International Journal of Management, Economics and Commerce
International, Peer Reviewed journal
E-ISSN: **2584-2609**

# EXPLORING THE ROLE OF CHATBOT INTERACTION AND TRUST IN AI TECHNOLOGY IN INFLUENCING ECO-FRIENDLY BEHAVIOUR AMONG CONSUMERS

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***Abstract***

*This research investigates how interactions with chatbots influence environmentally responsible behaviour, with a particular focus on the moderating effect of trust in AI and chatbot technologies. As chatbots increasingly play a role in promoting sustainability and influencing consumer choices, it becomes important to assess their effectiveness in driving eco-conscious actions. The proposed framework suggests that chatbot engagement has a positive impact on eco-friendly behaviour; however, this effect is significantly shaped by the level of trust users have in such technologies. Trust acts as a pivotal moderator, either strengthening or weakening the influence of chatbot interactions on user behaviour. This study contributes to the expanding domain of digital environmental communication by shedding light on the psychological and technological elements that impact sustainable behaviour in the digital era. The research follows a descriptive approach, utilizing a structured questionnaire and convenience sampling to collect data from participants across Kerala.*

***Keywords:*** *Trust I AI, Chatbot Technology, Sustainability, Eco- friendly Behaviour, Digital Environment, Moderation Analysis, Haye's PROCESS*

## INTRODUCTION

The advancement of artificial intelligence (AI) technologies has reshaped numerous industries, particularly in customer engagement and sustainability efforts. Chatbots, a key application of AI, are increasingly being integrated into various sectors to enhance user experience, streamline processes, and promote positive behaviours. Among the diverse ways AI is being leveraged, the promotion of eco-friendly behaviour through AI-driven chatbots has garnered attention as a potential catalyst for sustainable consumption. This study focuses on the role of Trust in AI/chatbot technology and its impact on moderating the relationship between chatbot interaction and consumer eco-friendly behaviour. Specifically, it examines how engaging with chatbots can influence consumers' willingness to adopt eco-friendly practices, while also considering the moderating role of trust in AI systems. As digital technology becomes an intrinsic part of everyday life, understanding its influence on consumer behaviour, especially in the context of sustainability, is of utmost importance for both researchers and practitioners. By investigating the dynamics between chatbot interaction, trust in AI, and eco-friendly behaviour, this study offers valuable insights into how technological advancements can drive positive environmental outcomes.

This study aims to bridge the gap in research regarding the influence of chatbot interactions on sustainability behaviours, focusing on consumers in Kerala, India. The data collected from a diverse sample allows for an in-depth analysis of various factors that contribute to the adoption of sustainable practices, with a particular emphasis on demographic characteristics such as gender. The findings from this study provide practical implications for AI developers, marketers, and sustainability advocates looking to utilize AI technologies to promote environmentally conscious behaviours. The study also aims to enrich the body of knowledge surrounding the intersection of AI, consumer behaviour, and environmental sustainability, offering a framework for future research in this area.

*1.1 Objectives of the Study*

1. To assess the role of chatbot interaction in influencing consumer eco-friendly behaviour, with a focus on how effective AI-driven communication can promote sustainability practices among consumers.
2. To examine the moderating effect of trust in AI/chatbot technology on the relationship between chatbot interaction and eco-friendly behaviour, highlighting how varying levels of trust impact consumers' willingness to adopt sustainable practices.

3. To analyze the demographic factors, such as gender, that may influence the level of engagement with chatbots and the adoption of eco-friendly behaviour, providing insights into how AI technologies can be tailored to different consumer segments.

*1.2 Scope of the Study*

This study primarily focuses on consumers in Kerala, India, providing a localized perspective on the role of AI-driven chatbots in promoting eco-friendly behaviour. The sample includes individuals from various age groups and both genders, allowing for a broad understanding of how different demographic factors influence the adoption of sustainability practices. The scope of the study encompasses the examination of three key constructs: chatbot interaction, eco-friendly behaviour, and trust in AI/chatbot technology. Additionally, the study explores the relationships between these variables and the potential moderating effect of trust, offering insights into how AI technologies can be optimized to encourage sustainable behaviours. The findings are intended to be applicable to AI developers, marketers, and policymakers looking to leverage technology for environmental advocacy, with potential applications beyond the specific geographical region of Kerala.

*1.3 Conceptual model and Theory*

This research paper used the model shown in Fig 1. The model represents a relationship between three variables: Chatbot Interaction (Independent Variable), Eco-Friendly Behaviour (Dependent Variable), and Trust in AI/Chatbot Technology (Moderator Variable).

