BỘ GIÁO DỤC VÀ ĐÀO TẠO

**TRƯỜNG ĐẠI HỌC NGOẠI THƯƠNG**

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**BÁO CÁO TỔNG KẾT**

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**GIẢI THƯỞNG “SINH VIÊN NGHIÊN CỨU KHOA HỌC**

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**NĂM 2025**

**<THE IMPACT OF GREEN PACKAGING ON CONSUMER BEHAVIOUR IN E-COMMERCE>**

Thuộc nhóm ngành: Khoa học xã hội

**Tháng 3 Năm 2025**

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**ABBREVIATION**

|  |  |
| --- | --- |
| AVE | Average Variance Extracted |
| CR | Composite Reliability |
| CSR | Corporate Social Responsibility |
| E-commerce | Electronic Commerce |
| HTMT | Heterotrait-Monotrait Criteria Analysis |
| PLS-SEM | Partial Least Squares-Structural Equation Modeling |
| WOM | Word-of-mouth |

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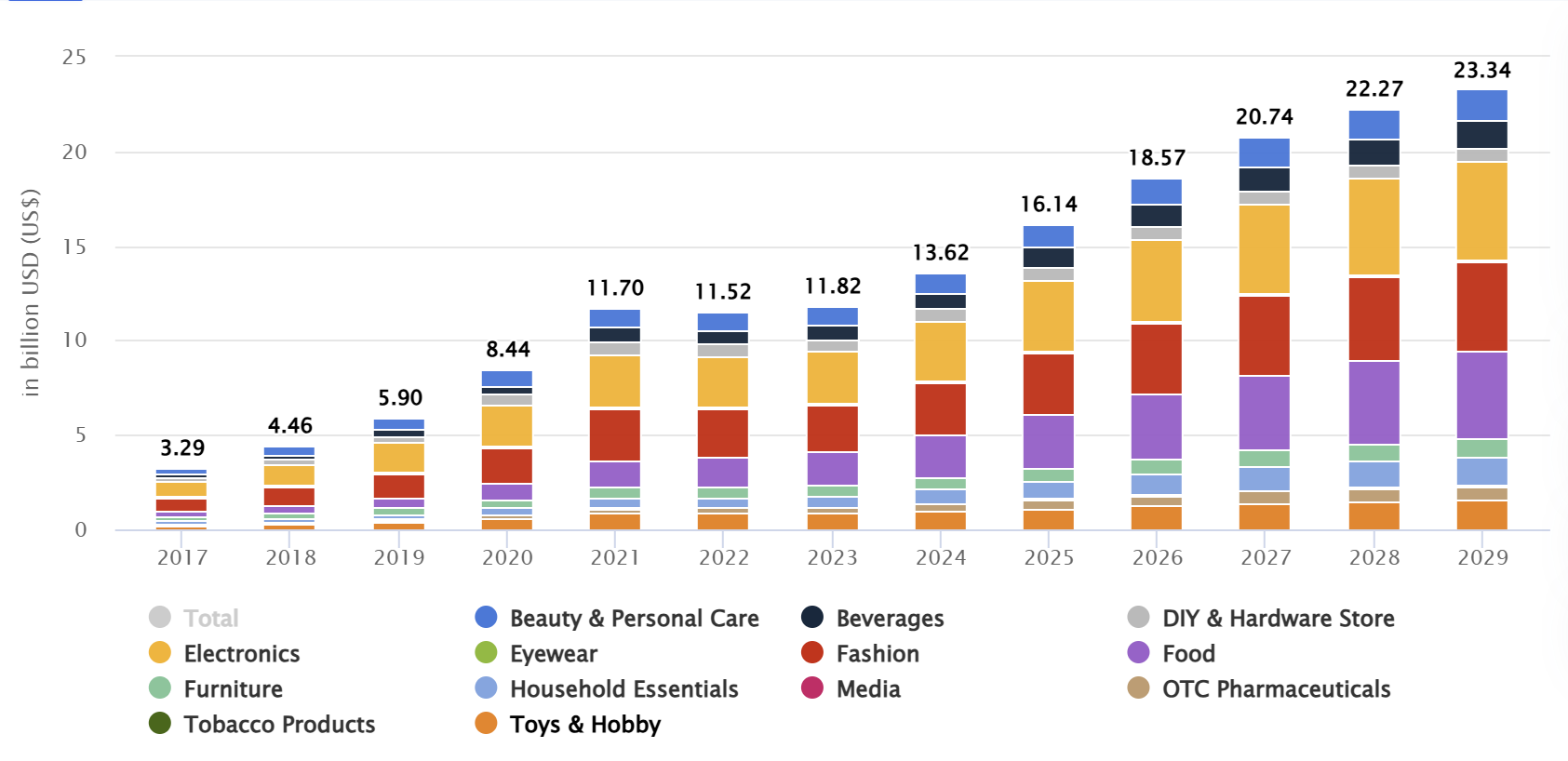
# ABSTRACT

E-commerce not only has a rising demand in Vietnam but also helps to facilitate international trade in the world. However, the huge amount of packaging waste generated from these platforms raises persistent problems. Therefore, our research aims to investigate the relationship between how green packaging, one of the proposed solutions, can impact the brand reputation and how customers would react to it. The research includes various methods to gather data, from secondary data to direct primary data from customers, and we also use multiple models to analyze and investigate the connection between variables. The results show that green packaging strategy shows a positive relationship with brand equity and WOM intention, and only environmental awareness serves as the moderation. Consequently, it suggests that companies on E-commerce platforms should replace plastic packages with ones that conform to sustainable regulations to increase their image in customers’ eyes.

