

Trust-Based Acceptance of AI-Enabled Eco-Friendly Product Recommendations

The Roles of Explainability, Eco-Personalization Fit, and Environmental-Claim Credibility

**Trust-Based Acceptance of AI-Enabled Eco-Friendly Product Recommendations:
The Roles of Explainability, Eco-Personalization Fit, and Environmental-Claim
Credibility**

A Project Report

Submitted to:

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Major : Business Analytics

Department: BBA

Registration Trimester: Fall 2026, (261)



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Date of submission: JULY 19, 2026

Letter of Transmittal

Date: 19 July,2026

To

Mr. Ahmed Imran Kabir

Assistant Professor,

School of Business & Economics (SoBE),

United International University

Subject: Submission of project report

Respected Sir,

My project report titled "Trust-Based Acceptance of AI-enabled Eco-Friendly Product Recommendations: The Role of Explainability, Eco-Personalization Fit and Environmental-Claim Credibility" This report has been developed in connection with the academic requirement of BBA program.

In addition, I would like to thank you for your guidance and support while completing this project. I hope the report will academically stick to the level you expect.

Sincerely,

Ashin Kumar Hridoy

ID: 111191106

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Declaration of the Student

This is to certify that this project report has been done by me for academic purposes which is done based on my own research, survey, analysis, and interpretation. This report has not been submitted anywhere for any degree, diploma, or any academic award. Abstract All sources and references in this report have been appropriately cited using the relevant style of referencing for academic work.

Student ID: 111191106

Signature: _____

Date: 19 July, 2026

Acknowledgement

First, I would like to express my sincere gratitude to Almighty Allah for giving me the strength, patience, and ability to complete this research project. I also want to express my deep gratitude to my supervisor for the continuous guidance, constructive criticism, and academic support in preparing this report. The tips I got throughout the research enabled me to enhance the conceptual model, refine the methodology and make clearer insights regarding the results.

Many thanks also to the respondents who took part in the survey and shared with me their views about AI-enabled green product recommendation. Their answers enabled the empirical analysis. Finally, I acknowledge the support of my family, classmates, and well-wishers who encouraged me throughout this academic journey.

Abstract

This study investigates how AI-enabled eco-friendly product recommendation features are associated with consumers' purchase intention in sustainable e-commerce. The research focuses on three antecedents: perceived recommendation explainability, perceived eco-personalization fit, and perceived environmental-claim credibility. Trust in AI-enabled eco-product recommendations is examined as a mediating construct, while purchase intention toward AI-recommended eco-friendly products is treated as the outcome variable. The study is grounded in the Stimulus-Organism-Response framework, supported by Signaling Theory. A structured offline survey was used to collect data from 153 respondents. Python was used for data screening, demographic profiling, descriptive statistics, correlation analysis, and common method bias assessment. Measurement model evaluation, structural model assessment, bootstrapping, and testing of mediation were benchmarked on Smart PLS.

The result reveals that eco-personalization fit indeed significantly affects trust and purchase intention, respectively. There is a strong relation between environmental-claim credibility and trust and between trust and purchase intention. Chinese-based recommendation explainability does not significantly relate to trust or purchase intention in the final sample. Environmental-claim credibility also does not show a significant direct relationship with purchase intention, but it has a strong indirect relationship through trust. The results suggest that consumers respond more strongly to recommendation relevance and credible sustainability information than to explanation alone. The study contributes to understanding trust formation in AI-enabled sustainable product recommendation systems and provides practical implications for e-commerce platforms seeking to promote eco-friendly products.

Keywords: AI recommendation system, eco-friendly products, trust, purchase intention, environmental-claim credibility, eco-personalization fit, sustainable e-commerce

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List of Acronyms & Abbreviations

Acronyms and abbreviations used in this report.

Acronym	Meaning
AI	Artificial Intelligence
AVE	Average Variance Extracted
CR	Composite Reliability
ECC	Perceived Environmental-Claim Credibility
EPI	Purchase Intention toward AI-Recommended Eco-Friendly Products
EPF	Perceived Eco-Personalization Fit
HTMT	Heterotrait-Monotrait Ratio
IPMA	Importance-Performance Map Analysis
PLS-SEM	Partial Least Squares Structural Equation Modeling
PRE	Perceived Recommendation Explainability
TRA	Trust in AI-Enabled Eco-Product Recommendations
VIF	Variance Inflation Factor

CHAPTER I: INTRODUCTION

1.1 Background of Study

Artificial intelligence has become increasingly visible in online shopping environments through product recommendation systems (Adawiyah, Purwandari, Eitiveni, & Purwaningsih, 2024). These systems suggest products to consumers based on browsing patterns, previous choices, product attributes, ratings, and other signals. However, (Satinet, Ducarroz, & Fouss, 2025) AI-enabled recommendations can make a distinct difference in sustainable e-commerce, as consumers often need support to find climate friendly products, compare environmental information, and evaluate whether climate-friendly claims are trustworthy. But while the system may be technically capable, (Rohden & Espartel, 2024) the process of recommendation affects how consumers feel about the recommendation .

Eco-friendly product recommendations involve an additional layer of evaluation compared with ordinary online recommendations. According to (Xu & Chen, 2025), Consumers may ask whether the recommended product fits their personal needs, whether the platform has understood their environmental interests, whether the sustainability claims appear credible, and whether the platform can be trusted (Hassan, Abdelraouf, & El-Shihy, 2025; Isac et al., 2025). This study focuses on these consumer perceptions rather than on the technical algorithm itself. The central concern is whether selected features of an AI-enabled recommendation system can build trust and encourage purchase intention toward eco-friendly products (Ahmed, Ashrafi, Paraman, Dhar, & Annamalah, 2024).

This study identifies the three main antecedents: recommendation explainability, eco-personalization fit, environmental-claim credibility. Explainability is whether the consumers understand why a product was recommended to them (Guttmann & Ge, 2024). Eco-personalization fit is defined as the match of a consumer with respect to preferences, needs, and sustainability involvement for the product that they are recommended to select as a green alternative (Hassan et al., 2025). Environment claim credibility concerns the true appearance of the environmental information and whether the information is realistic and credible signs such as certification, eco-label (Isac et al.,

2025). Next, the research explores trust as an intermediary and purchase intention as the ultimate outcome (An & Ngo, 2025; Fu, Hu, Zhang, & Li, 2025).

The growth of online shopping altered the way consumers search for products, as well as comparable products and evaluate them. Where consumers are used to direct inspection and advice from salespeople as well as information faces of products very often in traditional shops. In digital shopping environments, however, recommendation systems increasingly guide consumer attention (Rohden & Espartel, 2024) by selecting and displaying products that appear relevant to the user.(Yin, Qiu, & Wang, 2025a) point out that This makes recommendation systems an important part of the online purchase journey because the recommended product may become the first option that consumers seriously evaluate(Ding, Antonucci, & Venditti, 2025; Zaman, Mohamed Jasim, Hasan, Akter, & Vrontis, 2025).

AI-enabled recommendation systems can be useful because they reduce information overload (Zaman et al., 2025). Consumers are often exposed to many product alternatives, price levels, reviews, and promotional messages. A recommendation system simplifies this environment by presenting a smaller set of options (Akdim, Mekouar, & Iraqi, 2025). However, (Liu & Wang, 2025) argue that simplification also creates a trust issue. So consumers will accept a recommendation if they believe the system is trustworthy, relevant and transparent, yet reject it if it appears random, biased or a commercial manipulation(Guttmann & Ge, 2024).

Online recommendation decisions become even more complicated with the advent of eco-friendly products. It is more straightforward for a consumer to judge price, design, or brand reputation, whereas it becomes more complicated to verify a product's environmental quality. A product can be marketed as sustainable; green; biodegradable; recyclable; eco-friendly but people today do not know what these claims mean. The uncertainty makes sustainability credibility most critical for e-commerce. The problem becomes more important when recommendation systems are used for eco-friendly products. As (Koch & Denner, 2025) In ordinary product categories, consumers may focus on price, quality, brand, and convenience. In eco-friendly product categories, they also need to evaluate whether the sustainability claim is credible. If the environmental

information appears vague or exaggerated, consumers may hesitate even when the product is recommended by a platform (Isac et al., 2025).

The other problem is that explainability itself may not be enough (Guttmann & Ge, 2024). A platform might have an explanation for why this product came to be recommended, but consumers may be likely to wonder if the recommendation is a good fit for their personal circumstances or if the eco-friendly claim is convincing. This implies that explainability needs to be examined alongside personalization and green credentials value. Relying solely on explainability as the primary treatment of trust may give an incomplete perspective on sustainable recommendation acceptance (Xu & Chen, 2025).

This research thus fulfills both a gap in practice and in theoretical literature. In practical terms, it is upon e-commerce platforms to learn what key aspects of AI-enabled eco-friendly recommendations should be prioritized (Satinet et al., 2025). Main problem This study theoretically examines whether trust serves as a mediating mechanism between cues related to the recommendation and purchase intention addressing a recognized gap in the process (Rahman, 2025). By concurrently examining PRE, EPF, ECC, TRA, and EPI, the study provides a comprehensive structure of trust-based acceptance within sustainable recommendation contexts (Akdim et al., 2025; Guttmann & Ge, 2024).

The crux of the issue can be explained as following: it may be recommending an eco-friendly product but whether a consumer is willing to buy that product is contingent on her or his interpretation of the recommendation. Trust is likely to develop if the recommendation is personally relevant (Hassan et al., 2025) and the environmental claim credible (Isac et al., 2025)⁴-. For instance, if a recommendation is explained but meaningless or implausible, the explanation does no more than launch purchase intention.

In this context, the present study considers AI-enabled eco-friendly product recommendations as a combination of technological and sustainability-related cues (Ki & Kim, 2022). The recommendation is not evaluated only as a technical output. It is also evaluated as a message that communicates relevance, credibility, and possible environmental value. Therefore, the study examines how consumers respond to

recommendation explainability, eco-personalization fit, and environmental-claim credibility through trust and purchase intention(Guttman & Ge, 2024).

The research is relevant because consumers are increasingly expected to make more environmentally responsible purchase decisions, yet the online market often contains mixed and uncertain sustainability information (Isac et al., 2025). Now when a platform suggests an eco-friendly product, the consumer must still determine if the recommendation is useful, and if the product claim is believable. Insights into these psychological responses can explain why certain environmental recommendations work and others don't (Satinet et al., 2025).

This study also contributes to the discourse on responsible digital marketing. Typically, AI recommendation systems are set to get as many clicks or engagement or sales as possible. Sustainable commerce platforms, on the other hand must ask whether the recommendation itself will serve the dual purpose of an informed and reliable consumer decision (Satinet et al., 2025). However, a technically accurate but not credible recommendation may not increase purchase intention. On the flip side, even if a recommendation is well explained, it might fail to convince consumers if it does not match their needs(Guttman & Ge, 2024).

As a result, the background of this study lies at the crossroads of AI recommendation, sustainable product communication, and consumer trust. The model is designed to capture not only the informational features of the recommendation but also the psychological process through which consumers translate those features into purchase intention. This makes the study suitable for understanding consumer behavior in emerging AI-supported sustainable commerce settings.