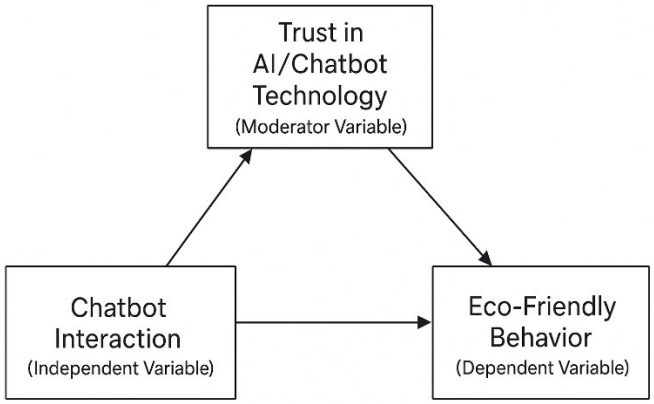


Fig 1: Conceptual Model

The Technology Acceptance Model (TAM), developed by Davis (1989), suggests that two key factors—perceived ease of use and perceived usefulness—play a critical role in determining the acceptance of new technology. According to this model, Chatbot Interaction aligns with the concept of perceived ease of use. If users find a chatbot easy to interact with, they are more likely to engage with it and consequently, this interaction can positively influence their behaviour towards adopting eco-friendly practices. The simpler and more intuitive the interaction, the more likely the user will feel motivated to follow sustainable behaviours suggested by the chatbot.

On the other hand, Trust in AI/Chatbot Technology corresponds with the perceived usefulness construct in TAM. Users who trust the technology are more likely to believe that the AI provides reliable, relevant, and accurate information. In the context of eco-friendly behaviour, if users trust that the chatbot offers valid advice on sustainability, they are more likely to act upon these recommendations. Trust enhances the belief that the technology can meaningfully impact their decision-making, particularly in adopting environmentally responsible actions.

Finally, Eco-Friendly Behaviour serves as the desired outcome in this model. The more users interact with chatbots that are both easy to use and trustworthy, the more likely they are to integrate eco-friendly behaviours into their daily lives. Therefore, the technology's ability to be perceived as useful and easy to engage with directly influences the likelihood of consumers adopting sustainable practices, thereby promoting a more eco-conscious lifestyle.

## LITERATURE REVIEW

It has become necessary worldwide to try new ways to motivate people to act more environmentally friendly. Meanwhile, advances in artificial intelligence (AI) have made it possible for chatbots to step in as agents that allow users to interact in semi-real time. AI chatbots are now used for more than traditional support and they often encourage people to follow eco-friendly habits. This literature review investigates how chatbot interaction influences people to adopt eco-friendly habits, by examining chatbot interaction as the main factor, eco-friendly behaviour as the result and the level of trust people have in chatbots as a mediating factor.

Conversational AI in chatbots helps people adopt eco-friendly habits by offering useful advice. They can guide users to act more environmentally friendly by involving them and giving them the skills to solve problems.

*2.1 Chatbot Interaction*

Chatbots—software systems designed to simulate human conversation—have been extensively adopted across diverse sectors due to their ability to deliver personalized and scalable user engagement. Chatbots can tailor interactions based on user preferences, enhancing the likelihood of adopting sustainable behaviours. For instance, anthropomorphic chatbots in hotels have been shown to positively influence guests' willingness to engage in eco-friendly practices through enjoyable experiences(Singh & Kunja, 2025). The ability of chatbots to provide solutions to environmental issues significantly impacts users' pro-environmental attitudes and their willingness to invest in sustainability efforts(Chi, 2024).

Chatbots can facilitate the spillover of pro-environmental behaviours from specific contexts, such as tourism, into daily life, thereby fostering a broader culture of sustainability(Majid et al., 2024). Chatbot interactions, like those facilitated by KlimaKarl, serve to sensitize employees to climate-conscious behaviours in everyday office life, effectively promoting eco-friendly practices by engaging users and encouraging behavioural change through digital technology in corporate sustainability efforts (Hillebrand & Johannsen, 2021).

*2.2 Eco-Friendly Behaviour*

AI chatbots have been effectively used to promote energy-saving behaviours. For instance, EnergyChat, an AI-powered chatbot, provides personalized energy consumption advice to UK households, achieving high accuracy in intent recognition and entity extraction (Kanayo et al., 2024). Similarly, proactive virtual assistants integrated into smart home ecosystems have been shown to increase energy-saving behaviours by 16% through follow-up conversations and nudging (He et al., n.d.). Chatbots are being utilized to improve waste management and recycling practices. A study in Lima demonstrated that a virtual assistant increased participants' knowledge about recycling by 70.49%, leading to improved recycling habits (Flores et al., 2022). Another study proposed a multi-agent RAG chatbot architecture for decision support in net-zero emission energy systems, highlighting the potential of chatbots in managing complex environmental data (Gamage et al., 2024).

