent presence of green communications helps consumers internalize sustainability values as part of their consumption habits. Understanding how these components interact provides crucial insights for organizations aiming to craft holistic green marketing strategies that not only meet but exceed the expectations of today's environmentally conscious consumers. A well-rounded approach that integrates all three dimensions can significantly enhance consumer engagement, foster brand loyalty, and ultimately drive the transition toward more sustainable market behaviors.

2.5 Theoretical framework

This study is grounded in the Theory of Planned Behavior (TPB) developed by Ajzen [7], which posits that an individual's behavioral intention is influenced by three components: attitude toward the behavior, subjective norms, and perceived behavioral control. In the context of green marketing and sustainable consumption, TPB has been widely applied to understand how consumers' values, social influence, and perceived ability influence their intent to purchase environmentally friendly products. Green Innovation, Green Creativity, and Green Media can be conceptually mapped onto the TPB framework:

Table 3 Measurement items for green media (GM)

Code	Item statement
GM1	I find online advertisements that highlight environmental benefits of products to be trustworthy
GM2	Social media posts about eco-friendly products positively influence my purchase intention
GM3	I am more likely to share digital content that emphasizes a brand's environmental initiatives
GM4	I find digital campaigns promoting environmental sustainability credible
GM5	I often see green media campaigns on social media platforms
GM6	Green media campaigns enhance my purchase intention

Table 4 Measurement items for purchase intention (PI). Source: Shafiq and Raza [41]

Code	Item statement
PI1	I would intend to buy those products that have green packaging
PI2	I would actively seek out those green products that have higher perceived value
PI3	I plan to purchase green products in the future
PI4	From now on, I plan to purchase green products
PI5	I intend to pay more for green products
PI6	In the future, I will buy green products with less environmental pollution
PI7	I would advise others to buy and use green products

Green Innovation shapes consumer attitudes by enhancing perceived value and functionality of green products; Green Media reflects subjective norms by creating awareness and social pressure through digital influence; and Green Creativity contributes to perceived behavioral control by making sustainability more relatable and emotionally engaging. By integrating these constructs into TPB, this study provides a robust theoretical lens for analyzing how green marketing strategies affect consumer Purchase Intention in Malaysia (Tables 3 and 4).

To further align this study with its objectives and research questions, the following discussion provides a narrative audit of the literature, linking each key construct—Green Innovation, Green Creativity, Green Media, and Purchase Intention—to the research framework and the Theory of Planned Behavior (TPB).

Green Innovation is directly tied to the objective of examining its influence on consumers' Purchase Intention. This construct corresponds with the TPB component of *attitude toward the behavior*, as it reflects how consumers evaluate eco-friendly product features in terms of usefulness and environmental impact. Prior studies confirm that GI significantly shapes positive attitudes by enhancing perceptions of product functionality and ethical responsibility [9]. More recent contributions by Ahmed et al. [4] highlight how GI improves green organizational performance through environmentally responsible innovation in Asian pharmaceutical firms. Similarly, Ahmed et al. [3] emphasize the role of proactive environmental strategies, including innovation, in influencing sustainable outcomes and consumer perceptions. These studies underscore the critical importance of green innovation in shaping favorable consumer attitudes and driving behavioral intention.

Green Creativity relates to the objective of analyzing its impact on Purchase Intention and is conceptually linked to both *attitude* and *perceived behavioral control* in TPB. GC influences how consumers emotionally and cognitively engage with sustainability through imaginative design, storytelling, and branding. Chang and Chen [13] suggest that creative green messaging enhances perceived value when it aligns with personal environmental ideals. However, Ahmed et al. [3] caution that symbolic creativity must

be grounded in measurable environmental actions to be effective. Ahmed et al. [5] further argue that creativity gains strategic value only when paired with credible, proactive sustainability strategies. These findings align with this study's results, which show that GC alone may not directly influence Purchase Intention unless clearly tied to practical outcomes.

Green Media addresses the objective of evaluating how digital and media platforms influence Purchase Intention. GM maps onto the *subjective norm* component of TPB, as it shapes perceived social expectations and peer influences through communication. Empirical research shows that social and digital media channels amplify the visibility and credibility of sustainability messaging [12]. Ahmed et al. [6] found that agile green communication practices within Asian textile supply chains enhance sustainability perception and responsiveness. Similarly, Iliopoulou et al. [24] demonstrated that social media engagement directly improves consumers' intention to purchase sustainable products. These insights support the hypothesis that GM significantly contributes to green behavior through normative influence.

Finally, Purchase Intention serves as the dependent variable and behavioral outcome in this study, addressing the objective of assessing the combined effects of GI, GC, and GM. In TPB, PI represents the intention to act, shaped by the combined influence of attitudes, subjective norms, and perceived behavioral control [7]. Ahmed et al. [5] report that proactive environmental strategies significantly enhance consumer loyalty and competitiveness when integrated with strong sustainability messaging. Similarly, Yadav and Pathak [46] and Zhuang [48] affirm that intention is shaped by the perceived alignment between environmental performance and consumer expectations. These findings validate the integrated framework of this study, where green innovation and green media exhibit significant direct effects, while green creativity's influence is more context-dependent.

3 Conceptual framework and research hypotheses

Green Innovation refers to the design and implementation of environmentally sustainable products, processes, or services that reduce ecological degradation while simultaneously delivering value to customers. These innovations often involve the integration of eco-friendly technologies, renewable resources, and sustainable manufacturing practices into product development and service delivery. The adoption of green innovation allows businesses to not only reduce their environmental footprint but also to align more closely with evolving consumer preferences for sustainable consumption [10]. As sustainability becomes an increasingly central concern for consumers, green innovation emerges as a strategic differentiator that enhances brand reputation, builds long-term customer trust, and increases overall consumer satisfaction.

According to previous research, products that are developed with a focus on green innovation tend to be perceived as superior in quality and more environmentally responsible, both of which contribute positively to their market appeal [30]. The integration of green innovation into product design also signals corporate responsibility, which further reinforces consumer confidence. When consumers perceive that a company is genuinely committed to environmental sustainability, they are more likely to engage with the brand and make purchasing decisions aligned with those values. As such, green innovation is expected to significantly enhance Purchase Intention by elevating the perceived functional and ethical value of sustainable products.