1.2 Statement of the Problem

Many e-commerce platforms now use recommendation systems, but consumers may not automatically trust these recommendations, especially when the recommendation concerns eco-friendly or sustainable products (Koch & Denner, 2025). Sustainable product claims are often difficult for ordinary consumers to verify. Consumers may not accept the recommendation if environmental information seems ambiguous, exaggerated

or unsupported (Isac et al., 2025; Zaman et al., 2025). Similarly, even a well explained recommendation will not generate purchase intention if the product does not suit consumer preferences or if the sustainability claims do not appear credible.(Adawiyah et al., 2024; Akdim et al., 2025).

Previous discussions of AI recommendation systems often focus on algorithmic accuracy, personalization, or transparency (Guttmann & Ge, 2024). However, in the context of sustainable product recommendations, environmental information and trust become especially important (Satinet et al., 2025). There is a need to understand whether explainability, personalization fit, and environmental-claim credibility are related to trust and purchase intention in the same way. This study addresses this issue by testing a trust-based model of AI-enabled eco-friendly product recommendations.

1.3 Objectives of the Study

The broad objective of this study is to examine the relationships between AI-enabled eco-friendly product recommendation features, consumer trust, and purchase intention. The specific objectives are as follows:

- To investigate the positive relationship between perceived recommendation explainability and trust when AI-enabled eco-product recommendations are provided.
- To examine a positive relationship between perceived eco-personalization fits with trust and purchase intention.
- To study the relationship between perceived environmental-claim credibility with trust & purchase intention.
- To examine the effect of trust on purchase intention toward AI-based recommendations for sustainable products.
- To test whether trust mediates the relationship between recommendation features and purchase intention.

The scope is intentionally focused on perception-based acceptance rather than actual transaction behavior. This is appropriate because the study investigates how consumers evaluate AI-enabled eco-friendly recommendations at the decision-intention stage. Purchase intention is used as the outcome because it reflects the consumer's stated willingness to consider or buy the recommended eco-friendly product.

The research does not examine the technical performance of a particular AI algorithm. Instead, it examines consumer perceptions of recommendation features. This distinction is important because consumers usually do not observe the internal algorithmic process. They respond to visible cues such as explanation, relevance, credibility, and the degree of trust formed during the evaluation process.

The study is also limited to self-reported survey data. As a result, the findings should be interpreted as evidence of perceived relationships among constructs rather than proof of causal effects. Nevertheless, the model provides useful insight into how young online consumers evaluate AI-supported sustainable product recommendations.

Research Questions

- Does perceived recommendation explainability have a relationship with trust and purchase intention?
- Does perceived eco-personalization fit have a relationship with trust and purchase intention?
- Does perceived environmental-claim credibility have a relationship with trust and purchase intention?
- Does trust mediate the relationship between recommendation features and purchase intention?

1.4 Scope and Limitations of the Study

The study examines consumers' perception of AI-enabled sustainability recommendations in an online shopping context. The five core constructs are related to perceived recommendation explainability, perceived eco-personalization fit, perceived environmental-claim credibility, trust, and purchase intention. It is restricted to perception-based survey responses and not actual purchase records or experimental behavior.

Findings are assumed to be within the limitations of survey-based research. The sample was primarily male and from an age range that limits greater generalization. On the other hand, while the cross-sectional design does not permit firm causal conclusions, it is also possible that self-reported Likert-scale responses once more incorporate response bias. Hair and Alamer (2022). Potential straight-lining cases were also identified during screening and are acknowledged as a limitation of the dataset. Therefore, the findings should not be generalized to all consumer groups without caution, particularly female consumers, older consumers, and consumers with distinct levels of online shopping experience.

1.5 Definition of Key Terms

Table 1 : Construct Definitions

Code	Construct	Definition
PRE	Perceived Recommendation Explainability	The extent to which consumers understand why a product was recommended and what factors influenced the recommendation(Guttmann & Ge, 2024).
EPF	Perceived Eco-Personalization Fit	The extent to which the recommended eco-friendly product matches the consumer's personal needs, product preferences, and sustainability interests(Hassan et al., 2025; Xu & Chen, 2025).
ECC	Perceived Environmental-Claim Credibility	The extent to which consumers perceive environmental information and sustainability claims as accurate, truthful, genuine, and supported by credible signs(Isac et al., 2025; Koch & Denner, 2025).
TRA	Trust in AI-Enabled Eco-Product Recommendations	The consumer's confidence that the platform provides reliable, knowledgeable, and dependable recommendations for sustainable products(Hassan et al., 2025; Xu & Chen, 2025).

Code	Construct	Definition
EPI	Purchase Intention toward AI-Recommended Eco-Friendly Products	The consumer's stated willingness to buy an eco-friendly product recommended by the platform(Isac et al., 2025; Satinet et al., 2025).

1.6 Organization of the Remaining Chapter

The report is organized into five chapters. Chapter I presents the introduction, problem statement, objectives, scope, and key terms. Chapter II discusses the relevant theoretical foundation, literature-based concepts, conceptual framework, and hypotheses. Chapter III describes the research design, sample, questionnaire development, data collection, and data analysis plan. Chapter IV presents the empirical findings and analysis based on Python and SmartPLS outputs. Chapter V discusses the findings, conclusion, practical recommendations, limitations, and scope for future research.

CHAPTER II: REVIEW OF LITERATURE

2.1 Theoretical Foundation

The theoretical foundation is used to connect the variables of the study with clear research logic. Since the study focuses on consumer perceptions of AI-enabled eco-friendly product recommendations, the model needs to explain both the information that consumers receive and the psychological process through which they respond. For this reason, the study uses the Stimulus-Organism-Response framework as the main theory and Signaling Theory as the supporting theory (Ki & Kim, 2022; Yin et al., 2025a).

It particularly justifies the rationale of treating perceived recommendation explainability, perceived Eco personalization fit, and perceived environmental-claim credibility as antecedent variables, trust at the middle of the model, and purchase intention as the dependent variable.

Stimulus-Organism-Response Theory

(Yin et al., 2025a) state that the S-O-R framework is suitable for this study because online shopping decisions are often shaped by environmental cues. In a digital platform, consumers do not only evaluate the product itself. They also evaluate how the product is presented, what information is available, and whether the platform appears trustworthy. These cues can influence the consumer's internal evaluation before a purchase intention is formed.

In the present study, the stimuli are the visible recommendation and sustainability cues: recommendation explainability, eco-personalization fit, and environmental-claim credibility. Trust represents the stage of organism because it reflects the internal evaluation of the recommendation system. Purchase intention represents the response stage because it shows the consumer's willingness to buy the recommended eco-friendly product(Yin et al., 2025a).

This structure helps explain why the study does not examine the variables only as direct predictors of purchase intention. Some recommendation cues may first influence trust and then become related to purchase intention. Therefore, (Yin et al., 2025a) demonstrate

that the S-O-R framework provides a suitable structure for testing both direct and indirect relationships.

The Stimulus-Organism-Response paradigm forms the theoretical basis of this study. The framework is appropriate as the research we consider investigates how external cues within a recommendation environment, which is supported by AI, are linked to an internal psychological appraisal and subsequently to an intention to behave. In this study, the stimulus stage consists of the explanatory ability of recommendation, eco-personalization fit, and environmental-claim credibility. These variables are used to capture the information related to recommendation and sustainability that the consumer receives during eco-friendly product recommendations. The organism stage is represented by trust towards AI-enabled eco-product recommendations since it reflects the internal psychological assessment of the recommendation system. The response stage has been illustrated as the purchase intention towards eco-friendly products recommended through AI. And as a result, the S-O-R offers a theoretical ground for how purchase intention mediated by trust relates to recommendation and sustainability cues.(Yin et al., 2025a).

Signaling Theory

The Signaling Theory is of particular importance when considering sustainable e-commerce where consumers are often confronted with information uncertainty. As (Ki & Kim, 2022) explain A consumer might see a product labelled as eco-friendly, but might not be able to verify the actual environmental quality of the product. In this case, the consumer judges the credibility and usefulness of the recommendation based on the signals it receives.

In this study, recommendation explainability works as a transparency signal. It tells the consumer why the product was recommended. Eco-personalization fit works as a relevance signal. It shows whether the recommendation matches the consumer's needs and sustainability interests. Environmental-claim credibility works as an authenticity signal. It helps the consumer judge whether the sustainability information appears truthful and believable(Guttman & Ge, 2024).

These signals do not automatically create purchase intention. They need to be interpreted by consumers. Trust is therefore important because it reflects whether the consumer

accepts the signals as reliable. When the signals are weak, unclear, or doubtful, trust may not develop strongly (Ki & Kim, 2022). When the signals are relevant and credible, trust may become stronger (Hassan et al., 2025).

Signaling Theory is used as a supporting theoretical perspective because consumers may not always be able to verify the actual environmental quality of AI-recommended products. In online shopping, consumers often depend on available information signals to judge whether a recommendation is reliable, relevant, and credible (Koch & Denner, 2025). In this model, recommendation explainability works as an explanation signal, eco-personalization fit works as a personal relevance signal, and environmental-claim credibility works as a sustainability credibility signal. These signals help consumers evaluate whether the AI-enabled recommendation can be trusted. This theoretical lens is highly applicable to sustainable e-commerce in which environmental claims cannot be easily interpreted by consumers unless these claims can be verified through visual cues, such as an eco-label, certification or credible sustainability information (Isac et al., 2025; Ki & Kim, 2022).

Role of Trust in the Proposed Model

Since AI-enabled recommendation systems act as information intermediaries in this study, trust matters. Consumers do not have visibility of how products are chosen and ranked by the system. They rely on the platform to deliver recommendations that are helpful, trustworthy, and far from deceptive (Xu & Chen, 2025). (Hassan et al., 2025) point out that even when a product gives the impression of being sustainable, if consumers do not trust the recommendation process, they may have an aversion to it.

In the case of green products, it is important that trust is also associated with environmental uncertainty. Consumers can be far more supportive of sustainability than they are sceptically against, but when product claims begin to stretch believability or when the path and behavior appear will also bridge into the blurry, that natural scepticism overtakes rational persuasion. Trust helps reduce this uncertainty by making the recommendation and the sustainability message more acceptable (Isac et al., 2025).

The proposed model therefore treats trust as a mediating variable. This means that the study does not assume that every recommendation feature directly produces purchase

intention. Rather, some features might be relevant simply because they contribute to a consumer feeling confident in the recommendation system. According to (Sarstedt & Moisesescu, 2024) this is especially important for the credibility of environmental-claims, which may operate primarily by trust(Isac et al., 2025).

Trust occupies a main mediating point in this model. Consumers might not embrace AI-propose environment-friendly goods when they are not confident that the suggestion is reliable or the environmental claim is credible (Hassan et al., 2025). We conclude that consumers rate a recommendation system favorably when the recommendation pertains to them and sustainability information is plausible. Here, we identified the route for recommendation performance and sustainability cues to shape purchase intention through trust (Sarstedt & Moisesescu, 2024). We see both findings as more congruent with the organism stage of the S-O-R framework and the tenets of Signaling Theory that credible and relevant signals reduce uncertainty. For this purpose, trust is not only considered as an additional outcome variable, but rather as the mechanism that links AI-enhanced recommendation signals to purchase intention toward green products.

This theoretical positioning also explains why the study does not rely heavily on general technology adoption theories. The focus of the research is not only whether consumers adopt an AI system, but how they evaluate recommendation-related and sustainability-related cues when forming trust and purchase intention. Thus, the S-O-R framework, supported by Signaling Theory and a trust-based explanation, provides the most appropriate theoretical foundation for this report.

