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Research paper



Transforming Technology Towards Green Mobility: The Mediating Effect of Attitude on Consumers' Purchase Intention

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Abstract

As the world moves towards more sustainable transportation, electric two-wheelers are becoming viable alternatives to traditional vehicles, particularly in developing nations. This research investigates the transforming technology towards green mobility factors influencing consumers' purchase intention with reference to the Vellore district, using Behavioural Science and Technology Adoption theories to identify four key influencing factors: environmental concern, perceived economic benefits, social influence, and charging infrastructure. In this study, a structured questionnaire was used and surveyed, in which 99 respondents were collected, and advanced statistical analysis (PLS-SEM) was conducted. The study's results indicated that economic benefits and social influence had a significant impact on purchase intentions, whereas environmental concerns and charging infrastructure had a minor effect on purchasing decisions. Nonetheless, charging infrastruc-ture influences consumer views towards electric scooters, even if those perceptions may not convert into actual purchase intentions. Accord-ing to the study's findings, economic benefits and social influences outweigh environmental motivations in consumer purchasing decisions in the Vellore district. These findings are useful for governments, manufacturers, and marketers seeking to increase electric vehicle adoption, as they suggest that efforts should be prioritized on economic incentives and infrastructure development over environmental benefits. In addition, the study identifies prospective topics for further managerial and practical implementations of the findings.

Keywords: *Consumer Attitude; Environmental Sustainability; Green Mobility; Green Technology; Transforming Technology; and Purchase Intention.*

1. Introduction

Environmental problems and climate change have been recognized as global issues (Lee, J et al., 2021). Rapid growth in urbanization and a growing population density in cities around the world have created substantial transportation difficulties, such as traffic congestion, air pollution, and rising fuel prices. In response to these concerns, there has been an increasing demand for alternate forms of transportation that are both environmentally friendly and efficient (Khan et al., 2022). The passenger vehicle sector aims to provide innovative, safe, environmentally friendly, and user-friendly transportation options. Electric vehicles, also referred to as battery-operated vehicles or electric scooters, come in several types. E-scooters are a more environmentally friendly way of transportation compared to automobiles that use fossil fuels. This eco-friendly and urban mode of transportation uses a battery as its energy source. Electric scooters offer significant economic and environmental benefits (Nigam et al,2023). Among these alternatives, electric scooters (e-scooters) have emerged as a popular option for urban commuters seeking to manage congestion while reducing their environmental impact. E-scooters provide several advantages, including cheaper operational costs, lower carbon emissions, and the convenience of flexible transportation in urban areas (Zhang Wang, 2024). The electric scooter is an innovative form of private transportation that has modernized urban mobility, particularly in high-population and environmentally conscious countries. The electric scooter's batteries can be recharged using an electric socket. A typical electric scooter requires 6-8 hours to charge and may travel up to 50 km at a speed of 35 km/h (depending on rider weight). E-scooters provide affordable, energy-efficient, and emission-free transportation, as well as physical and health benefits (Nigam et al,2023). Electric vehicles are gaining popularity as an environmentally beneficial alternative to gasoline-powered vehicles due to their zero carbon emissions. Electric two-wheelers are more efficient, emit less pollution, and produce less noise than petrol-powered ones. Further research is needed to determine customer acceptance of electric vehicles, as they are still in their early stages of development. Electric vehicles face several challenges, including high battery costs, restricted driving range, and long recharge times (Jayasingh et al., 2021). Many research articles have been published on customer acceptance of electric and hybrid cars. There are a few studies on the adoption of electric two-wheelers (T Eccarius, CC Lu 2020). Previous studies have focused primarily on the adoption of electric cars, with limited research on