***Keywords:*** Green packaging, Sustainability, E-commerce, Consumer Behaviour

# 1. Introduction

Accounting for more than a third of online platform consumers, the E-commerce industry is now worth over 6.8 trillion USD, with the prediction to reach 8 trillion USD in 2027 (Sellers Commerce, 2025). The flourishing demand for online purchases is higher in different sectors such as food, fashion, electronics, etc (Valentin Radu, 2025). The main goal of E-commerce platforms is to facilitate the purchase and sale of goods over the Internet which can operate 24/7 (clockb.tech, 2024). According to Statista (2024), the E-commerce market in Vietnam shows a CAGR of 9.69% from 2025 to 2029 with the prediction of a 23.34 billion USD worth market in 2029.



#### *Figure 1: Revenue of the E-Commerce market in Vietnam*

*(Source: Statista, 2024)*

Due to the rising trend of online shopping, the environmental problems of plastic packaging waste are problems that need to be solved (Yeonsu Kim, 2022). As of 2023, Vietnam generated more than 300 million tons of packaging waste from E-commerce platforms (Thuy Truong, 2024). A common reason for this huge amount of waste in such a small country is due to the generous order of small, separate items. These wastes are often cardboard, plastic, bubble wraps foam, etc. that are not recycled or reused (oceansix, 2023). Therefore, there is a need to have solutions for those problems that can be generated from the classic 3R approach: Reduce, Reuse, Recycle.

This research aims to investigate how packaging waste can affect consumer behaviour through green attitude, trust, satisfaction, brand equity, and word-of-mouth (WOM) intention. Green attitude introduces the consumer opinions towards the purchase of green packages online while trust exemplifies the relationship between the consumer and that brand. The satisfaction variable emphasizes whether the customers are pleased with the provided packages and how they would act in that situation. Customer satisfaction is one of the most important determinants of brand equity (Ume Salma Akbar, 2011) and they would promote that brand to other people through word-of-mouth intention.

Intensive research has been done on E-commerce platforms, however, only a few of them illustrate the relationship between packaging waste and consumer behaviour. This is because packaging waste is only a small component of the way products arrive at the destination and also due to the rising demand of electronic commerce and sustainability in recent years that are newly concerned topics.

This article contributes to E-commerce literature by addressing 2 main solutions. Firstly, it investigates how green packaging can affect customer behaviour on E-commerce platforms and to what extent, how they would react. Secondly, this article helps to show the importance of environmental concerns and the relationships of mediating roles in the model.

# 2. Literature review hypothesis development

## 2.1. Green packaging

Packages refer to the purpose of protecting and ensuring the safety of the products while also providing the marketing function of that brand. Selecting the right package design and size can gain loyalty from customers who will later choose your brand for its quality and experience (Inke, 2025). Choosing the wrong size for packages can either damage the goods or contribute to future wasteful brand image. An inappropriate design will lead to the reduction of the attractiveness of the product, service, and image of brand perception, eventually creating adverse effects on the level of customer appeal and desirability. E-commerce platforms, and online websites for shopping, experience a significant increasing pressure for the purpose of adopting sustainable practice. (ACCA, 2020). The main issue of online shopping lies in the process of logistics, targeting to reduce the overall carbon footprints. According to TapChiMoiTruong (2023), E-commerce platforms face major problems in lowering the rate of plastic packaging waste, which costs centuries to break down and creates toxic chemicals for animals and plants. Another problem is the packages are often not recycled or reused. Companies use different types of methods to reduce the plastic in packages, these include using biodegradable/recyclable materials, reverse logistics for recycling, using appropriate sizes for products, etc. SPA (2002) has listed the four main requirements that sustainable packaging should meet: (1) it should bring both social and economic benefits, (2) it should use energy, and materials as efficiently as possible, (3) it should be recyclable through the specialized system and (4) it should create non-toxic chemicals for the environment.

In the case of Amazon, which is considered one of the biggest E-commerce platforms in the world, has also implemented green packaging strategies to comply with its net zero carbon emission by 2030. The first project run was called Ships in Product Packaging which delivers products without Amazon’s packaging, only cover label and supplier’s packaging that qualify for this program. By doing this, Amazon reduced the amount of generated waste and took up less space in the truck, increasing the truck fill rate. In 2024, over 4 million products are certified to be delivered under this program using machine learning and product testing to qualify the products. The second strategy, in the case of additional Amazon packaging, requires sellers to use paper or cardboard boxes to replace plastic air pillows, these packaging can be collected back for recycling at every house. Furthermore, Amazon also invests in machines and technology to help reduce plastic bags and replace the traditional cardboard box with bags or envelopes.

According to Entrepreneur Magazine, packaging cost accounts for 10-40% of products’ retail price, which is relatively high for products reaching the customer. Therefore, a company shall apply an effective packaging price strategy in order to achieve the lowest cost possible. However, when it comes to sustainable packaging, the price can be much higher, being a constraint for online customers to purchase our products. In a survey of Raconteur, the surveyors revealed that 43% of brands believe cost is the primary factor that challenges the process of switching to sustainable packaging. In fact, green packaging materials can increase costs by 50% compared to regular materials (The Telegraph, 2010). Technology and manufacturing is determined as the primary rationale of this lies. In more detail, the requirement of new research and new machine innovation is crucial due to the sustainable process being still new and the relative lack of available appropriate frameworks for practices (Swiftpak, 2022). Besides, while conventional plastics create mass production at a low cost, the recent development only allows processing a small volume of packaging at a time. Additionally, certifications are one of the factors that contribute to the packaging cost, which shows the company’s commitment to genuinely eco-friendly products. As E-commerce services are in rising demand, the management and implications of sustainable aspects create complexity for controlling systems.

According to Carter & Ellram (1998), it is proved that sustainable packaging contains a broader purpose than just attracting customers. Besides the main function of reducing carbon emissions and plastic waste, it also helps to protect the product inside and serve marketing purposes. In a report by Polonsky et al. (1998), the authors believe that sustainable packaging is evidence of the green attitude of customers. This statement has then been proved through the first hypothesis that green packaging positively affects customers’ attitudes (Jayasinghe, 2022). Based on the mentioned literature review, our research proposes the first hypothesis.