H1 Green innovation has significant and positive effect on purchase intention.

Green Creativity is conceptualized as the imaginative and original integration of sustainability principles into marketing and branding efforts. It involves the development of unique, compelling, and environmentally focused messages that capture consumer attention and convey a brand's ecological commitment. This can include strategies such as the creative use of eco-labels, visually engaging green advertisements, storytelling about sustainability achievements, and campaigns that inspire environmental consciousness [21]. Green creativity leverages emotional appeal and innovation in messaging to differentiate brands and make sustainability a more relatable and engaging concept for consumers.

Prior studies emphasize that creatively communicating green values can positively influence consumer attitudes by fostering emotional attachment to a brand, thereby increasing their likelihood of making environmentally conscious purchases [26]. Furthermore, Research argues that imaginative and strategically crafted environmental messaging not only enhances brand identity but also increases consumer involvement and loyalty [37]. When creativity is used to communicate sustainability effectively, it creates a more personal connection between the consumer and the brand's environmental mission. This emotional engagement can play a critical role in shaping Purchase Intention, especially among consumers who are environmentally aware but also value authenticity and originality in branding.

H2 Green creativity has a significant and positive impact on purchase intention.

Green Media encompasses the use of digital, social, and traditional communication platforms to promote an organization's environmental initiatives and green marketing campaigns. This includes disseminating sustainability-related content through social media channels, websites, mobile apps, blogs, email newsletters, video marketing, and online advertisements. The rise of digital transformation has made these platforms vital tools for engaging with modern consumers, especially those who are digitally active and socially conscious. Social media influencers, content creators, and brand advocates have further amplified the effectiveness of green media by shaping public discourse on sustainability and influencing eco-conscious purchasing decisions [12].

Research found that consumers respond more favorably to marketing efforts that are transparent, value-driven, and accessible across multiple media platforms [11]. Sustainability-focused campaigns that are delivered through green media can increase consumer awareness, improve brand visibility, and establish a consistent environmental narrative. When consumers encounter repeated, coherent green messages across platforms, they are more likely to internalize the brand's sustainability values and translate that awareness into action. Thus, green media functions not only as a communication tool but as a strategic driver of brand equity and consumer intention (Fig. 1).

H3 Green media has a significant and positive impact on purchase intention.

4 Research methodology

4.1 Research design

This study adopts a deductive, quantitative research design, appropriate for testing theory-driven hypotheses and analyzing relationships among constructs using empirical
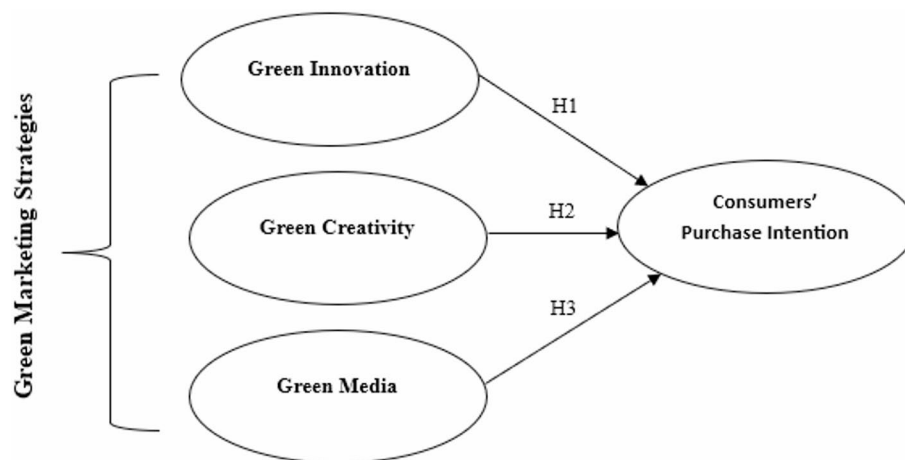
Fig. 1 Conceptual framework

data. The theoretical foundation is grounded in the Theory of Planned Behavior [7], which offers a structured model for understanding behavioral intentions through attitudes, subjective norms, and perceived behavioral control. The research design is cross-sectional in nature, employing a survey-based approach to collect data at a single point in time from a targeted group of Malaysian consumers. A quantitative method is particularly well-suited for this study, as it enables statistical testing of the relationships between Green Innovation, Green Creativity, Green Media, and Purchase Intention using a structured measurement model [20]. The goal is to identify causal paths and predictive strength among these constructs in the context of sustainable consumer behavior.

4.2 Measurement items

The operationalization of variables in this study is grounded in established, validated measurement scales drawn from previous scholarly research. These scales were carefully reviewed, selected, and adapted to fit the specific context of green marketing strategies and consumer behavior toward sustainable products. The primary objective in selecting the measurement items was to ensure strong content validity, conceptual alignment, and relevance to the study's overarching research questions.

Each construct such as, Green Innovation, Green Creativity, Green Media, and Purchase Intention, was measured using multiple indicators designed to comprehensively capture the latent dimensions of the variables. The measurement process involved adapting wording where necessary to reflect the sustainability-focused context while preserving the original meaning and psychometric integrity of the items. Careful adaptation was essential to maintain both face validity and content validity, ensuring that respondents clearly understood the items in relation to eco-friendly marketing initiatives.

The construct of Green Innovation was measured using a set of items that reflect consumers' evaluations of environmentally friendly product attributes, sustainable material usage, and the application of clean technologies in the production process. These items were adapted from Wong [45] and focus on various dimensions of green innovation, including product eco-design, process improvements, and the use of non-polluting resources. The scale emphasizes the novelty and practical implementation of green features and their perceived impact on environmental sustainability.

These items collectively assess the degree to which consumers value innovation aimed at reducing environmental impact, highlighting their preference for products that integrate sustainability into their life cycle.

Green Creativity was measured by a scale adapted from Chen and Chang [10, 11], focusing on the perceived originality, innovativeness, and appeal of a brand's sustainability communications. The scale captures how consumers perceive the creative integration of environmental values in product design, advertising, and labeling strategies. The intent is to evaluate whether green marketing messages are engaging, unique, and thoughtfully crafted to convey ecological benefits in compelling ways.