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electric two-wheelers. Electric vehicle acceptance differs based on geography and economic conditions (Taeri et al., 2021). According to recent surveys, the adoption of e-scooters is part of a larger transition towards sustainable mobility methods, rather than a temporary trend. As customers become increasingly conscious of environmental issues, their purchase behaviour is influenced by several elements like as technical improvements, government regulations, and social factors (Lee et al., 2021). Technological advancements have improved the performance, safety, and affordability of e-scooters, making them more appealing to a wide variety of consumers (Wang et al., 2024). Government actions to promote green mobility, such as electric vehicle subsidies and the establishment of dedicated infrastructure, have a significant impact on consumer attitudes towards e-scooter ownership (D Sahoo et al., 2022). Additionally, social influence has a huge impact on customer purchasing intentions. The growth of shared mobility services has normalised e-scooter utilise, allowing people to experience the benefits before committing to ownership (Zhang et al., 2024). This exposure can result in positive perceptions and greater interest in personal purchases. Furthermore, the perceived value of e-scooters, which includes cost-effectiveness, convenience, and environmental impact, has a strong influence on consumer decision-making (Chen et al., 2023). Understanding these elements is critical for manufacturers, marketers, and legislators who want to promote sustainable urban mobility solutions. By investigating the factors that influence consumers' purchasing intentions for electric scooters, stakeholders can devise focused initiatives to improve acceptance and promote wider adoption. The purpose of this study paper is to look at the various aspects that influence consumers' purchasing intention for electric scooters. We intend to identify major consumer behaviour drivers in this emerging market using a detailed literature review and empirical analysis. We expect to gain useful data that will drive future legislation and marketing efforts aimed at promoting electric scooters as an essential component of sustainable urban transportation systems. This research was to create an adoption system for electric two-wheelers. This study examined the literature to identify the elements that influence the decision of individuals to buy electric two-wheelers. The presented model can help develop strategies to accelerate the adoption of electric two-wheelers. The proposed approach may additionally suggest companies for selling electric two-wheelers. Promoting electric vehicles will reduce pollution and decrease the country's dependence on imported oil. This paper used a partial least squares-based structural equation modeling (SEM) approach. The study was conducted with 99 respondents of electric scooter users in the Vellore district. This article's reminder is organised in the following manner. Section 2 summarises the major electric vehicle articles adopted and evaluates them for the literature review. Section 3 gives the conceptual framework for the research, whereas Section 4 presents the research hypothesis. Section 5 presents the data methodology. Section 6 represents data analysis and inference, while Section 7 presents the results for the study, and Section 8 discusses the research's discussion and limitations, as well as directions for further research, and Section 9 presents the conclusion.

2. Literature Review

Electric scooters are a new product with green technology, leading to innovative consumer purchasing intentions (Jayasingh et, al 2021). Electric scooter adoption is one of the widely researched topics at present, and a good number of studies have been done on electric vehicle adoption (Lashari et al., al 2021)

2.1. Environmental concern

Research indicates that consumers who are more concerned about the environment are more inclined to purchase ecologically friendly products, such as electric two-wheelers (Chirag et al, 2021). According to Peters and Dütschke's (2014) research survey in Germany, the environmental benefits of electric vehicles are a key reason for purchasing them. Wang et al.'s (2016) study in China found that environmental concern indirectly influences the desire to use hybrid EVs, with attitude acting as a mediator (Wang et al., al 2016). According to Lai et al.'s (2015) Macau study, environmental concerns drive the adoption of full-electric vehicles. Previous study indicates that environmentally conscious consumers may purchase eco-friendly or green items, such as electric vehicles (Dash, 2020).

2.2. Perceived economic benefits

Perceived benefits of a product can be financial or non-financial (Yang et al., al 2020). Buying electric two-wheelers offers economic benefits such as government subsidies, minimal maintenance expenses, and no fuel prices. Consumers' impression of economic benefits typically influences their product buying decisions. A study by Lai et al. found a strong correlation between perceived economic benefits and intention to purchase complete electric vehicles (Jayasingh et, al 2021). 1. Price, performance, quality, and service have a major impact on user satisfaction, according to Anjana and Paul Rajan's (2025) methodical investigation of customer satisfaction with electric motorcycles in Kerala. In Kerala, where the availability and cost of charging facilities influence user perceptions and adoption behavior, their work is consistent with regional research that demonstrates price and perceived value as crucial factors of satisfaction and purchase intention among electric two-wheeler users.