*H1: Using Green packaging has a significant positive effect on green attitude.*

## 2.2. Green attitude

Green attitude refers to an individual’s positive perception and inclination toward environmentally friendly products, practices, and behaviours (Leonidou et al., 2010). In the context of sustainable consumer behaviour, green attitude is a crucial psychological construct influencing purchasing decisions, especially in e-commerce, where consumers have more flexible choices regarding sustainable products (Joshi & Rahman, 2015). According to the Theory of Planned Behavior (Ajzen, 1991), attitude plays a key role in shaping consumer behaviour, including the adoption of green products and eco-friendly packaging.

Previous studies have shown that a strong green attitude is positively correlated with environmentally friendly purchasing behaviour. For example, Gleim et al. (2013) emphasized that consumers who value sustainability tend to support brands that use green packaging. Additionally, Wang et al. (2019) found that a high level of environmental concern strengthens the relationship between green attitude and sustainable consumer behaviour. In e-commerce, green attitude influences purchasing decisions by increasing consumer preference for eco-friendly packaging solutions that align with their sustainability values (Hussain et al., 2020).

However, some studies suggest that a strong green attitude does not always translate into green purchasing behaviour due to barriers such as price sensitivity, limited options, and skepticism about corporate greenwashing (Nguyen et al., 2021). Therefore, to better understand green attitudes in e-commerce, it is essential to consider external moderating factors such as environmental awareness and concern about social opinion, which may either reinforce or weaken its impact on sustainable consumer behaviour.

*H2: Green attitude has a significant positive effect on satisfaction.*

*H7: Green attitude has a significant positive effect on satisfaction.*

## 2.3. Satisfaction

Satisfaction in consumer behaviour refers to a consumer’s overall evaluation of a product or service based on how well it meets expectations and perceived value (Oliver, 1999). In the context of green packaging, consumer satisfaction depends on factors such as functionality, aesthetics, and environmental impact (Rettie & Brewer, 2000). Sustainable packaging is increasingly seen as an essential aspect of corporate responsibility, influencing brand perception and customer loyalty (Magnier & Schoormans, 2015).

Research suggests that green packaging can enhance consumer satisfaction by meeting ethical and functional expectations. For example, Magnier et al. (2016) found that brands using eco-friendly packaging are perceived as more trustworthy, leading to higher satisfaction levels. Similarly, Prakash and Pathak (2017) argued that sustainable packaging reinforces consumers’ environmental identity and reduces cognitive dissonance, contributing to post-purchase satisfaction. However, consumer satisfaction with green packaging is not solely based on its environmental benefits but also on usability and aesthetics. If eco-friendly packaging is perceived as inconvenient or ineffective, it may lead to dissatisfaction despite its sustainability advantages (Rokka & Uusitalo, 2008; Steenis et al., 2017). In e-commerce, packaging plays an even more crucial role as it influences both product protection and brand experience (Scott & Vigar-Ellis, 2014).

Satisfaction has a direct impact on consumer trust in a brand. When customers are satisfied with green packaging, they tend to appreciate the company’s commitment to environmental responsibility, which enhances their trust in the brand (Magnier et al., 2016). This is particularly important as trust is a key factor in repeat purchases and long-term brand engagement.

Moreover, satisfaction positively influences brand equity. Green packaging not only helps brands demonstrate social responsibility but also contributes to creating a strong brand image in consumers’ minds. When consumers are satisfied with both the functionality and environmental benefits of the packaging, they are more likely to perceive the brand as valuable, leading to stronger brand equity (Prakash & Pathak, 2017). Therefore, to maximize brand value, businesses must balance sustainability with consumer experience in packaging design.

*H3: Satisfaction has a significant positive effect on trust.*

*H5: Satisfaction has a significant positive effect on brand equity.*

## 2.4. Trust

Trust is a crucial factor in shaping consumer behaviour, particularly in e-commerce transactions where physical product inspection is absent. Trust in brands offering green packaging is influenced by perceptions of environmental commitment and transparency ([Nguyen et al., 2019](https://www.mdpi.com/2071-1050/11/9/2653#:~:text=Underpinned%20by%20the%20cognition%E2%80%93affect%E2%80%93behavior%20%28C-A-B%29%20paradigm%2C%20this%20study,the%20relationship%20between%20greenwash%20and%20green%20purchase%20intentions.)). Consumers are more likely to develop trust when brands provide verifiable claims about sustainability, such as certifications or detailed environmental impact reports ([Chaudhuri & Holbrook, 2001](https://professorbassell.com/wp-content/uploads/2020/06/Branding_-The-Chain-of-Effects-from-Brand-Trust-and-Brand-Affect-to-Brand-Performance-The-Role-of-Brand-Loyalty_Chaudhuri-Holbrook.pdf)). Trust in sustainable products fosters long-term consumer relationships, as ethical and eco-friendly practices enhance credibility ([Moorman et al., 1993](https://people.duke.edu/~moorman/Publications/JM1993.pdf)). In the context of e-commerce, trust is particularly significant due to the perceived risk of greenwashing, where brands exaggerate their environmental benefits ([Leonidou et al., 2013](https://www.researchgate.net/publication/257527098_'Greening'_the_Marketing_Mix_-_Does_it_Payoff)). Thus, companies must ensure consistency between their green packaging claims and actual sustainability performance to maintain consumer trust.

According to Keller (1993), consumer trust strengthens brand recognition and enhances brand loyalty, thereby increasing brand equity. Trust also serves as an essential mediating factor between satisfaction and brand equity (Delgado-Ballester & Munuera-Alemán, 2005). When customers trust a brand, they are more likely to perceive it as credible, high-quality, and socially responsible, contributing to stronger brand equity.