These items assess the extent to which creativity enhances consumer appreciation of green products by presenting innovative solutions and delivering sustainability messages that are visually appealing or emotionally engaging.

To assess Green Media, items were adapted from Chen and Chang [10], and Leonidou and Skarmeas [28] to capture consumer perceptions of how effectively media channels are used to communicate a brand's environmental efforts. This construct reflects the strategic deployment of online advertisements, social media posts, and digital sustainability campaigns. The scale focuses on the credibility, influence, and visibility of these green media efforts in shaping consumer attitudes.

These items explore the perceived trustworthiness, visibility, and behavioral impact of green messages shared across various digital platforms, particularly those that foster user engagement and online environmental dialogue.

The construct of Purchase Intention was measured using a scale adapted from Shafiq and Raza [41], focusing on consumers' likelihood to engage in future purchasing behavior based on their perceptions of a product's environmental value. The items assess both intention and willingness to support eco-friendly products, including consumers' readiness to recommend and pay more for such offerings.

This scale captures both behavioral intention and consumer advocacy, providing a comprehensive view of consumer alignment with green consumption values.

All measurement items are anchored on a five-point Likert scale, ranging from "Strongly Disagree" (1) to "Strongly Agree" (5). Items were carefully adapted from previously validated instruments to reflect the specific context of this study. Their use enables a reliable and conceptually grounded investigation of the effects of green innovation, creativity, and media on consumer purchase intention. The adoption of a five-point Likert scale across all items ensures consistency in response measurement, facilitating robust data analysis using Partial Least Squares Structural Equation Modeling (PLS-SEM).

4.3 Data collection

For this research, data were gathered via a structured questionnaire aimed at consumers who are knowledgeable about and actively purchase eco-friendly products. As the study seeks to understand consumer reactions to green marketing initiatives, a sample of individuals engaged in sustainable consumption was specifically targeted to examine their perceptions of Green Innovation, Green Creativity, Green Media, and their Purchase Intention.

The sampling method employed was purposive sampling, chosen for its ability to selectively target respondents who met predefined criteria namely, consumers with awareness of or interest in environmentally sustainable products and those residing in

areas with notable green marketing activity. This approach aligned with the research objectives, ensuring that only relevant participants were included.

Sample size estimation was conducted using G*Power software to determine the minimum number of participants required for robust statistical analysis. Following the recommendations for structural equation modeling (SEM), where a sample size should generally be ten times the number of indicators or paths in the model [20], a minimum of 312 respondents was deemed necessary, considering the complexity of the model involving multiple constructs and hypotheses.

The survey instrument was carefully crafted based on measurement items identified in Sect. 4.1. It consisted of clearly worded questions organized into distinct sections, beginning with demographic inquiries (e.g., age, gender, education level, and purchasing behaviors regarding sustainable products). Prior to full data collection, a pilot test was conducted with 30 respondents to ensure clarity, reliability, and contextual appropriateness of the questionnaire. In addition, expert validation was performed by two academic specialists in marketing and sustainability to confirm content validity.

A screening question was included at the start of the survey to ensure that respondents had at least minimal familiarity with green products or sustainability messaging. Responses that failed this screening or were incomplete were removed from the final dataset. Subsequent sections focused on measuring the main constructs: Green Innovation, Green Creativity, Green Media, and Purchase Intention. Responses were collected using a Likert scale to capture variations in attitudes and perceptions toward green marketing practices and sustainable purchasing behavior.

Subsequent sections focused on measuring the main constructs: Green Innovation, Green Creativity, Green Media, and Purchase Intention. Responses were collected using a Likert scale to capture variations in attitudes and perceptions toward green marketing practices and sustainable purchasing behavior.

Distribution of the survey was primarily online, utilizing social media networks, mailing lists, and forums dedicated to eco-friendly products. These channels were selected to maximize reach among individuals likely to be interested in sustainable consumption, thereby enhancing the geographical diversity of the sample.

To encourage participation and improve response rates, potential respondents were briefed about the study's purpose and assured of the anonymity and confidentiality of their responses. As an incentive, participants were offered a small reward, a discount voucher for eco-friendly products, in appreciation of their time and effort.

The study strictly adhered to ethical research practices, ensuring informed consent, confidentiality, and voluntary participation. Participants received a detailed consent form outlining the research purpose, data usage, and their right to withdraw at any stage without any repercussions. No personally identifiable information was collected, and all responses were anonymized prior to analysis to safeguard participant confidentiality. The entire process conformed to established institutional ethical standards.

Upon completion of data collection, responses were screened and cleaned to ensure integrity and accuracy. Entries with incomplete, duplicated, or inconsistent information were excluded. The validated data were then analyzed using statistical software, employing descriptive statistics, reliability tests, and structural equation modeling (SEM) to examine the proposed hypotheses and evaluate the relationships among the study variables.

4.4 Common method variance

Given the study's reliance on self-reported data from a single source, efforts were made to minimize the risk of common method variance (CMV), which could otherwise distort observed relationships among variables [38]. Both procedural and statistical approaches were incorporated to address potential CMV issues.

During the survey design and administration phases, procedural strategies were applied to mitigate bias. Respondents were reassured that their answers would remain confidential and anonymous, reducing tendencies toward socially desirable responses. Furthermore, the survey items were systematically structured to distribute questions across different constructs, minimizing the chance of respondents identifying patterns among the variables. To reinforce this, measures for independent and dependent variables were presented in separate sections [32], further lessening the risk of connected or biased responses.

Post-collection, statistical techniques were employed to detect the presence of CMV. Initially, Harman's single-factor test was conducted by performing an unrotated principal component analysis. The results indicated that the first factor accounted for less than 50% of the total variance, suggesting that CMV was not a major concern [38]. To provide additional verification, a marker variable approach was utilized, wherein a theoretically unrelated variable included in the survey was analyzed. The correlations between this marker variable and the core constructs were minimal and statistically insignificant, corroborating the absence of significant common method bias [29].

These combined procedural and statistical precautions strengthen the study's validity, ensuring that the identified relationships between variables are genuine and not artifacts of common method bias.

5 Analysis

A detailed analysis of the demographic characteristics of the study sample provides critical insights into the diversity, relevance, and representativeness of the respondents, thereby strengthening the reliability and generalizability of the research findings. A total of 312 valid and complete responses were collected, reflecting a broad spectrum of demographic backgrounds and enabling a nuanced understanding of consumer behavior toward green marketing strategies.