2.3. Social influence

Social influence refers to the way friends, family members, or competitors could affect a consumer's decisions, such as product selection (Venkatesh et al., 2000). The social influence concept encompasses social pressure, subjective norms, peer influence, and cultural influences. Certain consumers seek social acceptance before purchasing and using a product. They will not purchase things for which they believe there is no social approval. Previous research indicates that social influence plays a significant role in consumers' decisions to purchase electric scooters (Lee, et., al 2021). According to Tu and Yang's (2019) research, subjective norms have a major impact on EV purchasing decisions [41]. According to Khazaei and Tareq's (2021) research in Malaysia, societal acceptance has a significant role in customer adoption of battery electric vehicles (Khazaei, H.; Tareq 2021). As electric two-wheelers are a new technology, social influence may impact individuals' attitudes and intentions towards them.

2.4. Charging infrastructure

Charging infrastructure is often cited as a key factor in electric vehicle uptake (Eccarius, 2020). Consumers are concerned about their EVs running out of juice between charging locations, which is the main cause of this. Tarei et al. (2021) found that infrastructural constraints are the top barrier to EV adoption in India, based on a poll of experts. Charging infrastructure is generally seen as a significant hurdle to purchasing electric automobiles. India has a limited electrical vehicle charging infrastructure, with only 26 EVs per charger. According to

Nair et al.'s (2017) research, poor charging infrastructure is a major impediment to EV adoption in India. Researchers from other nations have identified charging facilities as the main limitation to EV adoption (Tarei et al. 2021). Research indicates that having access to charging infrastructure increases the probability of purchasing electric vehicles.

2.5. Attitude and purchase intention

Asadi et al. (2020) employed the norm activation model and the theory of planned behaviour to analyse the intention to purchase electric vehicles in Malaysia. The study found that perceived value, attitude, consumer effectiveness, subjective standards, and awareness of outcomes all have a substantial impact on customers' intention to embrace electric vehicles. Lashari et al.'s (2021) study in South Korea found that attitudes and beliefs about the environmental and economic benefits of utilising EVs strongly influenced intention to purchase. Wang and Zhou (2016) applied rational choice theory to analyse consumer intentions to buy electric automobiles in China. Their research findings showed the willingness to purchase electric vehicles depends on charging infrastructure, financial incentives, environmental awareness, and social influence (Jayasingh et, al 2021). Behavioural models such as the theory of reasoned action, the theory of planned behaviour, and the technology acceptance model incorporate research on consumer buying intentions and attitudes. Yang et al. (2020) and Wang et al. (2018) found a positive correlation between customer attitudes and the intention to purchase electric vehicles in China. According to Khurana et al. (2019), attitudes have a significant impact on the adoption of electric cars in India. This study suggests that consumer opinions towards electric two-wheelers influence their intention to purchase. 2. Shakya et al. (2025) investigated consumers' behavioral intentions about the adoption of e-bikes in the Kathmandu Valley and found that while awareness of e-bikes is almost ubiquitous, actual readiness to adopt is moderate, with only roughly half of respondents expressing a preference for e-bikes.

2.6. Objectives of the study

1) To understand the factors influencing the consumer's purchasing intention towards electric scooters, with a focus on the mediating role of attitude.
2) To investigate the direct impact of environmental concern, perceived economic advantage, social influence, and charging infrastructure on consumer purchase intentions for electric scooters, while considering attitude as a mediating factor.
3) To determine the importance and strength of each independent factor in shaping attitude and its subsequent effect on purchase intention.