2.2 Literature Survey

Sustainable E-Commerce and Eco-Friendly Product Choice

Sustainable e-commerce refers to online buying and selling activities where environmental concerns are considered in product information, product selection, and consumer decision-making. In this context, consumers may compare ordinary products with eco-friendly alternatives and decide whether the sustainable option is worth considering. This part of the process can be aided by the online environment by putting

product information, sustainability information, reviews, labels and recommendations together in one place(Satinet et al., 2025).

Selecting eco-friendly products is not always an easy task. (Isac et al., 2025) highlight that Consumers might profess to concern for the environment, but environmental attributes seldom affect product evaluation when price and quality are the obvious preferable attributes, alongside convenience, familiarity with the brand, and perceived usefulness of the product. So a pro-eco suggestion will find acceptance only if the recommended product is not only environmentally significant but also practically) feasible for the consumer.(Satinet et al., 2025).

Having sustainable options can help, and indeed, online platforms can serve a crucial role in making these visible. Even if you have eco-friendly products, if they are jumbled with all the other products that have the largest carbon footprint, you probably will not be seen. AI-enabled recommendations have the potential to insert these products into the consideration set of the consumer. But simply having visibility in the right channels is not sufficient, consumers must also believe that the recommendation is relevant and credible(Satinet et al., 2025).

Hence, this study treats the AI-enabled eco-friendly product recommendation as a decision supportive situation. Like the platform, the consumer recognizes that this is a sustainable alternative— but the consumer still judges whether the recommendation is understandable (Rohden & Espartel, 2024), personally relevant, credible, and authentic (Satinet et al., 2025). This reasoning facilitates the selection of PRE, EPF, ECC, TRA, and EPI as main constructs.

AI-Enabled Product Recommendation Systems

Product proposal schemes propelled by AI are popular on most online shopping techniques, portable business applications, and computerized commercial centers. These systems assist customers by filtering a wide range of options available and instead recommending products that may be of interest to them. By doing so, recommendation systems will minimize search effort and make shopping hassle-free(Yin et al., 2025a).

But consumer uptake of a recommendation goes beyond mere technical accuracy (Rohden & Espartel, 2024). A platform can recommend a product, but the consumer continues to assess if that recommendation is clear, relevant, helpful, trustworthy. A recommendation that seems arbitrary, vague, or too salesy may not be one a consumer acts on.(Guttmann & Ge, 2024).

When recommendation systems are used for eco-friendly products, the evaluation becomes more complex. Consumers must judge both the product recommendation and the sustainability claim attached to the product. Therefore,(Ketkaew & Komsing, 2025) AI-enabled eco-friendly recommendations should be studied as a combination of technology-based decision support and sustainability communication(Isac et al., 2025).

Digital commerce utilizes AI-empowered recommendation systems to recommend based on consumer preferences and information captured by the platform. These systems potentially simplify shopping by reducing the number of options as well as offering goods that match consumer preferences (Yin et al., 2025a). And the consumer responsiveness to a recommendation goes beyond the mere fact that a recommendation exists. Consumers, whether they know it or not, will weigh the clarity, relevance, trustworthiness, and usefulness of the recommendation towards their decision(Rohden & Espartel, 2024).

Recommendation Explainability

Explainability may also support perceived fairness in recommendation systems. When consumers can see the reason for a recommendation, they may feel that the platform is not simply pushing a product randomly or commercially. This can make the recommendation process appear more open and understandable. However, (Guttmann & Ge, 2024) assert that explanation needs to be meaningful from the consumer's point of view, not only technically available.

In many online platforms, explanations are very brief. A recommendation may say that a product is suggested because it is popular, because other customers viewed it, or because it matches previous browsing behavior. These explanations can help users understand the surface logic of the recommendation (Yin et al., 2025a), but they may not fully address deeper concerns about environmental credibility or product relevance(Guttmann & Ge, 2024).

For this reason, the present study does not treat explainability as the only principal factor. Explainability is included because it is part of responsible AI communication, but it is tested alongside personalization fit (Xu & Chen, 2025) and environmental-claim credibility. This allows the study to compare whether explanation is as important as relevance and credibility in the eco-friendly recommendation context (Guttmann & Ge, 2024).

We know that AI systems are often seen as black boxes, recommendation explainability is crucial. As an example, when one consumer gets a recommendation, it may not be clear right away why the recommendation was given. (Guttmann & Ge, 2024) state that it can be easier for the customer to understand the recommendation by using explanation clarifying the relevancy which can be based on product category, product category, price, customer preference, ratings, sustainability features, or others visible attributes.

Finally, for sustainable product recommendations, explainability can play a role by indicating to consumers the relationship between preferences and the eco-friendly product. For example, if a platform explains that a product (Yin, Qiu, & Wang, 2025b) is recommended because it matches previous shopping preferences and has sustainability features, the consumer may find the recommendation easier to evaluate (Guttmann & Ge, 2024; Satinet et al., 2025).

On the other hand, if simply explaining does not help. One might think that a compelling recommendation is the end of the story, but if product does not follow consumer need, and sustainability claim is not credible, the recommendation is not effective. Hence, this research examines explainability in combination with eco-personalization fit and environmental-claim credibility. (Guttmann & Ge, 2024; Hassan et al., 2025).

(Guo, Wei, & Guo, 2026) define Recommendation explainability is the extent to which a user can comprehend the reason a product has been recommended. In an AI-enabled shopping environment, a recommendation might seem more acceptable if a rational rationale justifying the recommendation is offered by the platform (e.g., price, ratings, sustainability characteristics, or product properties) (Guttmann & Ge, 2024). So, while explainability can enhance transparency (Rahman, 2025), the true relationship between the degree of explanation and consumer response is likely conditional on whether the

degree of explanation is sufficient to facilitate trust or intention. The concept of explainability has been examined in this study as a stimulus which may play a role in relationships with trust and purchase intention.(Yin et al., 2025a).

Eco-Personalization Fit

Personalization fit can influence consumer response because it reduces the mental distance between the consumer and the recommended product. A general eco-friendly product may seem good in principle, but a personalized eco-friendly product may feel more useful and realistic (Yin et al., 2025a). This is why the fit between the recommendation and the consumer's preferences is important (Xu & Chen, 2025).

Eco-personalization fit also reflects the platform's ability to combine environmental preference with ordinary shopping preference. A consumer may not want sustainability to replace product quality or affordability (Satinet et al., 2025). Instead, the consumer may prefer a recommendation that integrates both (Ding et al., 2025). This makes EPF an important construct in sustainable digital marketing(Alsaffarini & Awwad, 2026; An & Ngo, 2025; Hassan et al., 2025).

If the recommendation fits the consumer's needs, the consumer may not need to spend as much effort searching for alternatives. This can increase the perceived usefulness of the recommendation system (Xu & Chen, 2025). In addition, a good fit may make the platform appear more knowledgeable, which is why EPF is expected to be associated with trust(Hassan et al., 2025).

Eco-personalization fit is important because consumers usually consider several criteria before buying a product. Even when a product is environmentally friendly, consumers may still evaluate price, quality, brand, convenience, design, and product usefulness (Yin et al., 2025a). A recommendation becomes more persuasive when the eco-friendly option also fits these ordinary purchase preferences (Satinet et al., 2025).

This construct is different from general personalization because it includes both personal product fit and sustainability interest. A consumer may prefer eco-friendly products, but the recommendation must still match the consumer's actual needs (Xu & Chen, 2025).

For this reason (Hassan et al., 2025), eco-personalization fit can be seen as a bridge between sustainable intention and practical purchase evaluation.

Eco-personalization fit may also support trust. If the platform recommends an eco-friendly product that matches the consumer's interests, the consumer may believe that the system understands their needs (Xu & Chen, 2025). This can make the recommendation process appear more dependable and user-centered (Hassan et al., 2025).

Eco-personalization fit refers to the degree to which an eco-friendly product that is recommended, aligns with the personal interests, needs & sustainability interest of the consumer (Yin et al., 2025a). When it comes to sustainable e-commerce, targeting known product fit becomes secondary too if the platform intelligently understands the consumer shopper's environmentally sensitive habits. So, a recommendation that is more closely connected to product preference and concern for the environment is more likely to feel context relevant (Xu & Chen, 2025). This relevance has a direct spillover in purchase intention and a peripheral spillover of establishing faith in the recommender system. (Hassan et al., 2025).

Environmental-Claim Credibility

Credibility is especially important as greenwashing concerns can undermine consumer trust. Consumers may not trust the product and the platform if product claims regarding sustainability may be an exaggeration, or the puffery of only marketing a product (Koch & Denner, 2025). This may also lead to a decrease in the effectiveness of suggestions for sustainable products (Isac et al., 2025).

Relevant environmental information will also strengthen the recommendation by ringing low odds of doubt. An eco label and certification mark, for instance, is an indication that this claim has some evidence. As (Ki & Kim, 2022) point out, if a claim can be evaluated more easily then consumers will trust the information more— if it states what materials can or cannot be recycled, is energy-efficient, has less package, or meets sustainability thresholds (Koch & Denner, 2025).

An AI-enabled recommendation context is a place where credibility does not only stick to the product but also to the platform. If the platform repeatedly presents weak or vague

sustainability claims, consumers may question the reliability of the recommendation system. Therefore, ECC is linked with trust in the proposed model(Isac et al., 2025).

One of the fundamental issues in sustainable marketing is environmental-claim credibility, because only with true green claims can consumers be certain. Products are often marketed using labels like green, natural, biodegradable, eco-friendly, or sustainable (Koch & Denner, 2025). Overall, this information can be misunderstood and interpreted as vague or even hype if there is no tangible proof.(Isac et al., 2025).

The reason is that credible environmental claims drive down this uncertainty. Details reasoning behind these and providing information in the form of eco-labels, certificates, recognized standards, clear product details, or sustainability reason signatures, other information needed to help consumers make an informed judgment to regard the claims to be higher credibility (Koch & Denner, 2025). In a recommendation by an AI system it is thus publicly viewed by the consumer as an addition to their evaluation with regard to the platform and with regard to the product.(Ki & Kim, 2022).

We disentangle environmental-claim credibility from recommendation explainability in this work, as knowing why a product was recommended does not automatically lead to believing that the product is in fact sustainable (Guttmann & Ge, 2024). Some good explanation of a recommendation may exist, but still cannot be convincing enough for a consumer, and an environmental claim can still find a refusal.(Isac et al., 2025).

Eco-Friendly Products: Environmental-Claim Credibility Consumers may not know if the sustainability claims are true, outright lies or just marketing hyperbole. Reliable environmental information, certifications, (eco labels), and consistent product claims have an impact to lessen possibilities thereby making room for doubt. As long as the sustainability information the platform presents seems accurate and real, consumers may be more likely to follow the recommendation (Isac et al., 2025). Yet, (Sarstedt & Moisescu, 2024) note that credibility not necessarily leads to purchase intention: it operates through trust first..

Trust in AI-Enabled Eco-Product Recommendations

Trust can be understood as a confidence-building factor in online decision making. Consumers tend to make online decisions without ever considering the product physically or interacting with the seller. They rely on the details provided by that platform Tag: Product descriptions reviews ratings and recommendations (Xu & Chen, 2025). Trust provides a level of security for consumers as they consider a recommendation in this setting(Hassan et al., 2025).