In terms of gender distribution, the sample comprised 54.5% female respondents and 45.5% male respondents, reflecting a relatively balanced gender representation. This balanced distribution ensures that the study captures perspectives from both genders, allowing for a more comprehensive exploration of potential gender-based differences in attitudes toward sustainability and green consumption. The presence of both male and female viewpoints also enhances the inclusivity of the findings and supports a more holistic interpretation of consumer responses to green marketing initiatives.

With respect to age composition, participants ranged from 16 years old to over 56 years. The majority of respondents fell within the 36–45 age group (27.9%), followed closely by those aged 46–55 (23.7%) and 26–35 (22.8%). Younger participants aged 16–25 accounted for 16% of the sample, while 8.7% of respondents were aged 56 and above. This age distribution suggests that middle-aged consumers, particularly those in their 30 s and 40 s, form the core demographic segment for green product adoption. Their greater financial independence, coupled with heightened environmental awareness, may

drive stronger alignment with sustainable consumption behaviors. Meanwhile, younger consumers, although a smaller proportion represent an emerging group whose green purchasing motivations are likely influenced by digital engagement, social media exposure, and broader generational shifts toward ethical consumption.

The educational attainment of respondents exhibited considerable diversity. The largest proportion held a master's degree (27.9%), indicative of a highly educated sample with substantial exposure to advanced knowledge systems, including environmental issues. Respondents with some college education comprised 24.4% of the sample, followed by those with a bachelor's degree (23.1%). Additionally, 12.2% each had either completed a high school diploma or obtained a doctoral degree. The predominance of higher education qualifications among respondents suggests a positive correlation between educational level and engagement with sustainability issues. Higher education often cultivates critical thinking skills, global awareness, and environmental sensitivity, factors which are instrumental in shaping sustainable consumption patterns.

An analysis of marital status revealed that 55.8% of participants were single, while 44.2% were married. This marital distribution implies that single individuals, who may possess greater discretionary income and enjoy greater autonomy over their consumption choices could be more inclined toward adopting green products and participating in sustainability-oriented behaviors. However, the considerable proportion of married respondents also reflects the growing integration of eco-consciousness into family purchasing decisions, signifying the broadening appeal of green marketing across different household structures.

From a geographical standpoint, the sample exhibited representation across multiple regions of Malaysia. Johor accounted for the largest share of respondents (19.87%), followed by Penang (17.31%), Kuala Lumpur (15.70%), Sabah (15.03%), and Selangor (13.46%). Smaller but notable contributions came from Sarawak (10.58%) and Putrajaya (8.05%). This geographic spread reflects an urban-centric pattern in sustainable consumption, as urban and economically dynamic regions tend to offer greater exposure to green products, higher environmental awareness, and more frequent sustainability campaigns. Nevertheless, the significant representation from Sabah and Sarawak underscores that interest in eco-friendly consumption is not confined to metropolitan areas but is also emerging in more remote or less densely populated regions. Such geographic diversity enhances the richness of the findings and underscores the nationwide relevance of green marketing efforts.

In conclusion, the demographic profile of the respondents highlights the diversity of the sample in terms of gender, age, education, marital status, and geographical location. This multidimensional diversity strengthens the study's empirical foundation, providing a solid basis for analyzing consumer responses to green marketing strategies across various demographic contexts. The inclusive nature of the sample not only enriches the analysis but also improves the generalizability of the results, enabling the formulation of more targeted, effective, and demographically sensitive green marketing strategies for different consumer segments.

5.1 Measurement model

To ensure the robustness and credibility of the measurement instruments employed in this study, a comprehensive assessment of both reliability and validity was undertaken.

Following best practices in structural equation modeling (SEM) research [20], the evaluation process was designed to confirm that the constructs were accurately and consistently measured, thereby laying a strong foundation for subsequent structural model analysis.

Reliability was examined through two internal consistency indicators: Cronbach's alpha and Composite Reliability (CR). Cronbach's alpha assesses the degree to which items within a construct are interrelated, providing an estimate of the scale's internal consistency. Composite Reliability, on the other hand, offers a more refined measure by accounting for different factor loadings among items, thus offering a superior reliability estimation in SEM contexts. The results revealed that all constructs achieved Cronbach's alpha values above the accepted minimum threshold of 0.7, indicating satisfactory internal consistency. Composite Reliability scores for all constructs ranged between 0.85 and 0.92, exceeding the recommended cutoff of 0.7, which further confirmed the reliability and robustness of the measurement scales used.

Convergent validity was assessed through three key criteria: factor loadings, Average Variance Extracted (AVE), and Composite Reliability. Individual item loadings were first examined, with all standardized factor loadings exceeding the critical value of 0.7, thereby affirming that each indicator strongly represented its corresponding latent variable [17]. In addition, the AVE values for all constructs surpassed the recommended benchmark of 0.5, indicating that, on average, the constructs captured more than half of the variance in their observed indicators. This satisfies the requirement for convergent validity and suggests that the constructs exhibit high levels of shared variance among their respective measurement items.

The reliability and validity of each construct were assessed using Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE). As presented in Table 5, all Cronbach's alpha values are above the recommended threshold of 0.70 (GC = 0.933; GI = 0.828; GM = 0.872; PI = 0.836), confirming strong internal consistency. Similarly, composite reliability values are well above 0.70 (GC = 0.943; GI = 0.869; GM = 0.901; PI = 0.880), indicating high construct reliability. In addition, all AVE values exceed the 0.50 benchmark (GC = 0.627; GI = 0.529; GM = 0.648; PI = 0.551), establishing convergent validity [20].

Discriminant validity was assessed using the Fornell–Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio approach. Based on the Fornell–Larcker criterion, the square root of each construct's AVE should be greater than its correlations with other constructs. As shown in Table 6, this condition is satisfied, as the diagonal values (GC = 0.792; GI = 0.728; GM = 0.805; PI = 0.743) are higher than the corresponding inter-construct correlations, confirming discriminant validity. To further strengthen this evidence, the HTMT ratio was examined, with all values remaining below the conservative threshold of 0.85 [22]. Since HTMT is widely considered a more rigorous and reliable method in SEM, these results provide robust support for discriminant validity.