*2.3 Trust in AI Chatbot*

Trust in AI chatbots plays a crucial role in moderating the relationship between chatbot interaction and eco-friendly behavior. Trust can enhance the effectiveness of chatbots in promoting pro-environmental attitudes and behaviors by influencing user engagement and willingness to act on the chatbot's suggestions. This relationship is particularly significant in contexts where chatbots are used to encourage sustainable practices, such as in environmental education or corporate settings. The following sections explore how trust impacts this dynamic.

Trust in AI chatbots can enhance users' pro-environmental attitudes by increasing their willingness to engage with the chatbot's content and suggestions. When users trust the chatbot, they are more likely to perceive its information as credible and valuable, which can lead to a greater willingness to adopt eco-friendly behaviours(Chi, 2024). In educational settings, trust in chatbots can support identity development and well-being, which are essential for fostering a connection to environmental sustainability. This trust can be built through value-sensitive design, which aligns chatbot interactions with users' values and ethical considerations(Nguyen et al., 2025). User trust in chatbots is influenced by several factors, including transparency, accountability, and the perceived reliability of the chatbot's responses. Understanding these factors is essential for designing chatbots that effectively promote eco-friendly behavior. Trust metrics and user experiences are critical in assessing and enhancing trust in AI systems(Hans et al., 2024).

*2.4 Theoretical Review*

The Theory of Planned Behaviour (TPB) (Ajzen, 1991) offers a robust theoretical foundation for interpreting how chatbot interactions influence eco-friendly behaviour. TPB posits that behavioural intentions are the immediate antecedents of behaviour, shaped by attitudes, subjective norms, and perceived behavioural control. Chatbots can positively influence these determinants by providing informative content that enhances favourable attitudes, reinforcing social norms around sustainability, and increasing perceived control through actionable recommendations.

Complementarily, Trust Theory (Mayer et al., 1995) elucidates the mechanisms through which trust impacts user engagement with AI systems. The triadic trust dimensions—ability, benevolence, and integrity—offer a nuanced understanding of how users evaluate chatbot credibility and subsequently adopt its behavioural guidance.

Together, these theoretical frameworks facilitate a comprehensive understanding of the dynamic interplay between chatbot interaction, trust, and eco-friendly behaviour.

The reviewed literature affirms that chatbot interaction represents a promising vector for promoting eco-friendly behaviour through personalized, timely, and engaging sustainability communication. The efficacy of such interventions is substantially influenced by user trust in AI chatbots, which acts as a critical moderator enhancing receptivity and behavioural compliance. Integrating the Theory of Planned Behavior and Trust Theory provides a coherent conceptual model for understanding these relationships.

Future research should prioritize the development of trust-enhancing chatbot designs incorporating ethical AI principles and contextual personalization. Investigating additional moderating factors, such as demographic and psychographic characteristics, will further elucidate user heterogeneity in behavioural responses. Advancements in this domain hold significant promise for leveraging AI chatbots as scalable agents of sustainable behaviour change, thereby contributing to broader environmental

objectives.

## RESEARCH METHODOLOGY

a. **Research Design:** Current research used a descriptive research design, which was focused on investigating the demographics and impact of Chatbot interactions and the influence of them on Eco-friendly behaviour while examining the role of trust in AI/Chatbot technology on this relationship. A structured questionnaire was implemented with a descriptive research design. The respondents were from different parts of Kerala.

b. **Sampling Method:** Based on the research design, convenience sampling was used in this study.

c. **Sample Size:** The questionnaire generated 242 respondents from different parts of the State of Kerala, India.

d. **Data Collection Method:** The research used a structured questionnaire in Print and Google Forms. Demographic data of the target population were collected in the survey. The second part was investigating the chatbot interactions, trust in AI/Chatbot technology, and influence on Eco-friendly behaviour.

e**. Techniques used:** Demographic analysis was done to measure the characteristics of the target population. Descriptive statistics generate a general picture of the sample characteristics. Chi-square test was used to investigate the gender wise influence on the constructs of the study- chatbot interactions, trust in AI/Chatbot technology, and influence on Eco-friendly behaviour. Multiple Correlation was used to find the strength of the relationship between the variables. Moderation analysis was tested using the PROCESS macro using Hayes' procedure between the variables. IBM SPSS v.23 was used for the analysis.

## RESULTS AND DISCUSSION

The study was focused on the role of Trust in AI/chatbot technology in moderating the relationship between Chatbot interaction and its influence on Eco-Friendly behaviour among consumers. The data was collected through a questionnaire from the samples across Kerala.