In the case of AI, trust is even more critical because consumers might view the recommendation as automated and therefore less personal. So, consumers might ask whether the system is doing so because the product is really the right thing or because the platform wants to boost sales? Trust helps reduce this suspicion(Hassan et al., 2025).

The trust construct in this study captures reliability, knowledge, consumer interest, and confidence in using the recommendation. According to (Xu & Chen, 2025) These dimensions are suitable because they reflect how consumers evaluate whether the AI-enabled recommendation system can be depended upon when choosing eco-friendly products(Hassan et al., 2025).

Trust in this study refers to the consumer's confidence that the recommendation system provides reliable, knowledgeable, and dependable suggestions(Xu & Chen, 2025). Since the consumer cannot directly observe the internal algorithm, trust becomes a practical basis for accepting or rejecting the recommendation(Guttman & Ge, 2024).

Trust is also important because AI-enabled eco-friendly recommendations involve two types of uncertainty. The first is technology uncertainty, where the consumer might not understand the system's selection of products (Xu & Chen, 2025). The second is sustainability uncertainty, where the consumer may be uncertain about the veracity of the environmental claim (Isac et al., 2025). Trust reduces both kinds of uncertainty.

The model expects trust to play a central role because consumers are more likely to consider a recommendation when they believe that the platform is reliable and supports their interests (Sarstedt & Moisescu, 2024). Trust therefore links the recommendation-related cues with purchase intention(Hassan et al., 2025).

Trust represents the consumer's confidence that the platform provides reliable, knowledgeable, and dependable recommendations. In the case of AI-assisted eco-friendly product recommendations, trust is crucial since consumers rely on the platform to understand product information and sustainability claims. Reducing uncertainty is important, and (Sarstedt & Moisesescu, 2024) highlights, consumers are more likely to follow your advice if they trust you.(Hassan et al., 2025).

Purchase Intention toward AI-Recommended Eco-Friendly Products

It is a mix of rational and emotional factors that drive purchase intention. A consumer could honestly determine the quality and price of products, the new environmental data, or even may feel more confident about it if the platform seems trustworthy (Isac et al., 2025). Therefore, purchase intention is treated as the final response that follows from both recommendation cues and trust(Hassan et al., 2025).

For eco-friendly products, intention may also reflect the consumer's willingness to support sustainable consumption. However, willingness to support sustainability may not be enough when product information is unclear or when the recommendation seems irrelevant (Satinet et al., 2025). This supports the need to examine purchase intention together with explainability, personalization fit, environmental-claim credibility, and trust(Isac et al., 2025).

This study is indicator to our knowledge of ewom in e-commerce platforms and purchase intention. If platforms have an idea which features might improve the intention to purchase, they can modify recommendation interfaces to help consumers select products that result in a more sustainable fulfilment.(Satinet et al., 2025).

The dependent variable is purchasing intention, as the study is concerned with the willingness to buy from this wall, not with actual buying behavior. As (Hair & Alamer, 2022)"This would have been for a survey project based on inception/proposal. Then you would ask, would you buy or if you would consider buying eco-friendly products recommended, from an AI.

In purchasing behavior for sustainable e-commerce, the intention may rely on environmental and even practical considerations (Cam, 2023; Sobgo, Sun, Atingabili,

Kewou, & Tcheudjeu, 2025). A consumer might be an advocate for sustainability but still feel reluctant if the product is perceived as expensive, alien, irrelevant or untrustworthy (Ahmed et al., 2024). As a result, it is essential to analyze purchase intention and recommendation relevance (Satinet et al., 2025), credibility, and trust simultaneously.(Isac et al., 2025).

The present study measures purchase intention through statements about buying the recommended eco-friendly product, buying similar recommended sustainable products in the future, choosing the eco-friendly option over a regular alternative, and being encouraged by the product's eco-friendly nature.

Purchase intention reflects the consumer's willingness to buy the recommended eco-friendly product or to buy similar sustainable products in the future. It is an important outcome in sustainable e-commerce because platforms seek not only to display eco-friendly products but also to support consumer choice (Isac et al., 2025). The study examines whether purchase intention is related directly to recommendation explainability, eco-personalization fit, and environmental-claim credibility, and indirectly through trust(Hassan et al., 2025).

2.3 Literature Gap

A further gap is the limited attention to eco-personalization fit as a distinct concept. General personalization has been widely discussed in digital marketing (Ding et al., 2025), but eco-personalization requires the recommendation to match both personal consumption needs and sustainability-related interests (Xu & Chen, 2025). This dual fit is important because sustainable products must be relevant in both practical (Hassan et al., 2025) and environmental terms(Satinet et al., 2025).

Another gap is the limited research on environmental-claim credibility the aspect, many authors talk about even backend green marketing but probably less linked to the AI-enabled recommendation systems (Guttmann & Ge, 2024). Credibility is studied as an element of the recommendation environment, as consumers use cues from sustainability claims, while they are evaluating the product recommendation.(Isac et al., 2025; Satinet et al., 2025).

Trust is the key mechanism in this research which fills the gap of the mediation itself in the study. Rather than assuming recommendation features question Purchase Intention more directly, the model examines the extent to which trust explains the relationship (Hassan et al., 2025).As (Sarstedt & Moisesescu, 2024) online, This allows the model to be more applicable to a study of recommendation acceptance in the presence of significant uncertainty..

Recent works on AI recommendations revolve around personalization, correctness or transparency (Rohden & Espartel, 2024). However, green product recommendations require additional attention as consumers are also evaluating sustainability claims (Guttmann & Ge, 2024). Even those that are well-founded may come to nothing if the green claim reads weak or unsure.(Isac et al., 2025).

Further, trust is often spoken about in this area, but little is known about what elements of recommendations can actually create trust in sustainable e-commerce (Satinet et al., 2025). This study fills that gap with a single model that considers explainability, eco-personalization fit, and environmental-claim credibility.(Isac et al., 2025).

It is also a nice model because it draws a distinction between the two types of relationships (the direct and the indirect). That makes it a study for the researcher to be aware of whether the variables associate with purchase intention directly, through trust or through both. This type of framework gives better explanation regarding why consumers accept AI on eco-friendly products recommendations.

Purchase intention does not guarantee actual purchase behavior, but it is a useful indicator of consumer readiness to buy. In survey-based consumer research, purchase intention is commonly used because it captures the consumer's stated willingness before actual transaction data are available(Hair & Alamer, 2022). This is suitable for the present study because the research examines perception-based acceptance of AI-enabled eco-friendly recommendations.

Purchase intention construct in this study reflects whether people buy the recommended eco-friendly product, if they will think about sustainable recommendations in the future, what option they would choose eco-friendly or regular, and if they would be motivated by

the eco-friendly aspect of the product. These indicators manifest future and present purchase intentions.

In sustainable e-commerce purchasing intention is determined by competing factors. While sustainability can be an important consideration for consumers, so are price, convenience, quality, habit and trust (Satinet et al., 2025). In this context, we do not assume environmental information by itself is sufficient. The study investigates the relationship between trust, personalization fit, explanation, and credibility and purchase intention in the AI recommendation setting (Isac et al., 2025).

2.4 Conceptual Framework

The conceptual framework of the study proposes that three recommendation-related stimuli are associated with trust and purchase intention. Trust is positioned as a mediating mechanism between the stimuli and purchase intention (Sarstedt & Moisesescu, 2024). The framework includes both direct paths from the independent variables to purchase intention and indirect paths through trust (Ki & Kim, 2022; Yin et al., 2025a).

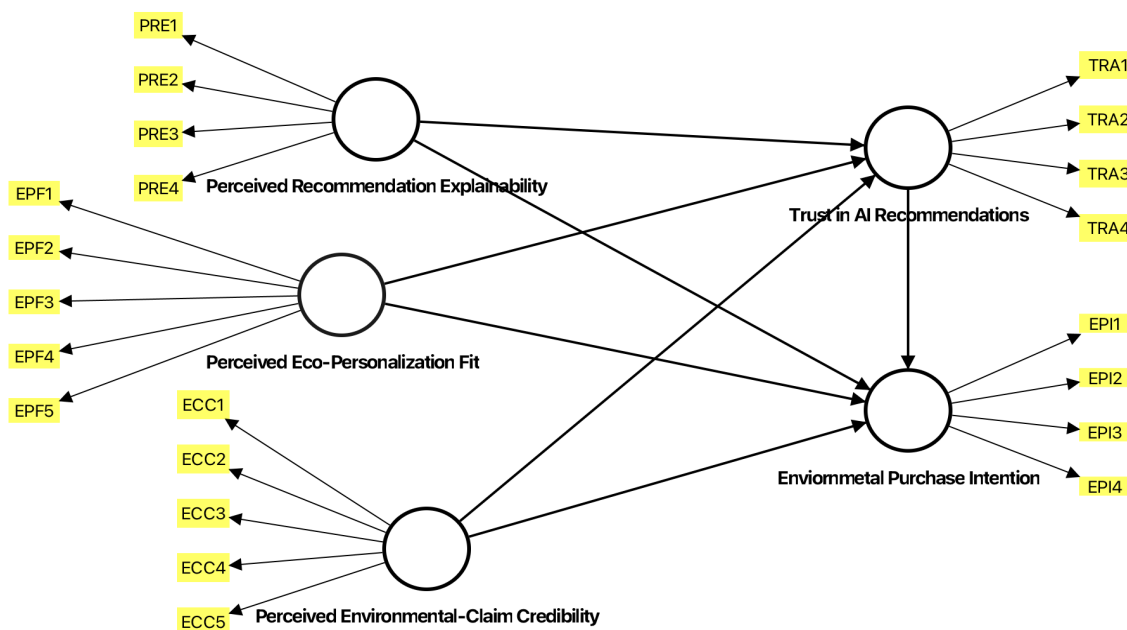


Figure 1: Conceptual Framework

2.5 Hypothesis Development

Development of Hypotheses

The hypothesis structure follows the logic that each antecedent may influence trust and purchase intention in diverse ways. PRE is expected to support understanding, EPF is expected to support relevance (Xu & Chen, 2025), and ECC is expected to support credibility (Isac et al., 2025). Trust is then expected to connect these perceptions with purchase intention (Hassan et al., 2025).

The direct hypotheses are included as consumers may form purchase intention directly from their perception of recommendation. For example, an appropriate suggestion may instantly spark the product's interest (Xu & Chen, 2025). Likewise, a credible environmental claim may make the product more attractive (Isac et al., 2025).

The mediation hypotheses are included because some effects may not be direct. Environmental-claim credibility may first build trust before it becomes related to purchase intention. This is why the study examines both direct paths and specific indirect effects through trust (Sarstedt & Moisesescu, 2024).

The hypotheses were developed from the theoretical logic and the relationships proposed in the conceptual framework. The first group of hypotheses examines whether the three antecedent variables are associated with trust. The second hypothesis examines the relationship between trust and purchase intention. The third group examines direct relationships between the antecedent variables and purchase intention. The final group examines whether trust mediates the relationship between recommendation features and purchase intention.