Table 5 Construct reliability and convergent validity

Construct	Cronbach's alpha	Composite reliability (CR)	Average variance extracted (AVE)
GC	0.933	0.943	0.627
GI	0.828	0.869	0.529
GM	0.872	0.901	0.648
PI	0.836	0.880	0.551

Table 6 Fornell-Larcker criterion

Construct	GC	GI	GM	PI
GC	0.792			
GI	0.705	0.728		
GM	0.653	0.655	0.805	
PI	0.710	0.716	0.741	0.743

HTMT values, reported in Table 7, are all below the conservative threshold of 0.90, indicating discriminant validity (Henseler et al. 2015)

In Table 6, the square root of the AVE (diagonal values) is greater than the inter-construct correlations (off-diagonal values), confirming discriminant validity.

Cross-loadings were also examined, confirming that each indicator loads more strongly on its respective construct than on any other, supporting indicator reliability.

Moreover, no issues related to multicollinearity were detected, as assessed through variance inflation factors (VIFs), all of which were below the recommended threshold of 5.0. This further indicates that the constructs are distinct from one another and that no significant redundancy exists among the measurement items.

Taken together, the results from the reliability and validity assessments demonstrate that the measurement model possesses strong psychometric properties. The constructs show high internal consistency, adequately capture the underlying theoretical concepts, and are clearly differentiated from each other. Consequently, the measurement model is deemed to be both reliable and valid, thereby providing a solid and trustworthy foundation for testing the hypothesized structural relationships in the subsequent stages of analysis.

By establishing the measurement model's reliability and validity with rigor, this study ensures the credibility and integrity of the empirical findings, enhancing the contribution to the broader literature on green marketing and sustainable consumer behavior.

5.2 Structural model

To empirically test the proposed hypotheses and examine the structural relationships among the core constructs—Green Innovation, Green Creativity, Green Media, and Purchase Intention—the structural model was rigorously assessed. The analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM), a widely recognized approach in marketing and behavioral research for evaluating models with latent variables and complex interdependencies. The decision to utilize PLS-SEM was based on several methodological advantages. First, PLS-SEM is particularly effective in handling non-normal data distributions, which are common in survey-based research involving perceptual measures. Second, it allows for the simultaneous estimation of both the measurement model (outer model) and the structural model (inner model), ensuring that the reliability and validity of the constructs are confirmed before assessing causal relationships among them [20] (Tables 7 and 8).

Moreover, PLS-SEM is well-suited for predictive modeling and theory development, which aligns with the exploratory nature of this study that aims to assess the combined effects of multiple green marketing dimensions on consumer Purchase Intention. It accommodates models with moderate to large numbers of indicators, and it is also robust in studies where sample sizes may not meet the strict requirements of covariance-based SEM techniques. In this study, the structural model evaluation involved examining path coefficients, t-values, p-values, and the coefficient of determination (R^2) for the

Table 7 HTMT matrix

Construct pair	HTMT value
GI–GC	0.894
GM–GC	0.677
GM–GI	0.692
PI–GC	0.771
PI–GI	0.846
PI–GM	0.749

Table 8 Measurement model. Source: Author's own work

Construct	Indicator	Loading	Cronbach's Alpha	Composite reliability (CR)	Average variance extracted (AVE)
Green innovation	GI1	0.822	0.828	0.869	0.529
	GI2	0.657			
	GI4	0.704			
	GI5	0.566			
	GI6	0.814			
	GI7	0.769			
Green creativity	GC1	0.875	0.933	0.943	0.627
	GC2	0.842			
	GC3	0.833			
	GC4	0.712			
	GC5	0.843			
	GC6	0.709			
	GC7	0.814			
	GC8	0.876			
	GC9	0.643			
	GC10	0.730			
Green media	GM1	0.817	0.872	0.901	0.648
	GM2	0.786			
	GM3	0.849			
	GM4	0.883			
	GM6	0.675			
Purchase intention	PI1	0.761	0.836	0.880	0.551
	PI2	0.626			
	PI3	0.782			
	PI4	0.740			
	PI6	0.783			
	PI7	0.751			

dependent variable. These metrics were used to determine the strength, direction, and statistical significance of the hypothesized relationships between the independent constructs (Green Innovation, Green Creativity, and Green Media) and the dependent construct (Purchase Intention). Additionally, the predictive relevance (Q^2) and effect sizes (f^2) were evaluated to assess the model's explanatory power and practical significance. As presented in Table 9, Green Media exerts the strongest effect on PI ($f^2 = 0.253$), followed by Green Innovation ($f^2 = 0.211$). In contrast, Green Creativity shows only a small effect ($f^2 = 0.016$), indicating its comparatively weaker influence on purchase intention.

Bootstrapping was conducted with 5,000 resamples to assess the significance of path coefficients. The use of 95% confidence intervals (CI) rather than *p*-values aligns with SmartPLS standards. Table 10 presents the results.

Table 9 Effect sizes (f^2)

Path	f^2
GC → PI	0.016
GI → PI	0.211
GM → PI	0.253

Table 10 Path coefficients and bootstrapped confidence intervals

Path	Coefficient	95% CI (Lower)	95% CI (Upper)	Significance
GC → PI	0.118	− 0.011	0.265	Not Significant
GI → PI	0.433	0.253	0.575	Statistically Significant
GM → PI	0.380	0.307	0.474	Statistically Significant

The structural model results indicate that both Green Innovation and Green Media have statistically significant and positive effects on Purchase Intention. Specifically, Green Innovation (GI → PI = 0.433; 95% CI [0.253, 0.575]) and Green Media (GM → PI = 0.380; 95% CI [0.307, 0.474]) are strong predictors of consumers' intention to purchase green products.

In contrast, Green Creativity (GC → PI = 0.118; 95% CI [− 0.011, 0.265]) did not exhibit a significant direct effect on Purchase Intention. The lower bound of its bootstrapped confidence interval crossing zero confirms the lack of statistical significance. This suggests that creativity in green marketing may only impact consumer intention when it is perceived as credible and closely linked to product utility.