Additionally, trust has a significant impact on WOM (word-of-mouth) intention. Research by Ganesan (1994) and Sirdeshmukh et al. (2002) suggests that trust increases customers’ confidence in recommending a brand to others. When consumers believe that a brand is genuinely committed to sustainability and transparent in its claims, they are more motivated to share their positive experiences with their social circles (Eisingerich & Bell, 2008). This is particularly important in the e-commerce landscape, where WOM serves as a vital tool in reducing perceived risks associated with green products (Chen & Chang, 2013).

*H4: Trust has a significant positive effect on brand equity.*

*H6: Trust has a significant positive effect on WOM intention.*

## 2.5. WOM intention

Word-of-mouth (WOM) intention is a key driver of consumer engagement, as it reflects the likelihood of consumers recommending a brand or product to others. Green packaging can significantly influence WOM intention by enhancing consumer satisfaction and trust ([Yadav & Pathak, 2017](https://fardapaper.ir/mohavaha/uploads/2018/12/Fardapaper-Determinants-of-Consumers-Green-Purchase-Behavior-in-a-Developing-Nation-Applying-and-Extending-the-Theory-of-Planned-Behavior.pdf)). When consumers perceive a brand’s sustainability efforts as genuine and impactful, they are more likely to share positive experiences with peers, both online and offline ([Grewal et al., 2019](https://www.researchgate.net/publication/312301607_The_Future_of_Retailing)). Furthermore, environmentally conscious consumers actively promote brands that align with their values, amplifying the reach of sustainable marketing strategies ([Islam et al., 2021](https://www.researchgate.net/publication/343491985_The_Impact_of_Corporate_Social_Responsibility_on_Customer_Loyalty_The_Mediating_Role_of_Corporate_Reputation_Customer_Satisfaction_and_Trust)). WOM intention is particularly powerful in e-commerce, where online reviews and social media discussions shape purchasing decisions, making sustainability-driven recommendations a valuable asset for brands.

## 2.6. Brand equity

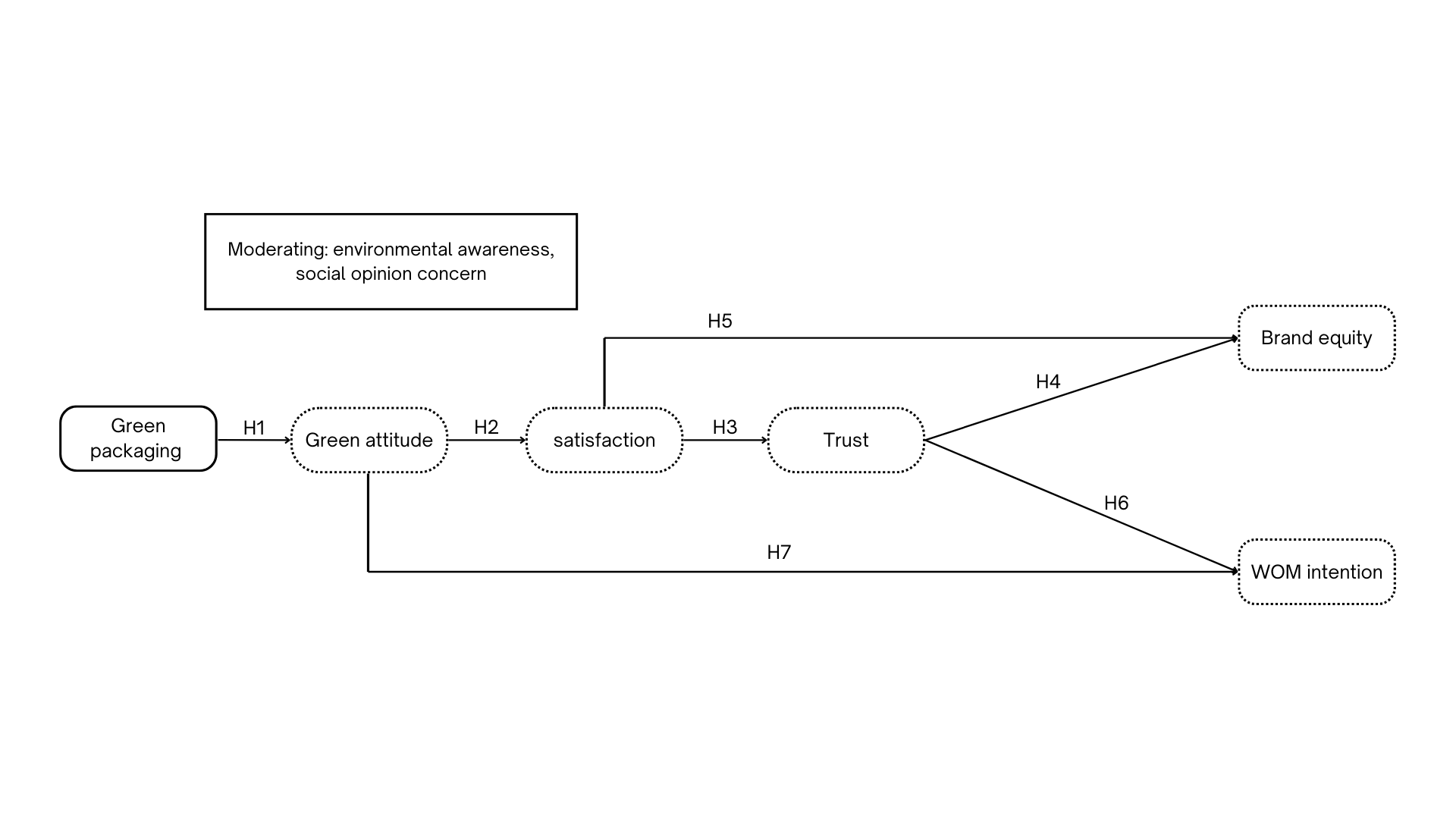
Brand equity refers to the value consumers associate with a brand, which includes perceived quality, brand associations, and loyalty ([Keller, 1993](https://people.duke.edu/~moorman/Marketing-Strategy-Seminar-2015/Session%203/Keller.pdf)). Green packaging enhances brand equity by positioning a company as environmentally responsible, leading to stronger consumer attachment and preference ([Chen, 2010](https://www.academia.edu/42690162/The_Drivers_of_Green_Brand_Equity_Green_Brand_Image_Green_Satisfaction_and_Green)). Studies suggest that brands that integrate sustainable practices into their packaging strategy can differentiate themselves in competitive e-commerce markets, ultimately increasing perceived brand value ([Wu & Chen, 2014](https://pdfs.semanticscholar.org/f9c5/b3ce6bdff2559650766a6aebd77c09547b68.pdf)). Moreover, strong brand equity translates into increased consumer willingness to pay a premium for eco-friendly products ([Hartmann & Apaolaza-Ibáñez, 2012](https://isiarticles.com/bundles/Article/pre/pdf/1983.pdf)). As environmental awareness grows, brand equity becomes increasingly linked to sustainable initiatives, reinforcing the importance of adopting green packaging strategies.