Perceived recommendation explainability: Clear and meaningful recommendation explanations may reduce uncertainty and support favorable consumer evaluations, although their effectiveness depends on their relevance and usefulness (Guttmann & Ge, 2024). A platform may appear to consumers in a more favorable light in case they understand the logic out of how a particular recommendation was made. However, the model also suggests that an explanation may be insufficient in cases where the product does not function properly, or where the sustainability claim is insincere.

For eco-personalization fit, the base of the expectation is higher because purchase intention is driven by personal relevance (Yin et al., 2025a). This means that even if the product is sustainable and eco-friendly, consumers won't buy it if it doesn't fit their needs, budget, product preferences or sustainability interests (Xu & Chen, 2025). Thus, it can be assumed that the fit of eco-personalization can enhance trust and purchase intention .(Hassan et al., 2025).

It is expected that even believable sustainability information will increase the trustworthiness of their environmental claims (Koch & Denner, 2025). Consumers may be more skeptical when a sustainability message feels less tangible. But if the evidence is sufficiently credible to the extent that the potential consumer can trust it, either via certificates or even palpable indicators of sustainability, these recommendations would not be so overshadowed (Ki & Kim, 2022). The direct relationship with purchase intention is also examined because credible green claims may encourage consumers to consider the product(Isac et al., 2025).

We expect trust to be positively related to purchase intention, because consumers are more likely to consider a recommended product if they believe that the recommendation system is reliable and in their best interest (Isac et al., 2025). In the present study, trust is not only an outcome of recommendation cues but also a mechanism that links recommendation cues to purchase intention.(Hassan et al., 2025).

The mediation hypotheses are important because the model assumes that some recommendation features may influence purchase intention through trust. This is especially relevant for environmental-claim credibility. Consumers may not buy a product only because the environmental claim is credible; rather,(Sarstedt & Moisesescu, 2024) suggest that the credible claim may first help build trust in the recommendation, which then supports purchase intention.

Table 2 : Hypotheses of the Study

Hypothesis	Relationship	Statement
H1a	PRE -> TRA	Perceived recommendation explainability has a positive
H1b	EPF -> TRA	Perceived eco-personalization fit has a positive

Hypothesis	Relationship	Statement
H1c	ECC -> TRA	Perceived environmental-claim credibility has a positive
H2	TRA -> EPI	Trust is positively associated with purchase intention.
H3a	PRE -> EPI	Perceived recommendation explainability has a positive
H3b	EPF -> EPI	Perceived eco-personalization fit has a positive
H3c	ECC -> EPI	Perceived environmental-claim credibility has a positive
H4a	PRE -> TRA -> EPI	Trust mediates the relationship between PRE and EPI.
H4b	EPF -> TRA -> EPI	Trust mediates the relationship between EPF and EPI.
H4c	ECC -> TRA -> EPI	Trust mediates the relationship between ECC and EPI.

CHAPTER III: RESEARCH METHODS

3.1 Research Design

This study used a quantitative, cross-sectional research design. A structured questionnaire was used to collect respondent perceptions about AI-enabled eco-friendly product recommendations. The quantitative approach was appropriate for the study as it was designed to test the hypothesized relationships among latent constructs through statistical analysis. The design was cross-sectional and suited for the purpose as the data was collected from the respondents at one point in time.(Hair & Alamer, 2022).

The study applied a survey-based explanatory design. The purpose was not only to describe consumer perceptions but also to assess how recommendation explainability, eco-personalization fit, and environmental-claim credibility are related to trust and purchase intention. Following the methodological frameworks of (Hair & Alamer, 2022), the analysis combined Python-based preliminary statistical analysis with PLS-SEM analysis in SmartPLS (Ringle, Sarstedt, Sinkovics, & Sinkovics, 2023).

3.2 Sample

The study used a non-probability convenience sampling approach because the target respondents were general consumers with experience or awareness of online shopping and AI-enabled product recommendations. The final sample consisted of 153 valid

responses after data screening. Although the sample size of 153 is acceptable for PLS-SEM because the model contains a limited number of predictors and uses bootstrapping for significance testing, the demographic distribution shows clear limitations. The sample is strongly male-dominated and concentrated within the 21-30 age range. Therefore, the findings should be interpreted as evidence from a young, convenience-based consumer sample rather than as a fully representative consumer population.

3.3 Model Specification

The questionnaire was developed around the final conceptual model. Drawing on the frameworks established by (Hassan et al., 2025; Xu & Chen, 2025) the final model used five constructs: PRE, EPF, ECC, TRA, and EPI. Four profile questions were included to describe the respondents. The main model consisted of twenty-two indicator items measured on a five-point Likert scale, where lower values indicated disagreement and higher values indicated agreement. The questionnaire was designed to capture the perceptions of consumers after they imagined or evaluated an AI-enabled recommendation of an eco-friendly product.(Guttman & Ge, 2024; Isac et al., 2025).

Table 3 : Measurement Items

Code	Construct	Measurement statement
AGE	Profile	What is your age group?
GENDER		What is your gender?
OSF		How often do you shop online?
SK		How much do you know about environmental and sustainability issues?

Code	Construct	Measurement statement
PRE1	PRE	The reason for the recommended product was clear.
PRE2		The way personal preferences influenced the recommendation was understandable.
PRE3		The platform showed relevant recommendation factors such as price, ratings, sustainability, and eco-labels.
PRE4		The explanation or information around the recommendation was easy to understand.
EPF1	EPF	The recommended eco-friendly product matched usual product preferences such as price, quality, brand, or product type.
EPF2		The platform understood the respondent's eco-friendly interests.
EPF3		The product matched the respondent's specific sustainability interests.

Code	Construct	Measurement statement
EPF4		Personalization made the recommendation a better suggestion.
EPF5		Personalization made the eco-friendly product recommendation more relevant to the respondent's needs.
ECC1	ECC	The environmental information provided by the platform was accurate and truthful.
ECC2		The platform provided enough detail about the product's environmental impact.
ECC3		The platform supported its sustainability claims with credible sources, certifications, or eco-labels.
ECC4		The environmental information was supported by obvious signs such as eco-labels, certification marks, or sustainability claims that were understandable.
ECC5		The sustainability information seemed

Code	Construct	Measurement statement
		genuine and honest rather than like greenwashing.
TRA1	TRA	The platform gave reliable and dependable recommendations.
TRA2		The platform seemed knowledgeable about sustainable products.
TRA3		The platform's recommendations supported the respondents' best interest in choosing sustainable products.
TRA4		The respondents felt confident using the platform's recommendations when shopping.
EPI1	EPI	The respondent would buy the eco-friendly product recommended by the platform.
EPI2		The respondent would be likely to buy another sustainable product recommended by the platform in the future.
EPI3		The respondent would choose the recommended

Code	Construct	Measurement statement
		eco-friendly product over a regular alternative.
EPI4		The eco-friendly nature of the product increased the respondent's willingness to buy it.

Note. The measurement statements were developed and contextually adapted by the researcher from recent literature. They were modified to reflect AI-enabled eco-friendly product recommendations rather than copied verbatim from a single established scale.

3.4 Data Collection

Data were collected through an offline self-administered survey questionnaire during June and July 2026. Respondents were selected based on their familiarity with online shopping and their ability to evaluate AI-enabled product recommendations. Before answering the main items, respondents were informed about the academic purpose of the study and that participation was voluntary. No personal identification information was collected.

3.5 Data Analysis Plan

The data analysis was conducted in two main stages. First, Python was used for data screening, demographic profiling, descriptive statistics, reliability checking, correlation analysis, and common method bias assessment. Second, the PLS-SEM analysis was performed using SmartPLS, which encompasses evaluation of the measurement model, assessment of discriminant validity, collinearity assessment, testing of the structural model, bootstrapping and mediation analysis (Ringle et al., 2023).

SmartPLS was used with the help of bootstrapping to test the statistical significance of the direct and indirect paths as recommended by (Hair & Alamer, 2022) The model was tested using the final dataset of 153 responses, with 5,000 bootstrapping subsamples, a two-tailed test and 5% significance level.(Sarstedt & Moisesescu, 2024).

CHAPTER IV: RESEARCH FINDINGS & ANALYSIS

4.1 Introduction

In this chapter, the empirical results of the study are presented. This chapter presents data screening and demographic profile, descriptive statistics, and correlation analysis (as the perfect example). Chapter 4 goes through the results of SmartPLS, after the preliminary Python analysis it presents measurement model assessment, discriminant validity, collinearity test, structural model assessment, mediation analysis, and summary of hypotheses.

4.2 Data Screening

The primary analysis was preceded by screening of the dataset. A screening process examined the size of valid data for responses, missing values, duplicate responses, invalid Likert-scale values, and whether straight-lining could be an issue. Out of them, 153 responses were considered valid. There were no missing values, no duplicate rows, and no invalid Likert-scale values that were identified. Indeed, there were nineteen potential straight-lining cases, but they were kept as these straight-lining respondents did not have invalid or missing values. So, the final analysis of 153 responses was intact.

Table 4 : Data Screening Summary

Criterion	Result
Total valid responses	153
Missing values in dataset	0
Duplicate rows	0
Invalid Likert values	0
Potential straight-lining cases	19
Final responses retained	153

The nineteen potential straight-lining cases were retained because they did not contain missing values, duplicate entries, invalid Likert-scale values, or incomplete responses. However, their presence is acknowledged as a limitation because repeated response

patterns may affect the stability of survey-based findings. A future study may apply a stricter response-quality screening procedure or conduct sensitivity analysis by comparing results with and without such cases.

4.3 Demographic Profile

The demographic profile was examined using frequency and percentage distributions. Most respondents were between 26 and 30 years old, and the sample was male. In terms of online shopping frequency, the largest group reported monthly online shopping, followed by rarely, weekly, and daily shopping. Sustainability knowledge was moderate to high, with many respondents selecting scores 4 and 5.

Table 5 : Demographic Profile

Variable	Category	Frequency	Percentage
Age group	21-25 years	64	41.83
	26-30 years	89	58.17
Gender	Female	9	5.88
	Male	144	94.12
Online shopping frequency	Rarely	38	24.84
	Monthly	72	47.06
	Weekly	31	20.26
	Daily	12	7.84
Sustainability knowledge	Score one	9	5.88
	Score two	9	5.88
	Score three	30	19.61
	Score four	74	48.37
	Score five	31	20.26

4.4 Descriptive Statistics

Descriptive statistics were calculated for the five main constructs. The mean values of all constructs were above the midpoint of the five-point scale, indicating moderate perceptions. Purchase intention recorded the highest mean value, followed by perceived recommendation explainability. Eco-personalization fit, environmental-claim credibility, and trust also showed moderate mean scores.

Table 6 : Descriptive Statistics of Constructs

Construct	N	Mean	SD	Min	Max	Level
PRE	153	3.562	0.797	1.25	5.0	Moderate
EPF	153	3.268	0.791	1.4	5.0	Moderate
ECC	153	3.366	0.812	1.0	5.0	Moderate
TRA	153	3.356	0.922	1.0	5.0	Moderate
EPI	153	3.57	0.839	1.0	5.0	Moderate

4.5 Correlation Analysis

Pearson correlation analysis was conducted to examine the preliminary associations among the main constructs. The results indicated positive relationships among the constructs. The strongest relationships were found between trust and purchase intention, environmental-claim credibility and trust, and eco-personalization fit and purchase intention. None of the correlations exceeded .85, indicating that no extremely high bivariate association was observed; formal structural collinearity was assessed separately through the inner VIF values(Hair & Alamer, 2022).