*4.1 Demographic characteristics and general survey*

**Table 1 : Demographic characteristics**

| Characteristics | Percentage of Respondents (%) |
|---|---|
| **Age Group(Years)** | |
| 25-29 | 28 |
| 30-34 | 30.8 |
| 35-39 | 14.9 |
| 39-43 | 13 |
| 44-48 | 11.5 |
| Above 49 years | 2.9 |
| **"Gender"** | |
| Male | 68.6 |
| Female | 31.4 |

***Note:*** Sample size, n = 242

The demographic characteristics of the respondents revealed a distribution of age groups, with the highest percentage of participants falling in the 30-34 years age group (30.8%). The 25-29 years group followed closely at 28%, while smaller proportions were observed in the 35-39 years (14.9%), 39-43 years (13%), 44-48 years (11.5%), and above 49 years (2.9%) categories. These age groups reflect a broad spectrum of consumer perspectives on AI/Chatbot technology and eco-friendly behaviour.

Regarding gender distribution, a majority of the respondents were male (68.6%), while female participants made up 31.4%. This gender distribution may influence the generalizability of the findings, as different gender groups may interact with AI/chatbot technology and perceive eco-friendly behaviour differently.

*4.2 Descriptive Analysis:*

Descriptive statistics were computed for the three primary variables of interest: Chatbot Interaction, Eco-Friendly Behaviour, and Trust in AI/Chatbot Technology. The results are presented below.

**Table 2: Descriptive Statistics**

| Variable | Statement | N | M | SD |
|---|---|---|---|---|
| *Chatbot Interaction* | The chatbot provided useful information on eco-friendly practices. | 242 | 3.93 | 0.628 |
| | The chatbot was easy to interact with. | 242 | 4.02 | 0.561 |

| | | | | |
|---|---|---|---|---|
| | The chatbot personalized suggestions based on my preferences. | 242 | 3.77 | 0.918 |
| | I felt encouraged by the chatbot to consider eco-friendly alternatives. | 242 | 3.64 | 0.629 |
| | The chatbot made learning about sustainability engaging. | 242 | 3.87 | 0.669 |
| *Eco-Friendly Behaviour* | I recycle plastic, paper, or metal items. | 242 | 4.12 | 0.701 |
| | I prefer buying eco-friendly or biodegradable products. | 242 | 4.29 | 0.767 |
| | I reduce electricity/water usage to conserve resources. | 242 | 3.88 | 0.879 |
| | I avoid single-use plastics whenever possible. | 242 | 4.12 | 0.598 |
| | I share or promote sustainable practices with others. | 242 | 4.11 | 0.715 |
| *Trust in AI/Chatbot Technology* | I trust AI-based systems to provide accurate information. | 242 | 3.5 | 0.846 |
| | I am comfortable taking advice from chatbots. | 242 | 3.95 | 0.843 |
| | I believe chatbots can influence sustainable decision-making. | 242 | 3.73 | 0.729 |
| | I find chatbot responses to be reliable and credible. | 242 | 3.72 | 0.931 |

***Note:*** Sample size, n=242

*Chatbot Interaction:*

The overall responses related to **Chatbot Interaction** indicated that the chatbot was generally perceived positively by the participants. The statement "The chatbot was easy to interact with" had the highest mean (M = 4.02), suggesting that users found it user-friendly. The lowest mean score was for "The chatbot personalized suggestions based on my preferences" (M = 3.77), which may indicate room for improvement in personalizing chatbot interactions. The standard deviations for the responses were relatively low across all statements, with the highest being 0.918 for personalization, indicating some variation in responses for this statement.

*Eco-Friendly Behaviour:*

Participants also demonstrated generally strong eco-friendly behaviours. The statement "I prefer buying eco-friendly or biodegradable products" received the highest mean (M = 4.29), indicating a preference for sustainable products. The statement "I reduce electricity/water usage to conserve resources" had a lower mean (M = 3.88), suggesting that while participants are conscious of resource conservation, it may not be as strongly practiced compared to other behaviours. The variability in responses was moderate across the statements, with the highest standard deviation of 0.879 for reducing electricity/water usage, indicating that this practice may vary more significantly across individuals.

*Trust in AI/Chatbot Technology:*

Regarding **Trust in AI/Chatbot Technology**, the responses showed moderate trust in AI-based systems. The statement "I am comfortable taking advice from chatbots" had the highest mean (M = 3.95), suggesting a relatively high level of comfort with chatbot advice. The lowest mean was for "I trust AI-based systems to provide accurate information" (M = 3.50), which reflects a moderate level of trust in the accuracy of AI-generated information. The standard deviations ranged from 0.729 to 0.931, showing a relatively high degree of variation in trust levels across participants.

These results suggest that while participants generally interact positively with chatbots, there is more room for improvement in enhancing personalization features and increasing trust in AI-generated information. The data also highlights varying degrees of commitment to eco-friendly behaviour, which could be influenced by individual differences or external factors.