3. Methods and Materials

3.1. Conceptual framework

The researcher developed a proposed conceptual framework for this empirical research, for the consumer purchase intentions towards electric scooters, with the key factors such as environmental concern, perceived economic benefits, social influence, charging Infrastructure, and attitude. The conceptual framework for the study is presented in Figure 1 below.

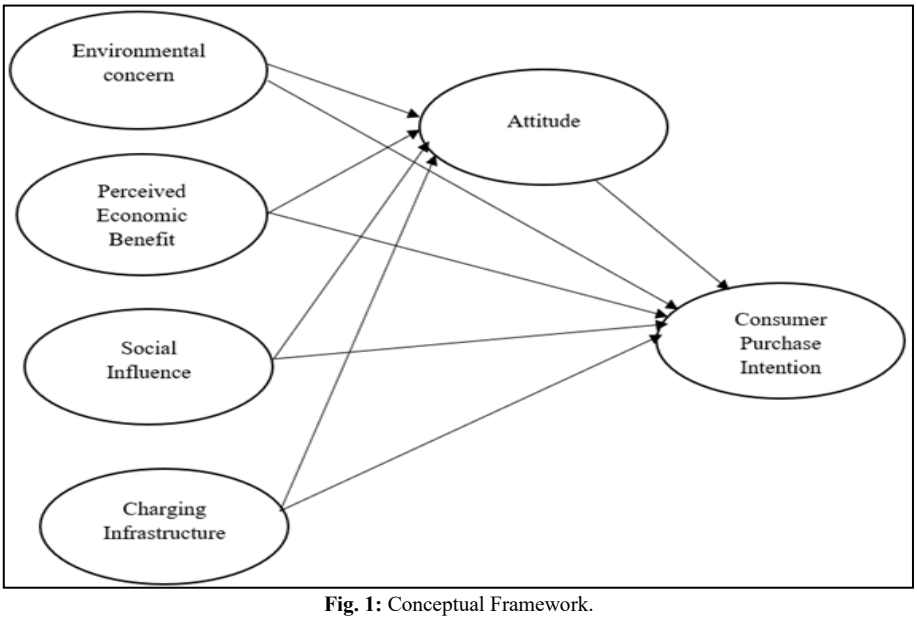


Fig. 1: Conceptual Framework.

3.2. Research hypotheses

Ho1: Environmental Concern (EC) positively affects Consumer Purchase Intention (CPI).
Ho2: Perceived Economic Benefit (PEB) positively affects Consumer Purchase Intention (CPI).
Ho3: Social Influence (SI) positively affects Consumer Purchase Intention (CPI).
Ho4: Charging Infrastructure (CI) positively affects Consumer Purchase Intention (CPI).
Ho5: Environmental Concern (EC) positively affects Attitude (AT).
Ho6: Perceived Economic Benefit (PEB) positively affects Attitude (AT).
Ho7: Social Influence (SI) positively affects Attitude (AT).
Ho8: Charging Infrastructure (CI) positively affects Attitude (AT).

3.3. Methodology

The sampling procedure used for this research was the non-probability sampling procedure. The data for this research were collected using purposive sampling techniques, including one of the non-probability sampling techniques. Identifying all potential two-wheeler buyers in India would be costly, complex, and time-consuming. Purposive sampling was utilised to acquire data from respondents in this study. The questionnaire was developed by analysing multiple adoption scales and metrics from the literature. The questionnaire is divided into two sections. Section A included participants' personal information, such as name, gender, age, education, occupation, family income, vehicle type, and distance travelled. Section B covers understanding of Electric Scooter, environmental concerns, economic benefits, social influence, charging infrastructure, attitude, and consumer purchase Intention and the questions adapted from (Jayasingh et, al 2021). The minimum sample size can be calculated using many methods. According to Hair et al. (2017), this study used a five-point Likert scale, with "strongly agree" rated as one and "strongly disagree" as five. To determine the sample size, start by identifying the construct in the model with the highest number of pathways. The sample size should be at least ten times the number of structural routes leading to the detected construct. The suggested conceptual model suggests four steps that lead to the construct attitude. For this study, a minimum sample size of 99 respondents was determined using the aforementioned approach. The minimal needed sample size for this research was determined using Faul's G*power sample size analysis tool (Faul et al, 2007).
Hair et al. (2017) suggest that for PLS-SEM, a sample size can be justified using the "10-times rule", which recommends that the sample should be 10 times the maximum number of paths pointing at any construct. For a model with four factors and a manageable number of indicators per construct, a sample of 90 can be taken for analysis