Table 7 : Pearson Correlation Matrix

	PRE	EPF	ECC	TRA	EPI
PRE	1.000	0.152	0.214	0.201	0.193
EPF	0.152	1.000	0.283	0.465	0.647
ECC	0.214	0.283	1.000	0.724	0.530

	PRE	EPF	ECC	TRA	EPI
TRA	0.201	0.465	0.724	1.000	0.728
EPI	0.193	0.647	0.530	0.728	1.000

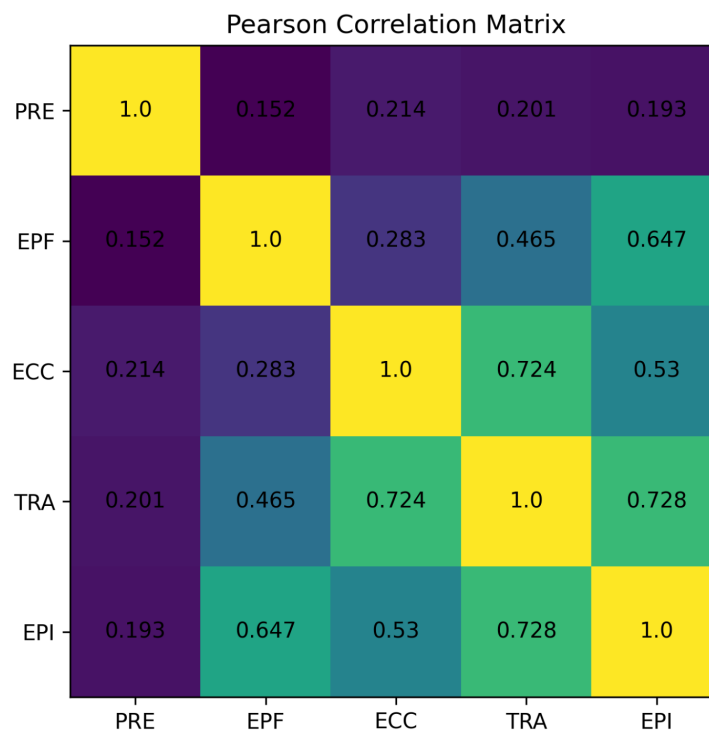


Figure 2 : Pearson Correlation Matrix

4.6 Common Method Bias Assessment

Because the variables were collected through a single self-reported questionnaire, Harman's single-factor test was conducted as a preliminary common-method-bias diagnostic. The first factor explained 35.68% of the total variance, which was below the conventionally used 50% level. However, Harman's test cannot conclusively establish the

absence of common method bias. Therefore, the result indicates only that no single factor dominated the observed variance(Howard, Boudreaux, & Oglesby, 2024).

Table 8 :Common Method Bias Assessment

Test	First factor variance (%)
Harman single-factor test	35.68

4.7 Measurement Model Evaluation

The outer loadings of the indicators were examined to assess indicator reliability. Most indicators showed acceptable or strong loadings on their respective constructs. EPF1 and ECC4 had comparatively lower loadings but were retained because deleting them would not meaningfully improve construct reliability and convergent validity, while the items contributed to the constructs' content coverage(Hair & Alamer, 2022; Ringle et al., 2023). Therefore, all final model indicators were retained.

Table 9 : Indicator Loadings

Item	Construct	Outer loading
ECC1	ECC	0.793
ECC2	ECC	0.830
ECC3	ECC	0.809
ECC4	ECC	0.664
ECC5	ECC	0.749
EPF1	EPF	0.597
EPF2	EPF	0.708
EPF3	EPF	0.800
EPF4	EPF	0.701
EPF5	EPF	0.776
EPI1	EPI	0.861
EPI2	EPI	0.770
EPI3	EPI	0.865
EPI4	EPI	0.742

Item	Construct	Outer loading
PRE1	PRE	0.800
PRE2	PRE	0.704
PRE3	PRE	0.767
PRE4	PRE	0.742
TRA1	TRA	0.841
TRA2	TRA	0.864
TRA3	TRA	0.912
TRA4	TRA	0.837

Internal Consistency Reliability and Convergent Validity

Internal consistency reliability was assessed using Cronbach's alpha, rho_A, and composite reliability. Convergent validity was assessed using average variance extracted. The results show that all constructs achieved acceptable reliability and AVE values above .50. Therefore, the measurement model met the required standards for reliability and convergent validity(Hair & Alamer, 2022; Ringle et al., 2023).

Table 10: Reliability and Convergent Validity

Construct	Cronbach alpha	rho_A	CR	AVE
ECC	0.829	0.841	0.879	0.595
EPF	0.767	0.786	0.842	0.518
EPI	0.826	0.841	0.885	0.658
PRE	0.747	0.752	0.840	0.568
TRA	0.887	0.888	0.922	0.747

4.8 Discriminant Validity

Fornell-Larcker Criterion

The Fornell-Larcker criterion was examined to assess whether each construct was sufficiently distinct from the others. The diagonal values were higher than the

corresponding inter-construct correlations in the same columns and rows, indicating acceptable discriminant validity(Hair & Alamer, 2022; Ringle et al., 2023).

Table 11: Fornell-Larcker Criterion

	ECC	EPF	EPI	PRE	TRA
ECC	0.771				
EPF	0.308	0.720			
EPI	0.536	0.656	0.811		
PRE	0.214	0.167	0.195	0.754	
TRA	0.730	0.486	0.733	0.204	0.864

HTMT Ratio

The HTMT ratio was also evaluated as a stronger test of discriminant validity. Most values were below the conservative .85 threshold. However, the TRA–ECC value of .844 and TRA–EPI value of .849 were extremely close to .85. Therefore, discriminant validity was retained, although the closeness of these values should be acknowledged when interpreting the constructs(Ringle et al., 2023; Sarstedt & Moisesescu, 2024).

Table 12: HTMT Results

Construct pair	HTMT
EPF <-> ECC	0.383
EPI <-> ECC	0.638
EPI <-> EPF	0.809
PRE <-> ECC	0.272
PRE <-> EPF	0.245
PRE <-> EPI	0.244
TRA <-> ECC	0.844
TRA <-> EPF	0.558

Construct pair	HTMT
TRA <-> EPI	0.849
TRA <-> PRE	0.248

4.9 Collinearity Assessment

Inner VIF values were examined to identify multicollinearity among predictor constructs. All VIF values were below 3.3, indicating that collinearity was not a serious issue in the structural model (Hair & Alamer, 2022; Ringle et al., 2023).

Table 13: Inner VIF Values

Structural path	VIF
ECC -> EPI	2.175
ECC -> TRA	1.139
EPF -> EPI	1.327
EPF -> TRA	1.118
PRE -> EPI	1.062
PRE -> TRA	1.061
TRA -> EPI	2.549

Structural Model Assessment

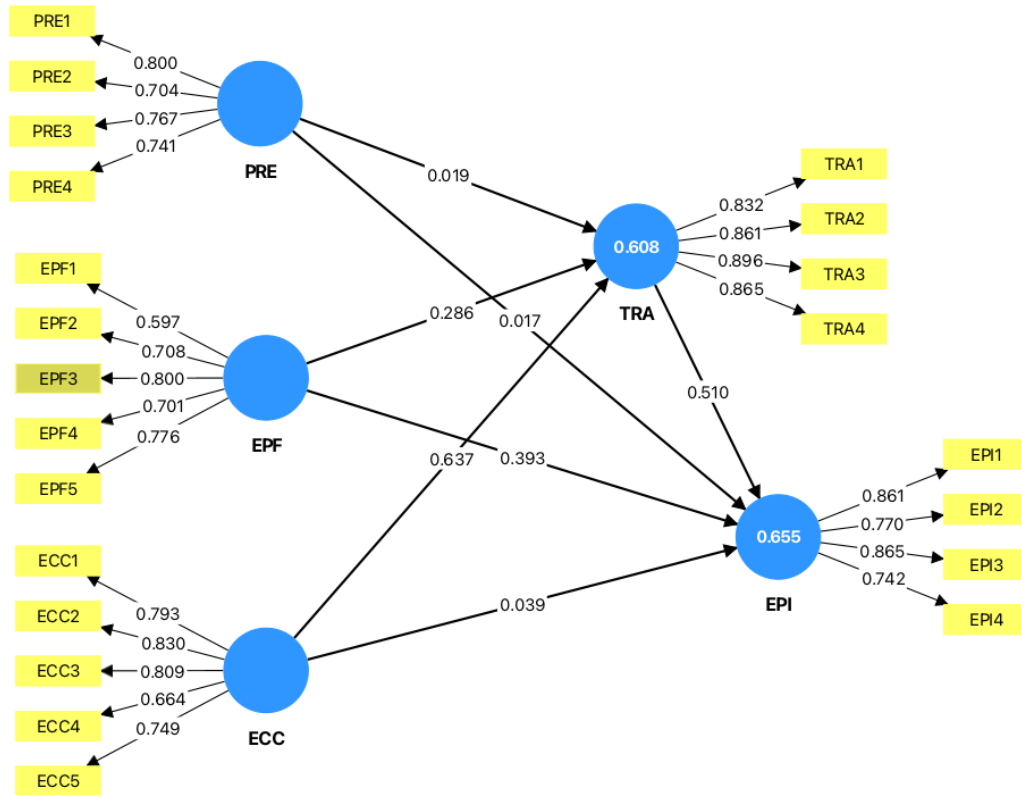


Figure 3 : Final Structural Model

Coefficient of Determination

The coefficient of determination was assessed using R-square values. The model accounted for 60.8% of the variance in trust and 65.5% of the variance in purchase intention. as supported by (Hair & Alamer, 2022; Ringle et al., 2023) ,these values indicate moderate to strong explanatory capacity for both endogenous constructs within the tested model.

Table 14 : R-square Values

Endogenous construct	R-square	Adjusted R-square	Interpretation
TRA	0.608	0.600	Moderate to strong explanatory power
EPI	0.655	0.646	Moderate to strong explanatory power

Effect Size

The f-square values show the relative contribution of each predictor to the endogenous constructs. Environmental-claim credibility has had a large effect on trust. Eco-personalization fit and trust showed meaningful effects on purchase intention. In contrast, (Hair & Alamer, 2022; Ringle et al., 2023) recommendation explainability had no meaningful effect on either trust or purchase intention

Table 15 : Effect Size

Path	f-square	Interpretation
ECC -> EPI	0.002	No meaningful effect
ECC -> TRA	0.909	Large
EPF -> EPI	0.338	Medium-to-large
EPF -> TRA	0.186	Medium
PRE -> EPI	0.001	No meaningful effect
PRE -> TRA	0.001	No meaningful effect
TRA -> EPI	0.296	Medium

Direct Path Coefficients

Bootstrapping with 5,000 subsamples was utilized to evaluate the significance of the direct structural paths. These results showed that EPF was significantly related to TRA

together with EPI, ECC was significantly related to TRA, and TRA was significantly responsible for EPI. Finally, PRE was not a strong predictor for either TRA or EPI, and ECC was not associated directly with EPI. Table 16 contains the decision column that summarizes the hypothesis test solutions depending on the p-value threshold of 0.05(Hair & Alamer, 2022).