***4.3 Chi-Square Test:*** *Gender Vs the Three Constructs*: Chatbot Interaction, Eco-Friendly Behaviour, and Trust in AI/Chatbot Technology

A Chi-Square Test was conducted to determine whether there is a significant relationship between Gender and the three constructs: Chatbot Interaction, Eco-Friendly Behaviour, and Trust in AI/Chatbot Technology. The results are summarized as follows:

***Hypothesis***

***1.*** **Chatbot Interaction and Gender**

- ***Null Hypothesis ($H_0$):*** *There is no significant relationship between* ***Gender*** *and* ***Chatbot Interaction****.*
- ***Alternative Hypothesis ($H_1$):*** *There is a significant relationship between* ***Gender*** *and* ***Chatbot Interaction****.*

***2.*** **Eco-Friendly Behaviour and Gender**

- ***Null Hypothesis ($H_0$):*** *There is no significant relationship between* ***Gender*** *and* ***Eco-Friendly Behaviour****.*
- ***Alternative Hypothesis ($H_1$):*** *There is a significant relationship between* ***Gender*** *and* ***Eco-Friendly Behaviour****.*

***3*. Trust in AI/Chatbot Technology and Gender**

- ***Null Hypothesis ($H_0$):*** *There is no significant relationship between* ***Gender*** *and* ***Trust in AI/Chatbot Technology****.*
- ***Alternative Hypothesis ($H_1$):*** *There is a significant relationship between* ***Gender*** *and* ***Trust in AI/Chatbot Technology****.*

**Table 3: Crosstab**

| | | Chatbot Interaction | | | Total |
|---|---|---|---|---|---|
| | | 15-18 | 19-21 | >21 | |
| Gender | Female | 40 | 30 | 6 | 76 |
| | Male | 52 | 94 | 20 | 166 |
| Total | | 92 | 130 | 20 | 242 |

**Table 4: Crosstab**

| | | Eco-Friendly Behaviour | | | Total |
|---|---|---|---|---|---|
| | | 15-18 | 19-21 | >21 | |
| Gender | Female | 20 | 6 | 50 | 76 |
| | Male | 46 | 60 | 60 | 166 |
| Total | | 66 | 60 | 116 | 242 |

**Table 5: Crosstab**

| | | Trust in AI/Chatbot Technology | | | Total |
|---|---|---|---|---|---|
| | | 11 to 13 | 14-15 | >15 | |
| Gender | Female | 20 | 36 | 20 | 76 |
| | Male | 72 | 34 | 60 | 166 |
| Total | | 92 | 70 | 80 | 242 |

**Table 6 : Summary of Chi-Square Test for Gender Vs Chatbot Interaction, Influence on Eco-friendly behaviour and Trust in AI/Chatbot technology**

| Demographic Variables | Construct | Chi-Square Value | df | p | Significant or not significant |
|---|---|---|---|---|---|
| Gender | 1. Chatbot Interaction | 56.318 | 2 | <.05 | Significant |
| Gender | 2. Eco-Friendly Behaviour | 97.581 | 2 | <.05 | Significant |
| Gender | 3. Trust in AI/Chatbot Technology | 95.862 | 2 | <.05 | Significant |

***Note:*** Sample size, n=242. df denotes the degree of freedom, and p denotes the p-value.

The Chi-Square value for the relationship between Gender and Chatbot Interaction was 56.318, with 2 degrees of freedom. The p-value is less than 0.05 ($p < 0.05$), indicating that the relationship is statistically significant. This suggests that gender has a significant effect on the level of interaction with the chatbot, with male participants showing a higher engagement across the interaction categories compared to female participants.

The Chi-Square value for Gender and Eco-Friendly Behaviour was 97.581, with 2 degrees of freedom. The p-value is again less

than 0.05 ($p < 0.05$), indicating that the relationship between gender and eco-friendly behaviour is statistically significant. Males tend to have higher engagement in eco-friendly behaviour than females, especially in the category of behaviours associated with reducing resource usage and promoting sustainability.
The Chi-Square value for Gender and Trust in AI/Chatbot Technology was 95.862, with 2 degrees of freedom. The p-value is less than 0.05 ($p < 0.05$), indicating that gender also has a statistically significant relationship with the trust in AI/chatbot technology. Males showed higher levels of trust in AI and chatbots compared to females, reflecting differing perceptions of technology between the genders.

**4.4 Multiple Correlation:** *Trust in Chatbot/AI, Chatbot Interaction and Influence on Eco-friendly Behaviour of consumers*

**Table 7 : Correlation test between Trust in Chatbot/AI, Chatbot Interaction and Influence on Eco-friendly Behaviour of consumers**

| Variables | n | M | SD | 1 | 2 | 3 |
|---|---|---|---|---|---|---|
| 1. Chatbot Interaction | 242 | 19.23 | 2.63 | 1 | .442** | .842** |
| 2. Eco-Friendly Behaviour | 242 | 20.52 | 2.82 | .442** | 1 | .317** |
| 3. Trust in AI/Chatbot Technology | 242 | 14.89 | 2.85 | .842** | .317** | 1 |

***Note:*** M stands for Mean and SD for standard deviation, respectively. n represents the number of valid cases. The mean for Chatbot Interaction was 19.23 with a standard deviation of 2.63, while Eco-friendly behaviour had a mean value of 20.52 with a standard deviation of 2.82. Trust in AI/Chat technology had a mean and standard deviation of 14.89 and 2.85, respectively. **indicate p<.05.