By employing PLS-SEM, this study ensures a comprehensive and rigorous evaluation of the theoretical framework, allowing for a deeper understanding of how various green marketing strategies interact to influence consumer behavioral intentions. The results from the structural model assessment provide critical insights into the relative importance of each construct in shaping sustainable purchasing behavior and contribute to the growing body of literature on environmentally responsible marketing practices (Fig. 2).

To examine the direct effects of the independent variables on Purchase Intention, path coefficients were analyzed. The results demonstrated that Green Innovation had a significant positive effect on Purchase Intention ($\beta = 0.433$, $p < 0.01$), thereby supporting Hypothesis 1 (H1). Conversely, Green Creativity did not have a statistically significant impact on Purchase Intention ($\beta = 0.118$, $p > 0.01$), leading to the rejection of Hypothesis 2 (H2). On the other hand, Green Media exhibited a significant positive influence on Purchase Intention ($\beta = 0.380$, $p < 0.01$), providing support for Hypothesis 3 (H3). These outcomes indicate that while both Green Innovation and Green Media are influential drivers of sustainable consumer behavior, Green Creativity in isolation may not substantially motivate purchase intentions without the presence of other moderating factors.

The model's overall explanatory power was assessed using the coefficient of determination (R^2), which measures the proportion of variance in the dependent variable accounted for by the independent variables. The R^2 value for Purchase Intention was found to be 0.698, suggesting that 69% of the variance in Purchase Intention is explained by the model. This high R^2 value signifies strong explanatory power, affirming the effectiveness of the proposed framework in capturing the key determinants influencing consumers' sustainable purchasing behavior.
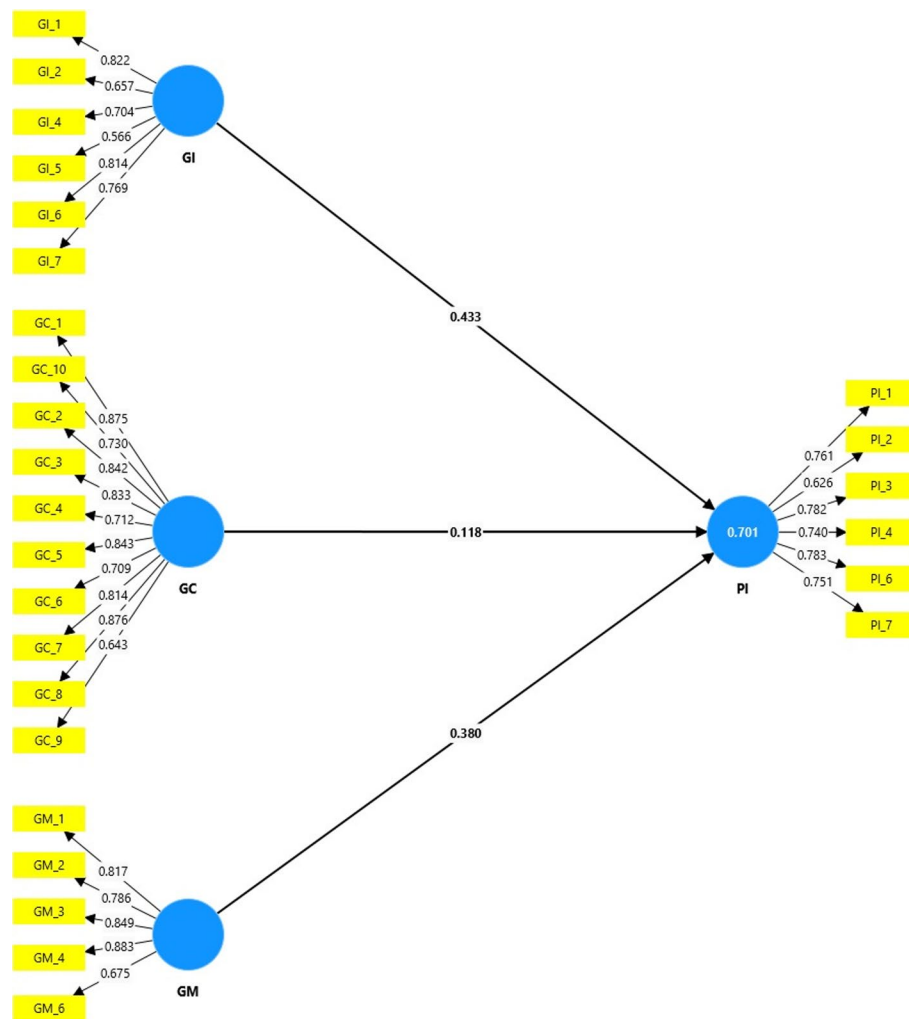
Fig. 2 Output of measurement model

6 Discussion and recommendations

6.1 Discussion of findings

The results of this study underscore the significant influence of both Green Innovation and Green Media on consumers' Purchase Intention. In contrast, Green Creativity did not demonstrate a direct or statistically meaningful effect. As such, the findings provide only partial empirical support for the proposed hypotheses. Specifically, Hypotheses 1 (H1) and 3 (H3) are supported by the data, confirming the importance of sustainable product development and strategic green communication in influencing consumer decisions. However, Hypothesis 2 (H2) was not supported, implying that while creative sustainability initiatives may add value, they do not independently drive consumer purchase behavior unless consumers clearly perceive their practical utility or relevance. This outcome is consistent with earlier findings in the literature. For instance, research noted that consumers tend to focus on concrete, functional product characteristics such as quality, pricing, and direct environmental benefits, often giving these attributes greater importance than abstract or artistic sustainability claims [18]. Likewise, studies reinforces the notion that sustainability-based creativity becomes effective only when aligned with consumer preferences and when the benefits are both clear and actionable [7, 38]. The

non-significance of Green Creativity (GC) suggests that aesthetic or symbolic sustainability messaging alone may not suffice to shape consumer behavior in emerging markets like Malaysia. This may reflect consumers' preference for practical and verifiable benefits, which aligns more closely with attitudes and perceived control than symbolic expressions.

From a TPB perspective, creativity may not strongly affect behavioral intention unless it influences attitudes via clear value perception. Additionally, green skepticism or lack of environmental literacy may moderate this link, blunting the emotional or artistic appeal of sustainability claims.