***Moderating role: Environmental awareness***

*H8: The positive relationship between attitude, satisfaction, and trust will be stronger when environmental awareness is high.*

*H9: The positive relationship between attitude, satisfaction, and trust will be stronger when social opinion’s concern is high.*

## 2.7. Conceptual framework and research hypotheses



#### *Figure 2: Conceptual framework*

H1: Using Green packaging has a significant positive effect on green attitude.

H2: Green attitude has a significant positive effect on satisfaction.

H3: Satisfaction has a significant positive effect on trust.

H4: Trust has a significant positive effect on brand equity.

H5: Satisfaction has a significant positive effect on brand equity.

H6: Trust has a significant positive effect on WOM intention.

H7: Green attitude has a significant positive effect on WOM intention.

# 3. Methodology

## 3.1. Research method

The present research utilizes the quantitative analysis method. This method focuses on solving data in the form of numbers and uses mathematical operations to audit their properties. An important factor to be taken into account when selecting suitable statistical tests is the number of cases about which you have data. The levels of measurement of the variables, the number of samples, and whether they are related or independent are all factors that determine which tests are appropriate (Walliman, 2011).

## 3.2. Data collection

To achieve its objectives, this paper gathers primary data from respondents in the selected area. The research sample consisted of individuals who answered an online survey spread across social networks. The data were collected in January 2025, and almost all respondents were students aged 18 to 24 years old (62.3%). The second group is people from 25 to 34 years old (20.9%). After screening, the questionnaire's 191 responses were able to be used in further research.

In the questionnaire, we apply the scale of 5 points Likert includes:

1: Strongly Disagree;

2: Disagree;

3: Neutral;

4: Agree;

5: Strongly Agree

## 3.3. Questionnaire

|  |  |
| --- | --- |
| **Environmental awareness of customers** | |
| Environmental Awareness  (Hassan, Noordin, & Sulaiman, 2010) | I am concerned about environmental problems at my place. |
| I always discuss environmental problems with my friends. |
| I am aware of my responsibility towards the environment. |
| I deliver information on the environment to my family members. |
| **Social opinion concern of customers** | |
| Social Opinion Concern  (Mohd Suki & Mohd Suki, 2015) | I have read newsletters, magazines, and other publications written by environmental groups. |
| I have signed a petition in support of protecting the environment. |
| **Green attitude when shopping online** | |
| Green Attitude  (Kashif & Rani, 2021) & (Simanjuntak et al., 2023) | I prefer to buy products that use biodegradable material in packaging. |
| I wish to buy those products that are picked up and recycled for other uses. |
| I buy biodegradable products even if they belong to a less well-known company. |
| Purchasing green products is a smart choice. |
| Switching to green products brings many beneﬁts. |
| **Online sellers use green packaging.** | |
| Green Packaging  (Jayasinghe, 2022) & (Kawa & Pierański, 2021) | Green packaging provides all the necessary information about the product. |
| Customers buy from online sellers who use environmentally friendly materials for packing their parcels. |
| Customers buy from online sellers who match the size of the packaging to the size of the product. |
| Customers buy from online sellers who offer returnable packaging. |
| Customers buy from online sellers who offer a return of used products. |
| **Level of satisfaction with products using green packaging** | |
| Satisfaction  (Supriadi, Astuti, & Firdiansyah, 2017) & (Lakatos et al., 2021) | I intend to continuously buy products using green packaging. |
| I have never complained about green packaging products when shopping on e-commerce platforms. |
| I feel that I contribute to environmental protection and sustainable development when buying products using green packaging. |
| The choice of this product due to its environmental commitment makes me happy. |
| Overall, I am satisfied with this product because it is environmentally friendly. |
| **Level of trust with products using green packaging** | |
| Trust  (Costa, 2020) & (Borah, Kofi, & Marwa, 2024) | I trust products with sound commitments to environmental protection. |
| I feel that this product’s environmental functions are generally reliable. |
| This product’s environmental concern meets my expectations. |
| This product keeps promises and commitments for environmental protection. |
| **Brand equity on e-commerce platforms** | |
| Brand Equity  (Chen, 2010) & (Vinh & Huy, 2016) | Buying this brand instead of others is reasonable because of its environmental commitments, even if the prices are the same. |
| Assuming both brands focus on environmental issues, purchasing products from the brand that uses green packaging would be a better choice. |
| Products with green packaging have more significance than regular ones. |
| **WOM intention about products using green packaging** | |
| WOM Intention  (Cachero-Martínez, 2020) | I will recommend everyone to buy this product. |
| I will recommend the advantages of this product to people I know. |
| I will recommend this product to people who seek my advice. |

### *Table 1: Questionnaire*

## 3.4. Statistical tools

Before analyzing the reliability and the validity of the measurement scales, partial least squares–structural equation modeling (PLS-SEM) is applied in this study to test the proposed structural model. In particular is the statistical software SMART PLS 4. Cronbach’s alpha and Composite Reliability (CR) used as reliability measures. Construct reliability established through convergent and discriminant validity. Finally, the model (SEM) was tested for goodness on SMART PLS 4. Among techniques of statistical modeling SEM is recognized as the youngest for the purpose of regression analysis (Bashir, 2019).