Table 16 : Direct Path Coefficients

Hypothesis	Path	Beta (O)	t-value	p-value	Decision
H1a	PRE -> TRA	0.019	0.347	0.729	Not supported
H1b	EPF -> TRA	0.286	4.597	<0.001	Supported
H1c	ECC -> TRA	0.637	13.606	<0.001	Supported
H2	TRA -> EPI	0.510	6.257	<0.001	Supported
H3a	PRE -> EPI	0.017	0.307	0.759	Not supported
H3b	EPF -> EPI	0.393	6.764	<0.001	Supported
H3c	ECC -> EPI	0.039	0.499	0.618	Not supported

4.10 Mediation Analysis

The mediation results were assessed through specific indirect effects. The results indicate two different mediation patterns. First, eco-personalization fit has both a significant direct path to purchase intention and a significant indirect path through trust, indicating partial mediation. This means that eco-personalization fit is related to purchase intention both directly and through trust. Second, environmental-claim credibility has no significant direct path to purchase intention but has a significant indirect path through trust, indicating indirect-only mediation. This means that environmental-claim credibility is related to purchase intention through stronger trust. Utilizing the mediation evaluation frameworks of (Hair & Alamer, 2022; Sarstedt & Moisesescu, 2024) ,the indirect effect of perceived recommendation explainability through trust was not significant.

Table 17: Specific Indirect Effects

Hypothesis	Indirect path	Indirect effect	t-value	p-value	95% CI	Decision
H4a	PRE -> TRA -> EPI	0.010	0.341	0.733	[-0.041, 0.075]	Not supported
H4b	EPF -> TRA -> EPI	0.146	4.244	<0.001	[0.078, 0.212]	Supported
H4c	ECC -> TRA -> EPI	0.325	5.624	<0.001	[0.208, 0.435]	Supported

4.11 Summary of Hypotheses

Table 18 : Summary of Hypothesis Testing

Hypothesis	Relationship	Decision
H1a	PRE -> TRA	Not supported
H1b	EPF -> TRA	Supported
H1c	ECC -> TRA	Supported
H2	TRA -> EPI	Supported
H3a	PRE -> EPI	Not supported
H3b	EPF -> EPI	Supported
H3c	ECC -> EPI	Not supported
H4a	PRE -> TRA -> EPI	Not supported
H4b	EPF -> TRA -> EPI	Supported
H4c	ECC -> TRA -> EPI	Supported

CHAPTER V: DISCUSSION

5.1 Discussion of Major Findings

This chapter interprets the findings in relation to the research objectives and the proposed conceptual model. The discussion focuses on the meaning of the supported and unsupported hypotheses rather than repeating the statistical tables. Since the main analysis has been unfolded in Chapter IV, this is important.

The results indicate that recommendation relevance (Xu & Chen, 2025) and credible sustainability information (Isac et al., 2025) have a greater impact on consumers than explanation alone. While (Guttmann & Ge, 2024) It is true that this does not detract from the importance of transparency but it does mean that what transparency needs to boil down to is personal usefulness and credible environmental data..

The results provide a simple but realistic picture of how shoppers respond to AI recommendations for green products. The research's most important finding is that explaining a recommendation does not lead to purchase intentions of consumers (Xu & Chen, 2025). The proposal for an environmentally friendly product should be customized to their needs and sustainability interests (Hassan et al., 2025) and should include substantial environmental information that relates to a higher level of trust in the recommendation for them to respond accordingly .(Isac et al., 2025).

The result indicates that traditional transparency may not suffice in illuminating the non-significant role recommendation explainability plays when eco-friendly product recommendations are evaluated by consumers. This suggests the opposite: consumers may see simple recommendation explanations as basic platform information rather than an indication of real box (Guttmann & Ge, 2024). But, eco-personalization fit and environmental-claim credibility are more substantial as they directly address the product relevance and sustainability uncertainty (Isac et al., 2025). This means that, for sustainable recommendation adoption, it is not sufficient for the system to be good at explaining a recommendation, but the recommendation must also be seen as being personally relevant and environmentally plausible.

Eco-personalization fit was an important antecedent of purchase intention in the conceptual model. This allows respondents to demonstrate higher willingness to buy AI-recommended eco-friendly products when the recommendations are consistent with their baseline product desires, needs, and sustainability interests (Yin et al., 2025a). The direct path suggests that personal relevance is thus an important component of eco-friendly recommendation acceptance (Xu & Chen, 2025). Its indirect route via trust further suggests that personalization fit is also associated with trust in the platform (Hassan et al., 2025; Jasim, Puthineedi, & Jha, 2026; Vu, Ozuem, Willis, & Katz, 2026).

Environmental-claim credibility was not a direct predictor of purchase intention in the model, albeit it was strongly associated with trust. This means that credible environmental information did not automatically correspond to purchase intention. Instead, credibility was related to purchase intention through trust (Sarstedt & Moisesescu, 2024). This is an important theoretical and practical insight because it shows that sustainability credibility works through a trust-based process (Fu et al., 2025; Gattupalli, Siva Rama Krishna, & Boobalan, 2025; Isac et al., 2025; Koch & Denner, 2025).

Trust had a strong positive association with purchase intention. This supports the central role of trust in AI-enabled sustainable product recommendation systems (Zaman et al., 2025). When consumers trusted the platform's recommendation, they reported stronger purchase intention toward the recommended eco-friendly product (Hassan et al., 2025). Trust appears to act as the psychological bridge between credible and relevant recommendation signals and purchase intention (Isac et al., 2025).

5.2 Discussion of Supported Hypotheses

The supported EPF paths indicate that personal relevance is a core issue in the acceptance of sustainable recommendations. While consumers may value sustainability, they simply want organic recommendations as they are shopping in the same way they always do (Yin et al., 2025a). This finding is valuable as it suggests that eco-friendly recommendation systems should not disregard consumer preference when it comes to sustainability. (An & Ngo, 2025; Hassan et al., 2025; Jasim et al., 2026; Xu & Chen, 2025).

The ECC to TRA square strongly trust building role as sustainability credibility (Koch & Denner, 2025). Such markets are particularly relevant when consumers may face a variety of sustainability claims of differing quality (Ketkaew & Komsing, 2025). When the product is advertised as environmentally friendly, consumers may be reluctant to accept the recommendation when environmental information is not credible.(Gattupalli et al., 2025; Isac et al., 2025; Rana, Sharmin, Amin, Mishad, & Oláh, 2026).

TRA-to-EPI pathway, the significant path between TRA and EPI, suggests that trust is a precondition for the acceptance of AI-enabled eco-friendly recommendations. Even if consumers do not fully understand how the algorithm works (Xu & Chen, 2025), they may be more confident about a recommendation if it appears to be credible, relevant and has believable information behind it (Hassan et al., 2025).

The tested hypotheses reveal that eco-personalization fit, environmental-claim credibility, and trust are the most substantive components of the model. Trust significantly mediated the relationship between EPF and purchase intention, implying that respondents preferred recommendations compatible with their own preferences and sustainability concerns (Xu & Chen, 2025). Such a finding makes sense as consumers are known to assess products across functional and environmental attributes.(Hassan et al., 2025; Satinet et al., 2025).

ECC is significantly related to trust, meaning that credible environmental information is incredibly important in recommendations context on sustainable e-commerce. A consumer may not be able to validate every sustainability claim independently so they rely on the claim quality of the platform, eco-label, certifications and straightforward sustainability evidence (Ki & Kim, 2022; Koch & Denner, 2025). These signals, if they seem to be credible, may reinforce trust in the recommendation system.(Isac et al., 2025).

The strong relationships of trust with purchase intentions confirm the importance of trust as a key component in the model. Working as eco-friendly product recommendations causes psychological state trust, which erodes trust in AI-based eco-friendly product recommendations. Sustainable product recommendations involve uncertainty about the technology and uncertainty about the environmental claim side.(Hassan et al., 2025; Isac et al., 2025).

The results of the mediation is also in ways that support the trust base nature of the model (Sarstedt & Moisesescu, 2024). Findings showed that EPF was not only linked to purchase intentions directly, but also indirectly (partial mediation) through trust. The findings showed that ECC led to purchase intention indirectly through trust, but credibility must be converted to trust before it can be related to purchase intention. This nicely explains how sustainability credibility is used in the recommendation process.

5.3 Discussion of Unsupported Hypotheses

The unsupported PRE paths should be interpreted carefully. The result does not mean that platforms should remove explanations. Instead ,as (Guttmann & Ge, 2024) it suggests that basic explanation may work as a supporting feature rather than a main predictor of trust or purchase intention in this sample(Gao, Wang, Sun, & Lyu, 2026; Liu & Wang, 2025).

The direct route from ECC to EPI without support is also important The results indicate that credibility does not necessarily lead to purchase intention unless it is accompanied by trust (Sarstedt & Moisesescu, 2024). That makes sense – consumers may need to be convinced that a sustainability claim is authentic (Isac et al., 2025; Martínez, Cardona, Ramírez, & Quiceno, 2025), but they also need to build confidence in the platform, and in the recommendation, before moving on to purchase intention (Nguyen & Duong, 2025).

These untested results are useful for refining the model, since they show that not all recommendation features have the same functionality. Some attributes may be related to purchase intention, while some may be indirectly related through trust. So this is another support for the trust-based interpretation of the study (Sarstedt & Moisesescu, 2024).

The unsupported hypotheses are also important because they clarify the limits of recommendation explainability. PRE was not significantly associated with trust or purchase intention in the final model. This does not mean that explanation is unimportant in every AI recommendation setting. Instead, it implies that, in the realm of eco-friendly product recommendations, simple explanation alone may not be sufficient.

This may be because consumers are already expecting online platforms to include basic product information and the reasons for recommending products. If explanation is just

considered part of the normal platform information, it will not consider strongly differentiating the recommendation or build trust. On the other hand, given that it concerns consumer practical needs and sustainability concerns more directly, personal relevance (Yin et al., 2025a) and credible environmental information could have larger effect size (Guttmann & Ge, 2024).

Moreover, hypotheses regarding direct effect of ECC on purchase intention were also not supported. This indicates that accessing credible environmental information does not necessarily trigger intention to buy (Isac et al., 2025). Credible sustainability claims require a recommendation process that consumers need to trust before they can drive purchasing behavior (Sarstedt & Moisescu, 2024).

This result supports the decision to include trust as a mediator in the model.

5.4 Theoretical Implications

The study contributes to the S-O-R framework by showing how recommendation and sustainability cues can be organized as stimuli in an AI-enabled shopping environment (Yin et al., 2025a). Trust represents the organism stage because it reflects consumers' internal evaluation of the platform and recommendation (Rahman, 2025) since it perfectly embodies consumers' subjective assessment of a platform and recommendation in their minds. Purchase intention acts correlatively to the response stage (Alsaffarini & Awwad, 2026; Fu et al., 2025).

Last but not least, the findings also further Signaling Theory as they reveal that signals differ in their strength (Ki & Kim, 2022). The final model showed that eco-personalization fit and environmental-claim credibility held more meaning than recommendation explainability. This implies that not every signal is equally persuasive in sustainable e-commerce.

The mediation findings provide another theoretical implication. Trust helps explain why environmental-claim credibility becomes linked with purchase intention (Sarstedt & Moisescu, 2024). Credibility did not directly predict purchase intention, but it was strongly related to trust and indirectly related to purchase intention through trust. This supports the importance of trust-based mechanisms in sustainable recommendation acceptance.