The relationship between Trust in Chatbot/AI, Chatbot Interaction, and Eco-friendly Behaviour of consumers was analyzed using correlation coefficients. The results are presented in Table 5.
A moderate positive correlation was found between Chatbot Interaction and Trust in AI/Chatbot Technology ($r = 0.842$, $p < 0.05$), indicating that as participants interacted more with chatbots, their trust in AI/chatbot technology increased. This suggests that higher engagement with chatbots is associated with greater trust in the technology's accuracy and functionality.

**4.5 Moderation Analysis:** *Trust in CHATBOT/AI moderated the relationship between Chatbot Interaction and its influence on Eco-friendly Behaviour among consumers*

A moderation analysis using Hayes' Process Model 1 was conducted to examine whether Trust in AI/Chatbot Technology moderates the relationship between Chatbot Interaction and its influence on Eco-friendly Behaviour among consumers. The results of the analysis are presented in the table below.

**Table 8 : Results of Hayes' Process Model 1 Moderation analysis using MATRIX Procedure**

| Variable | B | SE | t | p | %CI |
|---|---|---|---|---|---|
| Intercept | 21.7636 | 0.1761 | 123.62 | 0.0000 | [21.4168, 22.1104] |
| Chatbot Interaction | 0.5629 | 0.094 | 5.9856 | 0.0000 | [0.3776, 0.7481] |
| Trust in AI/Chatbot Technology | 0.1319 | 0.0918 | 1.4371 | 0.1520 | [ -.0489, .3127] |
| Chatbot Interaction*Trust in AI/Chatbot Technology | -0.1976 | 0.0183 | -10.7854 | 0.0000 | [ -.2337,-.1615] |

***Note*:** This table presents the results of a Hayes Process Model 1 moderation analysis using MATRIX procedure. The dependent variable is the influence on Eco-friendly behaviour among consumers, and the independent variable is Chatbot Interaction. It was found that the interaction between chatbot interaction and trust in AI/Chatbot technology was significant, indicating that the relationship between the dependent and independent variables was moderated by Trust in AI/Chatbot technology.

**Table 9: Conditional Effects of Trust in AI/Chatbot Technology on Chatbot Interaction**

| Trust in AI/Chatbot Technology | Effect(ß) | SE | t | p | LLCI | ULCI |
|---|---|---|---|---|---|---|
| -2.8454 | 1.1252 | 0.1038 | 10.8355 | 0.000 | 0.9206 | 1.3298 |
| 0.000 | 0.5629 | 0.094 | 5.9856 | 0.000 | 0.3776 | 0.7481 |
| 2.8454 | 0.0005 | 0.1111 | 0.0048 | 0.996 | -0.2183 | 0.2194 |

***Note:*** $p<0.05$

The results of the conditional effects analysis showed that at lower levels of trust (Trust = -2.8454), the effect of Chatbot Interaction on Eco-friendly Behaviour was significantly positive (B = 1.1252, $p < 0.05$), indicating that lower trust in AI chatbots led to a stronger relationship with eco-friendly behaviour. At the average level of trust (Trust = 0.000), the effect remained positive but weaker (B = 0.5629, $p < 0.05$). However, at higher levels of trust (Trust = 2.8454), the effect was negligible (B = 0.0005, p = 0.996), suggesting that greater trust in chatbots diminishes the impact of chatbot interaction on eco-friendly behaviour.