# 4. Result

## 4.1. Descriptive results analysis

Regarding customers' environmental awareness, 86.4% of respondents agreed or strongly agreed that they are concerned about environmental problems in their area. Meanwhile, 65.4% frequently discuss environmental issues with friends. The sense of responsibility toward the environment was recognized by 83.8% of respondents, and 54.5% stated that they actively deliver environmental information to their family members.

Social opinion concern for environmental issues showed that 67.5% of respondents have read newsletters, magazines, and publications written by environmental groups, while 39.8% have signed a petition in support of environmental protection.

In terms of green attitude when shopping online, 78.5% of respondents expressed a preference for products that use biodegradable materials in packaging. Additionally, 78% prefer products that are packed up and recycled for further uses. The choice to buy biodegradable products even from lesser-known brands was supported by 61.2% of respondents. Purchasing green products was seen as a smart choice by 78.5%, and 90.6% of respondents acknowledged the benefits of switching to green products.

The perception of online sellers using green packaging revealed that 83.2% of respondents believed that green packaging provides all necessary information about the product. 58.1% stated that customers buy from sellers who use environmental packaging materials, and 63.9% agreed that sellers match packaging sizes appropriately. Moreover, 70.2% of respondents affirmed that sellers offering returnable packaging are more favorable.

Satisfaction levels with products using green packaging were high, with 77% of respondents intending to continuously purchase green-packaged products. Complaints about green packaging were minimal, as 63.9% disagreed with the statement about dissatisfaction. Additionally, 81.7% believed that contributing to environmental protection and sustainability made them feel happy, and 78.5% were satisfied with their purchase decisions.

Regarding trust in products with green packaging, 78% of respondents trusted that such products contain all necessary information. Furthermore, 72.8% felt that the environmental functions of these products were genuinely sustainable, while 85.3% agreed that they effectively communicate environmental concerns. The commitment of these products to environmental protection was recognized by 80.6%.

For brand equity on e-commerce platforms, 78% of respondents believed that buying from a brand using green packaging is a better choice, and 76.4% agreed that such products have higher significance than non-green alternatives. Additionally, 67.5% considered it reasonable to support brands with environmental commitments, even if prices remained the same.

Lastly, WOM (word-of-mouth) intention for products using green packaging showed strong advocacy, with 80.6% of respondents willing to recommend these products to others. Furthermore, 74.3% would recommend green-packaged products to people they know, and 64.4% would promote the advantages of these products to those seeking their advice.

These findings highlight a strong consumer preference for green-packaged products, reinforcing the importance of sustainable practices in e-commerce.

## 4.2. Construct validity and reliability

According to Chin (1998); and Hulland (1999), the Outer Loading rate > 0.7 is considered to be considerable to calculate the relationship between variables. As shown in Table 2, the Outer Loading rate in our research has an average of over 0.7 so it should be used in further analysis.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | EB-G | EWOM-H | GA-C | GP-D | STI-E | TR-F |
| C1 |  |  | 0.768 |  |  |  |
| C2 |  |  | 0.759 |  |  |  |
| C3 |  |  | 0.741 |  |  |  |
| C4 |  |  | 0.783 |  |  |  |
| C5 |  |  | 0.780 |  |  |  |
| D1 |  |  |  | 0.785 |  |  |
| D2 |  |  |  | 0.773 |  |  |
| D3 |  |  |  | 0.840 |  |  |
| D4 |  |  |  | 0.828 |  |  |
| D5 |  |  |  | 0.755 |  |  |
| E1 |  |  |  |  | 0.772 |  |
| E2 |  |  |  |  | 0.790 |  |
| E3 |  |  |  |  | 0.802 |  |
| E4 |  |  |  |  | 0.846 |  |
| E5 |  |  |  |  | 0.801 |  |
| F1 |  |  |  |  |  | 0.834 |
| F2 |  |  |  |  |  | 0.839 |
| F3 |  |  |  |  |  | 0.785 |
| F4 |  |  |  |  |  | 0.853 |
| G1 | 0.861 |  |  |  |  |  |
| G2 | 0.856 |  |  |  |  |  |
| G3 | 0.859 |  |  |  |  |  |
| H1 |  | 0.888 |  |  |  |  |
| H2 |  | 0.878 |  |  |  |  |
| H3 |  | 0.764 |  |  |  |  |

### *Table 2: Findings of Outer Loading Analysis*

Average Variance Extracted (AVE) is considered to be reliable when the value exceeds 0.5 (Hock & Ringle, 2010). This figure represents that the latent construct explains more than 50% of the variance in its indicators. If AVE is less than 0.5, it suggests that the variance due to measurement error is greater than the variance produced by the construct. In the following Table 3, he minimum AVE of variances is 0.587 which satisfies the aforementioned conditions. Therefore, the construct variances explain at least 58.7% of the indicator's construction.