Several potential explanations may account for the limited influence of Green Creativity on Purchase Intention. One possibility is that consumers may not readily associate creative design or branding elements with actual environmental value unless such creativity is explicitly tied to product performance or sustainability outcomes. In the absence of such clarity, these efforts may be perceived as merely aesthetic or secondary. Additionally, ineffective messaging or lack of clarity in promotional content can dilute the intended message, leading to reduced consumer appreciation or awareness. There is also the issue of green skepticism, consumers may question the authenticity of creative green claims, especially if they appear vague, overly stylized, or unsupported by concrete evidence. To overcome these challenges, businesses must ensure that their creative sustainability efforts are not only innovative but also well-integrated with functional product attributes and communicated transparently.

Moreover, the absence of a significant relationship between Green Creativity and Purchase Intention may be attributed to cultural and contextual factors unique to the Malaysian market. The use of symbolic visuals, artistic design, or emotionally driven storytelling to convey green creativity may still be relatively unfamiliar or underdeveloped in this context, where consumers tend to prioritize tangible product attributes such as price, utility, and quality over abstract or aesthetic appeals. This finding aligns with studies indicating that consumers in developing economies may value practical environmental benefits over artistic or conceptual representations of sustainability [46]. Furthermore, cultural dimensions such as collectivism and uncertainty avoidance traits commonly associated with Southeast Asian societies may reduce the effectiveness of emotionally driven or unconventional marketing messages unless they are reinforced by social proof or institutional trust. In this sense, green creativity may require stronger cultural embedding or greater consumer environmental literacy before it becomes a decisive factor in shaping behavior.

6.2 Theoretical implications

From a theoretical standpoint, the insignificant impact of Green Creativity challenges the assumption often present in green marketing literature that creative messaging universally enhances consumer engagement. Within the framework of the Theory of Planned Behavior (TPB), this result suggests that creative sustainability messages may not strongly influence the attitude or perceived behavioral control components unless they are accompanied by clear, credible, and functional cues. Therefore, future theoretical models should consider integrating moderating variables such as environmental knowledge, cultural orientation, or media literacy to better understand when and how

Table 11 R^2 value

Dependent variable	R^2	Adjusted R^2
Purchase Intention	0.701	0.698

Table 12 Path-coefficient assessment. Source: Author's own work

Hypothesis	Path	Path coefficient (β)	t-value	*p*-value	Result
H1	Green Innovation → Purchase Intention	0.433	5.242	< 0.01	Supported
H2	Green Creativity → Purchase Intention	0.118	1.684	> 0.01	Not Supported
H3	Green Media → Purchase Intention	0.380	9.016	< 0.01	Supported

creativity in green marketing exerts influence. This points to the need for context-sensitive adaptations of TPB in emerging markets like Malaysia.

Taken together, these insights offer meaningful theoretical contributions by revealing how green marketing strategies impact consumer behavior in distinct ways. The study shows that Green Innovation and Green Media serve as strong predictors of Purchase Intention, while Green Creativity has a more conditional and nuanced role. The application of PLS-SEM further strengthens the methodological contribution of this research by allowing for the examination of complex structural relationships within the green marketing context. Most importantly, the findings emphasize the need for creative sustainability initiatives to be grounded in practical consumer value in order to influence purchasing decisions effectively (Tables 11 and 12).

6.3 Managerial and practical implications

From a managerial perspective, companies should focus on investing in sustainable innovations that offer clear, measurable environmental improvements and meet consumer expectations regarding quality and cost-effectiveness. Moreover, green communication strategies should be developed with an emphasis on clarity, transparency, and platform-specific engagement, ensuring that sustainability messages are both credible and accessible. Although creative marketing approaches should still be encouraged, they must be tied to real benefits and should not rely solely on novelty or artistic appeal. Instead, firms should educate consumers about the tangible environmental impacts of their creative efforts, reinforcing the authenticity and relevance of their green messaging. To enhance the impact of creative sustainability initiatives, companies should align emotionally engaging marketing with clear, functional environmental benefits. For instance, in Malaysia, Nestlé's MILO "Sayang Bumi" campaign combined eco-themed storytelling with actionable changes such as recyclable packaging and school-based environmental education, making sustainability both relatable and measurable [36]. Similarly, some Malaysian retail brands have introduced interactive elements like QR codes on packaging that allow consumers to trace product sourcing and environmental impact, effectively linking digital creativity with product transparency [1]. These approaches demonstrate how creativity, when grounded in tangible value, can reinforce credibility, deepen consumer trust, and drive purchase intention. Firms are encouraged to integrate such strategies by emphasizing both the what (creative messaging) and the why (real-world environmental contribution) of their green initiatives. Building on these findings, several practical recommendations are proposed. Organizations should align their creative sustainability efforts with product functionality and consumer value perceptions. Marketing messages should highlight the specific, real-world benefits of these initiatives,

using clear, evidence-based communication. Additionally, the adoption of third-party endorsements such as eco-labels, sustainability certifications, and verified environmental disclosures can improve credibility and increase consumer confidence in the brand's sustainability claims.

6.4 Limitations of the study and direction for future research

Future research could further explore the underlying dynamics of Green Creativity's influence by introducing mediating or moderating variables such as brand trust, perceived value, consumer environmental literacy, or institutional support. Examining these factors could reveal conditions under which creative strategies become more persuasive. Cross-cultural comparative studies would also enrich our understanding of how cultural factors shape consumer interpretations of creativity in green marketing. Likewise, sector-specific investigations could help identify how different industries respond to creative green marketing initiatives, offering more tailored insights. Longitudinal research designs would also be valuable in tracking how consumer attitudes and behaviors toward sustainable branding evolve over time, particularly as consumers become more exposed to long-term green campaigns.

Despite its contributions, this study is not without limitations. The use of a cross-sectional design restricts the ability to make causal inferences between variables, and thus longitudinal data would be useful in establishing temporal precedence. The sample, while meaningful, is geographically constrained, limiting the generalizability of the findings to broader populations or different cultural or economic settings. Furthermore, while the constructs used were validated, the abstract nature of Green Creativity as a concept warrants further qualitative exploration. In-depth interviews, case studies, or ethnographic methods may yield richer insights into how consumers perceive and respond to creative sustainability messaging.