**Table 10: Conditional Effect of Focal Predictor at Values of the Moderator**

| Trust | Effect | se | t | p | LLCI | ULCI |
|---|---|---|---|---|---|---|
| -3.8926 | 1.3322 | 0.1134 | 11.7442 | 0 | 1.1087 | 1.5556 |
| -3.4189 | 1.2385 | 0.1088 | 11.3857 | 0 | 1.0242 | 1.4528 |
| -2.9452 | 1.1449 | 0.1046 | 10.9411 | 0 | 0.9388 | 1.3511 |
| -2.4715 | 1.0513 | 0.1011 | 10.4002 | 0 | 0.8522 | 1.2504 |
| -1.9978 | 0.9577 | 0.0982 | 9.7556 | 0 | 0.7643 | 1.1511 |
| -1.5241 | 0.8641 | 0.0959 | 9.0056 | 0 | 0.6751 | 1.0531 |
| -1.0505 | 0.7705 | 0.0945 | 8.1549 | 0 | 0.5843 | 0.9566 |
| -0.5768 | 0.6769 | 0.0938 | 7.2165 | 0 | 0.4921 | 0.8616 |
| -0.1031 | 0.5832 | 0.0939 | 6.2109 | 0 | 0.3982 | 0.7682 |
| 0.3706 | 0.4896 | 0.0948 | 5.1639 | 0 | 0.3028 | 0.6764 |
| 0.8443 | 0.396 | 0.0965 | 4.1036 | 0.0001 | 0.2059 | 0.5861 |
| 1.318 | 0.3024 | 0.0989 | 3.0568 | 0.0025 | 0.1075 | 0.4973 |
| 1.7916 | 0.2088 | 0.102 | 2.0463 | 0.0418 | 0.0078 | 0.4098 |
| 1.8284 | 0.2015 | 0.1023 | 1.97 | 0.05 | 0 | 0.4031 |
| 2.2653 | 0.1152 | 0.1058 | 1.089 | 0.2773 | -0.0932 | 0.3235 |
| 2.739 | 0.0216 | 0.11 | 0.1959 | 0.8448 | -0.1952 | 0.2384 |
| 3.2127 | -0.0721 | 0.1148 | -0.6275 | 0.531 | -0.2983 | 0.1542 |
| 3.6864 | -0.1657 | 0.1201 | -1.3799 | 0.1689 | -0.4022 | 0.0708 |
| 4.0925 | -0.2459 | 0.1248 | -1.97 | 0.05 | -0.4919 | 0 |
| 4.1601 | -0.2593 | 0.1257 | -2.0633 | 0.0402 | -0.5068 | -0.0117 |
| 4.6338 | -0.3529 | 0.1316 | -2.6815 | 0.0078 | -0.6121 | -0.0936 |
| 5.1074 | -0.4465 | 0.1378 | -3.2395 | 0.0014 | -0.718 | -0.175 |

These results suggest that Trust in AI/Chatbot Technology significantly moderates the relationship between Chatbot Interaction

and Eco-friendly Behaviour, with lower trust levels leading to a stronger positive effect, while higher trust levels reduce the impact of chatbot interaction on eco-friendly behaviours.

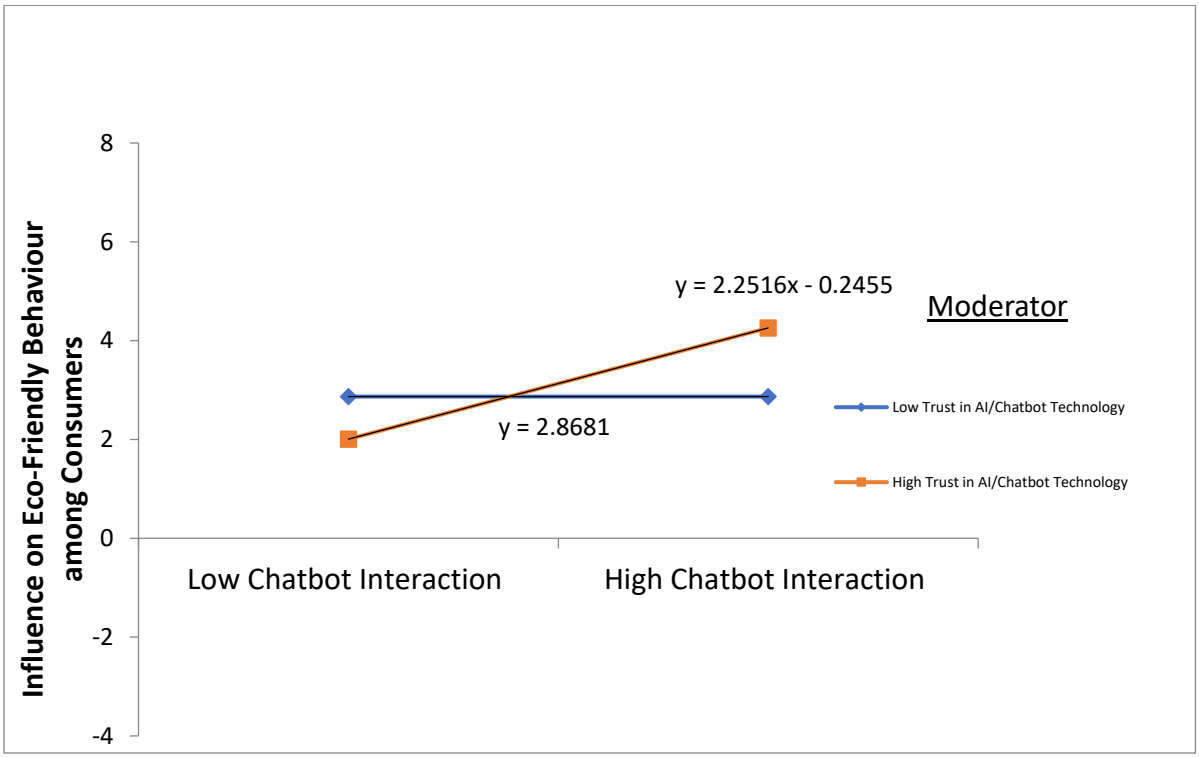


**Fig 2 : Trust in AI/Chatbot Technology strengthens the positive relationship between chatbot interaction and influence on Eco-Friendly behaviour**