Regarding the paper of Hair et al. (2016), Composite Reliability (CR) should be greater than 0.7 explaining the strong relation and reliable measurement in the intended construct. Besides, the consistency of a construct can also be calculated through Cronbach’s Alpha value> 0.7 (Nunnally & Bernstein, 1994). From our analysis, the CR values vary from the minimum of 0.877 and the maximum of 0.900 while Cronbach’s Alpha ranges from 0.800 to 0.862. This proves that both CR and Cronbach’s Alpha values satisfy the mentioned conditions, thus confirming the relationships between the constructs are reliable and strong.

|  |  |  |  |
| --- | --- | --- | --- |
| Constructs | Cronbach's alpha | Composite reliability (CR) | Average variance extracted (AVE) |
| EB-G | 0.823 | 0.894 | 0.737 |
| EWOM-H | 0.800 | 0.882 | 0.715 |
| GA-C | 0.825 | 0.877 | 0.587 |
| GP-D | 0.858 | 0.897 | 0.635 |
| STI-E | 0.862 | 0.900 | 0.644 |
| TR-F | 0.847 | 0.897 | 0.686 |

### *Table 3: Findings of Internal Consistency Reliability*

Furthermore, discriminant validity issues can be measured through Heterotrait-Monotrait Criteria Analysis (HTMT) theory. Henseler et al.(2015), and Gold et al. (2001) certified that an HMTM value under 0.9 signifies that the constructs being measured are sufficiently distinct from one another. Based on Table 4, this figure runs from 0.470 to 0.882, which conforms with the requirements by being less than 0.9. This proves that the constructs in our research are not overlapping or redundant.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Constructs | EB-G | EWOM-H | GA-C | GP-D | STI-E | TR-F |
| EB-G |  |  |  |  |  |  |
| EWOM-H | 0.485 |  |  |  |  |  |
| GA-C | 0.470 | 0.732 |  |  |  |  |
| GP-D | 0.507 | 0.776 | 0.666 |  |  |  |
| STI-E | 0.596 | 0.732 | 0.817 | 0.745 |  |  |
| TR-F | 0.627 | 0.784 | 0.749 | 0.814 | 0.881 |  |

### *Table 4: Findings of Heterotrait-Monotrait Criteria Analysis*

## 4.3. Hypothesis testing and model fit

To test the hypotheses in the structural model, our study employed SPSS for statistical analysis, ensuring that the sample size met the necessary criteria for hypothesis testing. The results demonstrate strong support for all proposed hypotheses, with varying levels of significance.

The relationship between green packaging (GP-D) and green attitude (GA-C) is positive and significant (β = 0.599, t = 8.834, p < 0.001), supporting H1. This indicates that consumers’ perceptions of green packaging positively affect their attitudes toward environmentally friendly products.

Furthermore, green attitude (GA-C) strongly predicts satisfaction (STI-E), supporting H2 (O = 0.697, t = 12.653, p < 0.001). This result emphasizes the crucial role of consumers' positive attitudes toward green practices in enhancing their overall satisfaction with the products.

The relationship between satisfaction (STI-E) and trust (TR-F) is positive and significant (β = 0.756, t = 15.696, p < 0.001). Hence, H3 is supported, further reinforcing the role of satisfaction in shaping consumer perceptions. This supports the hypothesis that when consumers are satisfied with a product, they are more likely to trust the brand.

The results also validate H4 of the impact of trust (TR-F) on brand equity (EB-G) (O = 0.339, t = 4.459, p < 0.001), indicating that trust plays a significant role in building a strong brand value. This demonstrates that consumer trust is a critical factor in fostering brand loyalty and enhancing brand equity.

Additionally, the effect of satisfaction (STI-E) on brand equity (EB-G) (O = 0.250, t = 2.829, p < 0.01) confirms that consumer satisfaction is an essential driver of brand equity, supporting H5. This highlights the importance of customer satisfaction in strengthening the overall value and reputation of the brand.

Trust (TR-F) significantly influences WOM intention (EWOM-H) (O = 0.449, t = 4.677, p < 0.001). Hence, H6 is supported, highlighting the importance of consumer confidence in driving word-of-mouth behaviour. This confirms that when consumers trust a brand, they are more likely to recommend it to others, thus contributing to positive WOM.

Finally, the relationship between green attitude (GA-C) and WOM intention (EWOM-H) is positive and significant (β = 0.324, t = 3.451, p < 0.01). Hence, H7 is supported. This shows that consumers who hold positive green attitudes are more inclined to engage in WOM behaviours related to eco-friendly products.

Overall, the findings confirm that satisfaction and trust are key mediating factors in shaping brand equity and WOM intentions, emphasizing the significance of green attitudes and environmentally responsible business strategies in fostering strong consumer relationships.

|  |  |  |  |
| --- | --- | --- | --- |
| **Hypothesis** | **Original sample (O)** | **T statistics** | **Hypothesis Supported** |
| **H1: Green Packaging → Green Attitude** | 0.599 | 8.834\*\*\* | Yes |
| **H2: Green Attitude → Satisfaction** | 0.697 | 12.653\*\*\* | Yes |
| **H3: Satisfaction → Trust** | 0.756 | 15.696\*\*\* | Yes |
| **H4: Trust → Brand Equity** | 0.339 | 4.459\*\* | Yes |
| **H5: Satisfaction → Brand Equity** | 0.250 | 2.829\*\* | Yes |
| **H6: Trust→ WOM Intention** | 0.449 | 4.677\*\*\* | Yes |
| **H7: Green Attitude → WOM Intention** | 0.324 | 3.451\*\* | Yes |

### *Table 5: Structural Model Results*

\*\*\*p < 0.001 (highly significant)

\*\*p < 0.01 (moderately significant)

\*p < 0.05 (significant)