The study supports the Stimulus-Organism-Response logic by showing that recommendation-related stimuli are associated with an internal psychological mechanism and consumer response. Eco-personalization fits and environmental-claim credibility act as important stimuli. Trust works as the organismic mechanism, while purchase intention represents the response. So, even if recommendation explainability is an allusion, the relatively limited role that it plays among such factors implies that transparency signals generated by AI might not be equally relevant to choices on sustainable e-commerce (Guttmann & Ge, 2024; Yin et al., 2025a).

The results further reinforce the applicability of the Signaling Theory within sustainable e-commerce. Environmental-claim credibility, as a trust-building signal, is a very strong one, since credible sources, certifications, eco-labels and minimal sustainability information reduce uncertainty for consumers (Isac et al., 2025; Koch & Denner, 2025). Because eco-personalization fit is also a relevance signal, it demonstrates to consumers that the recommendation system has a sense of consumers needs along with a sense of their sustainability interests (Ki & Kim, 2022).

Implications for Academic Research: The findings suggest the acceptance of AI enabled-sustainable solutions should not be approached solely from a technology rationality perspective. Explainability is a plus but not sufficient for sustainable product decisions — relevance and credibility also matter (Guttmann & Ge, 2024). Consequently, this study contributes by integrating recommendation explainability, personalization fit, and environmental-claim credibility, trust, and purchase intention into one model (Satinet et al., 2025).

The model also shows that trust should be treated as an important mechanism rather than only a general positive attitude (Sarstedt & Moisescu, 2024). Trust explains why some cues become meaningful for purchase intention while others do not. Environmental-claim credibility was strongly linked with trust, but not directly with purchase intention (Isac et al., 2025). This finding highlights the importance of examining indirect relationships in sustainable consumer research.

5.5 Managerial Implications

For managers, the findings suggest that an AI-enabled eco-friendly recommendation system should not only explain the recommendation (Guttmann & Ge, 2024). It should also make the recommendation personally meaningful (Hassan et al., 2025) and environmentally believable (Isac et al., 2025). Consumers do not have the knowledge why a product was recommended but they nevertheless hesitate when they assess that the suggested product is not suitable, or the corresponding green claim seems not valid.

Thus, platforms may want to focus on better personalization. The recommended eco-friendly products must be in accordance with the consumer preferences such as price range, product category, quality expectation, sustainability interest, and many others (Yin et al., 2025a). Enhanced personalization will render sustainable products increasingly relevant (Xu & Chen, 2025), instead of being functionally indistinguishable from generic advertising material (An & Ngo, 2025; Hassan et al., 2025; Lo, Chang, & Chen, 2026; Vu et al., 2026).

Strengthening the Credibility of Environmental Claims by Managers. Using clear eco-labels, certifications, source information and information about specifics of sustainability do this (Ki & Kim, 2022). Vague or overblown green claims are best avoided as the second, previously mentioned, point is, they can decrease trust and can lead to accusations of greenwashed behavior (Isac et al., 2025; Koch & Denner, 2025).

This leads to our next implication for management: trust should be seen as a design target. Recommendation systems should be designed to enable consumer confidence, not just product exposure. You discuss many factors that contribute to trust: suggestions, information presented, sustainability communication and common sense recommendation logic (Hassan et al., 2025; Xu & Chen, 2025).

The findings have many practical implications for online platforms, e-commerce firms, and designers of AI-enabled recommendation systems. Platforms also should not just explain why a product is recommended. The results indicate that consumers respond more positively when eco-friendly recommendations are personally relevant and supported by credible environmental information (Guttmann & Ge, 2024).

Secondly, help improve the accuracy of environmental information on platforms. And as a rule, the more explicit the sustainability claims are, the more likely the claim must be based on credible information, certification, eco-label, or standards that are recognized in terms of sustainability. A company should ditch hyperbole or amorphous green claims, as this will strain consumer confidences (Guttmann & Ge, 2024).

Third, explanations should be at the same time transparent and simple. Explanations further enhance user understanding, but predicting trust or purchase intention from users would not be possible without explanation, potential recommendation matching and credibility of the environmental information.

Fourth, treat trust like a strategic goal. Trust can be supported using reliable recommendations, accurate information about the environment and consumer-centered recommendation logic (Xu & Chen, 2025). A robust recommendation framework can help platforms better present green products even (Hassan et al., 2025).

E-commerce platforms must also consider the decision logic explanation independent from the credibility messaging. Now, recently viewed for you will likely pass the user test, but that will not add to that confidence (Guttmann & Ge, 2024). The higher the level of trust in the new product and the conditions of trust in the related environmental claim, then the necessity to visually represent (Isac et al., 2025).

The results also suggest the need for platforms to avoid making green recommendations in the abstract. An unigeneric sustainable product proposal, devoid of the product cycle, may be unpersuasive if it is not aligned with the consumers budget or product preferences or shopping purpose (Xu & Chen, 2025). So essentially, personalization should make a link between sustainability features (Satinet et al., 2025) and everyday consumer concerns (Hassan et al., 2025).

The results by sustainable product sellers suggest that environmental information highly be precise and easy to comprehend. Mottled statements like "green" or "eco-friendly" might do worse than clear info back up through well-known labels, certification marks or even product details available without excess hocus-pocus (Koch & Denner, 2025). Credible communication mitigates consumer scepticism and underpins trust in the recommendation (Isac et al., 2025; Ki & Kim, 2022).

Taken together, these implications suggest that platforms should prioritize four practical areas: accurate personalization, credible sustainability evidence, simple explanation, and trust-oriented recommendation design.

5.6 Conclusions

This study examined the relationships among perceived recommendation explainability, perceived eco-personalization fit, perceived environmental-claim credibility, trust, and purchase intention toward AI-recommended eco-friendly products. The results show that eco-personalization fitness and trust are important predictors of purchase intention in the model. Environmental-claimed credibility is strongly associated with trust, and trust is then associated with an intention to buy. However, recommendation explainability was not an important predictor in the final model.

The results show that personal relevance, credible sustainability information, and trust information about an AI are factors that drive purchase intention toward eco-friendly product purchase intention, while an explanation of the recommendation has no role in it. We find a positive relationship between eco-personalization fit and purchase intention, whereas environmental-claim credibility is driven mostly by trust. Therefore, e-commerce platforms may consider designing AI recommendation systems that are not only transparent but also personally relevant, credible, and trust-enhancing.

5.7 Limitations of the Study

This will inform the interpretation of the findings. This study is the result of an opportunistic sample where a high percentage of our participants were men in the same age bracket. This means that these findings might be less generalizable to the population of consumers. Future studies with a more representative sample may yield stronger impact.

The study measured not purchase behavior but purchase intention. Respondents may say they would buy, but purchase behavior could be dependent on price, availability, awareness, income, peer, or expert review or simply habit. These findings can be bolstered by behavioral data in future studies (Satinet et al., 2025).

The study was also based on cross-sectional design. The data were cross-sectional, so it is not possible to show the mediation over time of the interaction of trust and purchase intention after repeated exposure to AI-enabled eco-friendly recommendations. In future longitudinal studies it could be investigated if trust is increased or decreased over time.

Limitations of this study exist. First, the sample was male limiting the applicability. Secondly, the understanding of mid-micro consumers remains narrow as most respondents fall into a small age band, meaning the research may not be indicative of the behaviors of older or alternative consumer groups. Third, the study applied a cross-sectional survey design, therefore causal relationships cannot be definitively established. Fourthly, the self-reported data may cause some response bias. Finally, the use of data screening checks means potential straight-lining responses should be considered in any interpretation of the findings. Accordingly, the results may not be extrapolated indiscriminately to the whole consumer population, namely for female consumers, older consumers, and consumers with varying amounts of online shopping experience.

Scope for Future Study

Implications for future research: Future research can temper this study by testing the model on a larger and more heterogeneous sample. The latter would mean better gender balance and a wider breadth of ages to test if these same relationships are seen across different consumer groups.

In future research, several types of product categories can also be compared. Findings reveal that consumers might react in contrasting manners to sustainability orders for foods, fashion, electronics, personal care, or household products. Recommendation fit and environmental credibility for recommendations may be influenced thereafter by price level and/or product involvement (Satinet et al., 2025).

Another way that could help you is that you can analyze the real purchase behavior. The present study more closely relates to purchase intention, but future research might use transaction data (across existing large datasets/databases), experimental shopping tasks, or field data to obtain stronger evidence of consumer behavior in this area (Hair & Alamer, 2022).

Future research could also investigate whether the use of different formats in which sustainable concrete solutions are presented. As an example, researchers can study whether text explanations, visual labels, comparison charts, or customized sustainability messages lead to more trust and higher purchase intention(Guttmann & Ge, 2024).

Consumers may not accept the recommendation if environmental information seems ambiguous, exaggerated or unsupported (Isac et al., 2025). Similarly, even a well explained recommendation will not generate purchase intention if the product does not suit consumer preferences or if the sustainability claims do not appear credible (Satinet et al., 2025).

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Appendix-A

The final survey instrument included four demographic profile questions and twenty-two model indicators measured on a five-point Likert scale.

Appendix Table A: Questionnaire

Code	Construct	Measurement statement
AGE	Profile	What is your age group?
GENDER	Profile	What is your gender?
OSF	Profile	How often do you shop online?
SK	Profile	How much do you know about environmental and sustainability issues?
PRE1	PRE	The reason for the recommended product was clear.
PRE2	PRE	The way personal preferences influenced the recommendation was understandable.
PRE3	PRE	The platform showed relevant recommendation factors such as price, ratings, sustainability, and eco-labels.
PRE4	PRE	The explanation or information around the recommendation was easy to understand.
EPF1	EPF	The recommended eco-friendly product matched usual product preferences such as price, quality, brand, or product type.
EPF2	EPF	The platform understood the respondent's eco-friendly interests.
EPF3	EPF	The product matched the respondent's specific sustainability interests.
EPF4	EPF	Personalization made the recommendation a better suggestion.
EPF5	EPF	Personalization made the eco-friendly product recommendation more relevant to the respondent's needs.

Code	Construct	Measurement statement
ECC1	ECC	The environmental information provided by the platform was accurate and truthful.
ECC2	ECC	The platform provided enough detail about the product's environmental impact.
ECC3	ECC	The platform supported its sustainability claims with credible sources, certifications, or eco-labels.
ECC4	ECC	The environmental information was supported by straightforward signs such as eco-labels, certification marks, or sustainability claims that were understandable.
ECC5	ECC	The sustainability information seemed genuine and honest rather than like greenwashing.
TRA1	TRA	The platform gave reliable and dependable recommendations.
TRA2	TRA	The platform seemed knowledgeable about sustainable products.
TRA3	TRA	The platform's recommendations supported the respondents' best interest in choosing sustainable products.
TRA4	TRA	The respondents felt confident using the platform's recommendations when shopping.
EPI1	EPI	The respondent would buy the eco-friendly product recommended by the platform.
EPI2	EPI	The respondent would be likely to buy another sustainable product recommended by the platform in the future.
EPI3	EPI	The respondent would choose the recommended eco-friendly product over a regular alternative.
EPI4	EPI	The eco-friendly nature of the product increased the respondent's willingness to buy it.