Future research should consider introducing moderating variables such as environmental knowledge, consumer involvement, or cultural orientation to assess when Green Creativity becomes impactful. Moreover, qualitative methods such as interviews or focus groups could explore how consumers interpret creative sustainability messaging across demographics.

In summary, this study advances the understanding of how green marketing strategies affect consumer Purchase Intention by demonstrating the differing levels of influence exerted by Green Innovation, Green Creativity, and Green Media. It offers both theoretical and practical contributions, while highlighting the conditional nature of Green Creativity's impact. Addressing the limitations identified here and pursuing the suggested future research avenues will further deepen the knowledge base surrounding sustainable consumer behavior and enhance the strategic deployment of green marketing practices across industries.

7 Conclusion

This study set out to investigate the impact of Green Innovation, Green Creativity, and Green Media on consumers' Purchase Intention, applying partial least squares structural equation modeling (PLS-SEM) to examine these relationships. The results confirm that Green Innovation and Green Media significantly influence Purchase Intention, underscoring the crucial roles of sustainable product development and strategic

green communication in shaping consumer behavior. In contrast, Green Creativity did not exhibit a significant direct effect on Purchase Intention, leading to the rejection of the related hypothesis. While creative approaches introduce innovative and distinctive methods of promoting sustainability, their influence appears conditional, largely depending on how well they are linked to functional product value and effectively communicated.

These findings align with prior research. Previous study emphasized that consumers prioritize tangible product attributes such as quality, environmental impact, and price over more abstract, artistic sustainability messaging [18]. Similarly, Studies found that creative sustainability initiatives must align closely with consumer expectations and clearly demonstrate practical advantages to effectively drive purchasing behavior [7, 38]. Where Green Creativity lacks explicit functional linkage or clear communication, its ability to influence Purchase Intention diminishes.

The study provides important managerial implications. Businesses are encouraged to prioritize sustainable innovation that delivers real-world environmental and performance benefits while deploying green media strategies to build awareness and consumer trust. Creative sustainability initiatives should not be abandoned, but they must be strategically aligned with tangible product benefits and effectively communicated to consumers. Educational campaigns and transparent sustainability claims, supported by certifications and eco-labels, can further strengthen consumer acceptance and engagement.

Despite these valuable contributions, several limitations must be acknowledged. First, the cross-sectional design of the study restricts the ability to infer causality between variables. Future research could employ longitudinal designs to observe changes in consumer perceptions and behaviors over time. Second, the sample was geographically concentrated in Malaysia, which may limit the generalizability of the findings to other cultural and market contexts. Broader, cross-cultural studies would provide a richer understanding of how cultural norms influence consumer responses to green marketing strategies. Third, while validated quantitative scales were used, the abstract nature of Green Creativity suggests that qualitative approaches such as interviews or focus groups could yield deeper insights into how consumers interpret and value creative sustainability efforts.

For future research directions, scholars should investigate potential mediating and moderating variables that could strengthen the impact of Green Creativity on Purchase Intention, such as environmental concern, brand trust, product involvement, or regulatory environments. Industry-specific studies could also examine how green marketing strategies need to be tailored across different sectors, such as fashion, food, technology, and automotive industries. Moreover, experimental studies could be employed to test the effectiveness of different types of creative green messaging under controlled conditions, offering more precise guidelines for practitioners. Future studies could benefit from adopting longitudinal research designs to observe how consumer attitudes and purchase intentions toward green products evolve over time, particularly as exposure to sustainability campaigns increases. This would help establish causal relationships more robustly than cross-sectional approaches. Additionally, experimental designs could be employed to test the effectiveness of specific green marketing strategies such as the use of different message frames, media types, or levels of product innovation under

controlled conditions. Such studies can help isolate which elements of green marketing are most influential in driving consumer behavior. Furthermore, the use of qualitative methods, including in-depth interviews, focus group discussions, or even ethnographic techniques, would provide richer, contextualized insights into how consumers interpret creative sustainability messages and what psychological or cultural factors shape their responses. These approaches could complement existing quantitative findings and uncover nuanced motivations or barriers that surveys may not fully capture. Incorporating mixed-methods designs may thus offer a more holistic understanding of green consumer behavior and contribute to theory refinement and practical strategy development.

In conclusion, this study offers a comprehensive framework for understanding the differentiated roles of Green Innovation, Green Creativity, and Green Media in influencing sustainable consumer behavior. The findings contribute to the academic literature on green marketing and offer practical strategies for businesses seeking to align with the growing global emphasis on environmental responsibility. By recognizing the distinct effects of each green marketing dimension and addressing the identified limitations, future research can further advance our understanding of sustainable consumption and guide more effective green marketing practices.

Economic practices. Ultimately, this research contributes not only to the academic understanding of green marketing dynamics but also holds meaningful implications for societal transformation toward environmental sustainability. By identifying how innovation, media, and creativity can shape consumers' purchase intentions, especially within the Malaysian context, the study underscores the power of strategic marketing in fostering eco-conscious behavior. Encouraging sustainable consumption patterns at the individual level has a cumulative effect on environmental preservation, corporate responsibility, and policy development. Therefore, this research serves as a timely and relevant contribution to the global discourse on sustainability, helping both scholars and practitioners align business practices with long-term societal and environmental goals.

Author contributions
Areej Ahmed conceptualized the study, designed the methodology, conducted the analysis, and wrote the main manuscript text, Dr. Asmaul Husna Haris Fadzilah provided supervision, contributed to the refinement of the research framework, and reviewed and edited the manuscript. All authors reviewed and approved the final version of the manuscript.

Data availability
The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval
The need for ethical approval was waived off by the Research Ethics Committee of faculty of economics and business, UNIMAS (Universiti Malaysia Sarawak) because it involved anonymous questionnaire with adult participants, didn't collect any personal identifiable or sensitive data. All methods were carried out in accordance with the relevant guidelines and regulations as approved by the ethics committee mentioned above.

Informed consent
Participation in this study was entirely voluntary. All participants were provided with clear, written and/or verbal information about the purpose, procedures and benefits of the research. Participants were informed that they could withdraw from the study at any point without any consequences. Written/verbal, informed consent was obtained prior to participation. The researchers ensured that all personal data were kept confidential and used solely for academic and research purposes. No identifying information was collected or published.

Clinical trial declaration
This study does not involve any clinical trial.

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