## 4.4. Moderating effects of environmental awareness

Environmental Awareness has been proven to have a positive moderating impact on green product purchasing decisions (Rama, 2024) using the Likert scale. According to our research result, awareness moderates the positive relationship between Trust and Brand Equity with an Original Sample >0 and p-value < 0.05. This result relatively means if the customers have a high green awareness, they will choose the brand that provides sustainable values. Besides, a positive moderating effect of awareness also exists in the connection between satisfaction and brand image. Customers are aware of the benefits of purchasing green-packaged products, which results in increasing satisfaction and improves the perception of that brand. Otherwise, Environmental Awareness does not affect other variables.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Hypothesis | Original Sample (O) | Sample Mean (M) | Standard Deviation (STDEV) | T statistics (|O/STDEV|) | P-value | Moderation |
| GA-C → EWOM-H | 0.038 | 0.035 | 0.083 | 0.462 | 0.644 | NO |
| GA-C → STI-E | -0.030 | -0.019 | 0.050 | 0.588 | 0.557 | NO |
| GP-D → GA-C | -0.030 | -0.022 | 0.058 | 0.511 | 0.609 | NO |
| STI-E → EB-G | -0.210 | -0.213 | 0.104 | 2.022 | 0.044 | YES |
| STI-E → TR-F | 0.003 | 0.019 | 0.049 | 0.066 | 0.947 | NO |
| TR-F → EB-G | 0.250 | 0.251 | 0.114 | 2.187 | 0.029 | YES |
| TR-F → EWOM-H | 0.022 | 0.016 | 0.085 | 0.256 | 0.798 | NO |

### *Table 6: Results of the moderation variable: Environmental Awareness*

# 5. Discussion

Packaging is only a small part of a complete product to be delivered to the customer, however, it contributes up to 46% of total plastic waste (Solinatra, 2024). Studies about waste packaging management do not only include theoretical models but also examine the relationship it has with consumer behaviour. As of the technological integration and rapid development of Industry 4.0 in Vietnam, E-commerce is attracting a large user base along with nearly $31.6 million worth of goods sold in a day (Thong, 2024). Therefore, there is a need to reduce the packaging waste generated from e-commerce activities.

Capturing the ongoing issues, this study aims to exemplify the relationship between green packaging, green attitude, customer satisfaction, trust, brand equity, and Word-of-mouth intention. The empirical analysis carried out highlights the positive and relatively strong relationships between variables. Therefore, a better green packaging strategy, a more positive consumer attitude, more satisfaction and trust of the customer, the stronger the brand equity and word-of-mouth intention. With a strong brand image, a great impression will be retained as customers successfully purchase the orders, increasing brand loyalty and sales. WOM recommendations also have the same result as they lower the purchase barriers due to the lack of knowledge.

Among the main relationships in the model, age, environmental awareness, and social concern also have positive moderating effects. Firstly, age has strengthened the connection between satisfaction and trust as the older the customers, the they are more satisfied and trust compared to the younger group. Secondly, environmental awareness is a strong moderation for the relationship between trust and brand equity. This relatively means that once the brand has set up sustainable packages, it can gain better attention from people who are more aware of environmental issues. Finally, the satisfaction and trust of customers are also moderately affected by social opinion concerns. Therefore, businesses need to be aware of social concerns and actively manage their reputation. A negative social opinion can ruin customers' satisfaction and trust.

## 5.1. Managerial implications

This paper not only examines the relationship between sustainable packaging with brand equity and WOM intentions but also raises various practical implications. Firstly, in the age of technology, E-commerce receives a huge user base to purchase products every day, and this action generates a large amount of packaging waste. This poses a precious opportunity for companies to achieve trust and satisfaction from customers through a sustainable packaging strategy. Green packaging has a positive impact on the attitude of customers and shows a weak relationship with WOM recommendations, which has been proved through our analysis. Meaning that the customers are more aware of the urgent and severe environmental issues. Following that improvement, higher customer satisfaction will strongly increase their trust but have little impact on brand reputation. Trust is the final dependent variable that has both positive connections with brand image and WOM intentions. Therefore, the whole model shows that the process of implementing complete green packaging for your products will result in better company development.

Secondly, customer satisfaction should be a primary strategy for a company at first sight as it is one of the highest chosen variables in our survey. Even though the packaging is only a small part of a product delivered to the customers, it shows how meticulously a company visualizes its product. With further investment in the packaging, customers will realize that they are treasured and the company has followed corporate social responsibility (CSR). Besides, customer satisfaction is the main objective of large corporations such as Amazon, Samsung, Dell, etc., and has been proven to have a positive result.

The final highlight of this research is the trust of customers since they need to be aware of the certifications and figures on how purchasing these sustainable covers can have a real impact on the environment. For example, a product using green packages is committed to using 50% of the profits to grow trees on a hill, this will not achieve customer trust until it shows evidence of that greener hill. Therefore, the company can only gain trust once it implements the commitment and follows the regulations of green packaging.

## 5.2. Limitations of the research

Despite the value gained, our research recognizes limitations inherent. The first limitation is in connection with the data collection processing. Data was gathered mainly in Ho Chi Minh City and from two age groups including 18 to 24 years old and 25 to 34 years old. Based on these reasons, our study fails to consider the diversified shopping culture among different countries. This may lead to less certainty findings in comparison with a cross-cultural study. Therefore, the sample lacks the capacity to represent the buying behaviour of the population. Besides that, consumer behaviour of consumers is an unstable variable, it could fluctuate in the future due to the change of numerous factors. Finally, the limitation of time has certainly created constraints during the process of conducting the research. It causes a decline in the research conducted compared to our original aspirations.

# 6. Conclusion

This study analyzes the effect of green packaging on consumer buying behaviour whenever using online platforms to purchase has been successfully concluded. And whether attitudes, satisfaction, and trust create a bridge to mediate the relationship between green packaging with brand equity and the WOM intention of the consumer. These factors are observed to have an influence on both brand equity and WOM intention at differential levels. In summary, all hypotheses are accepted.

In the scope of this study, we contribute to the existing body of knowledge relevant to consumer behaviour and sustainable economic practice. The results of our research give evidence to demonstrate the thesis that applied green packaging for E-commerce practice could affect consumer behaviour thereby contributing substantially to the revenue of these businesses. However, in future studies, we recommend expanding the scope of the study to increase the diversity and quality of the sample.

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