*Source:* Gaskin, J. (2016), "2-way interactions", Stats Tools Package. http://statwiki.gaskination.com

The figure illustrates the influence of trust in AI/chatbot technology and chatbot interaction levels on eco-friendly behaviour among consumers. The figure highlights the moderating role of chatbot interaction, indicating that higher interaction levels may further amplify this relationship. These findings underscore the potential of AI-driven chatbots to promote sustainable consumer behaviour, particularly among individuals with greater trust and engagement with the technology.

## DISCUSSION

This study explores the relationship between chatbot interaction, trust in AI/chatbots, and eco-friendly behaviour among consumers in Kerala. The demographic analysis shows that the majority of participants are young adults, especially between 25 to 34 years, with more male respondents. This likely impacted patterns in chatbot use and views on sustainability.

Participants generally had positive experiences with chatbot interactions, finding them easy to use and helpful in promoting eco-friendly practices. However, the lower ratings for personalization highlight an area for improvement. Tailoring chatbot responses to individual preferences could increase engagement and better influence behaviour changes.

The eco-friendly behaviour metrics showed that participants actively engaged in sustainable practices, especially in reducing plastic use and opting for biodegradable products. This suggests a rising environmental awareness, which chatbots and AI tools could further support. According to literature, eco-friendly products not only mitigate environmental harm but also resonate with evolving consumer behaviour, where individuals increasingly prioritize sustainability in their purchasing decisions (Ghouse et al., 2024). Eco-friendly products significantly reduce environmental harm by promoting sustainable resource use and minimizing pollution (Smith, 2023). Their adoption empowers consumers to make responsible choices that contribute to a greener future.

Regarding trust in AI/chatbots, the study found moderate trust levels. Participants were more comfortable accepting advice from chatbots than trusting the accuracy of the information. This indicates that while users are open to AI guidance, concerns about the reliability of information limit its widespread adoption.

The chi-square tests revealed that gender plays a significant role in all aspects, with males showing higher engagement with chatbots, stronger eco-conscious behaviours, and greater trust in AI. This indicates that gender influences both technological adoption and sustainability attitudes, suggesting the need for tailored strategies in chatbot design and communication. Some studies showed that men are more likely to use generative AI chatbots for diverse tasks, including coding and productivity, while

women show greater concern for ethical implications and prefer text-based interactions (Møgelvang et al., 2024). These gendered patterns suggest that AI adoption is shaped not just by utility but also by social and psychological factors (Møgelvang et al., 2024).

Correlation analysis showed strong links between chatbot interaction and trust, and a moderate relationship with eco-friendly behaviour, supporting the idea that chatbot engagement builds trust and can encourage sustainable actions. Previous literature sights that AI chatbot functionalities positively influence customer green satisfaction, which in turn enhances green loyalty, with pro-environmental behaviour mediating this relationship (Nguyen et al., 2025).

A key finding from the moderation analysis is that trust in AI significantly impacts how chatbot interaction influences eco-friendly behaviour. At lower trust levels, chatbot interaction had a stronger effect on behaviour, while higher trust levels led to a weaker effect. This suggests that consumers with low trust may rely more on chatbots for behavioural change, while those with higher trust may already be aligned with sustainability. Similar literature showed how chatbot traits influence user confidence, acceptability, and engagement, finding that perceived ease of use, performance expectations, and social influence significantly enhance initial trust in chatbots, which in turn affects usage intention, loyalty, and customer engagement (M et al., 2024).

Overall, the study highlights the importance of improving chatbot functionality, trust-building, and personalization to encourage eco-friendly practices. These insights are beneficial for AI developers, marketers, and sustainability advocates looking to leverage chatbots for behavioural change.

## CONCLUSION

The study reveals that Trust in AI/Chatbot Technology plays a key moderating role between Chatbot Interaction and Eco-friendly Behaviour. Gender influences all three variables, with males showing higher engagement and trust in AI. A strong positive correlation was observed between Chatbot Interaction and Trust in AI, suggesting that increased interaction builds greater trust. Interestingly, the moderation analysis showed that lower trust levels strengthen the impact of chatbot interaction on eco-friendly behaviour, while higher trust levels reduce this effect. These findings highlight the importance of fostering trust and interaction to promote sustainable behaviour, particularly among consumers with lower trust in AI. AI-driven chatbots have the potential to encourage eco-conscious actions, even among users with varying levels of trust in technology. This offers valuable direction for future research in AI, environmental behaviour, and consumer trust.

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