- Environmental Concern (EC)
- Perceived Economic Benefit (PEB)
- Social Influence (SI)
- Charging Infrastructure (CI)
- Attitude (AT)
- Consumer Purchase Intention (CPI)

And structural paths are:

- EC → AT
- PEB → AT
- SI → AT
- CI → AT
- AT → CPI

Hence, the incoming paths:

- AT has 4 incoming paths (from EC, PEB, SI, CI)
- CPI has 1 incoming path (from AT)
- The maximum number of paths pointing at one construct is 5.
- As per the rule: 10 × 5 = 50 → Minimum sample size is 50.
- Since we have a sample of 99, it is well above the minimum required.

4. Results & Interpretation

4.1. Percentage analysis

Table 1: Demographic Profile of the Respondents (n=99)

Variables	Category	Frequency (F)	Percentage %
Gender	Male	45	45.45
	Female	55	55.55
	Total	99	100
Age	Below 21 years	11	11.11
	21 to 30	20	20.20
	31 to 40	34	34.34
	41 to 50	27	27.27
	Above 50 years	7	7.7
	Total	99	100
Education Qualification	School level	13	13.13
	Under Graduate	37	37.37
	Post Graduate	28	28.28
	Professional	21	21.21
	Total	99	100
Occupation	Self Employed	36	36.36
	Government Employee	21	21.21
	Private Employee	26	26.26
	Professional	16	16.16
	Total	99	100
Monthly Family Income	Under 50,000	7	7.7
	50,000-1,00,000	29	29.29
	1,00,000- 1,50,000	31	31.31
	1,50,000- 2,00,000	17	17.17
	Above 2,00,000	15	15.15
	Total	99	100

The demographic analysis of electric scooter users in Vellore reveals a slight female preference, with women accounting for 55.55% of the responses. This shows that females are more likely to engage with electric vehicles (e-vehicles), potentially due to a greater understanding of sustainability and convenience. Marketers should customise advertising to promote aspects that women value, such as safety and

environmental friendliness. 37.37% of respondents possess undergraduate degrees, while 28.28% have postgraduate degrees. This suggests that consumers with a basic level of education are more likely to be aware of the benefits of e-scooters. Marketing efforts should focus on informing potential purchasers about the environmental benefits and economic savings connected with electric scooters. The age distribution shows that the largest group of responders is 31-40 (34.34%), followed by 41-50 (27.27%) and 21-30 (20.20%). Middle-aged people may choose practical transportation choices; therefore, marketing should emphasise the time-saving and convenience benefits of electric scooters for busy lifestyles. A significant proportion of respondents (36.36%) work in the Self-Employee, showing a demographic interested in modern transit alternatives. The group's preference for modern technologies can be used to promote electric scooters as stylish alternatives to regular cars. Many respondents earn between ₹1,00,000 and ₹1,50,000 per month, indicating they can afford to invest in electric scooters. Understanding this income group enables manufacturers and marketers to develop price tactics and financing solutions tailored to these consumers, thereby increasing sales. In summary, the demographic research shows that women, basic-level (UG) educated, middle-aged adults, and self-employed represent significant consumer segments in Vellore's electric scooter sector. Using these insights, stakeholders may create customised marketing strategies and product offerings that appeal to this changing consumer base.

4.2. Measurement model

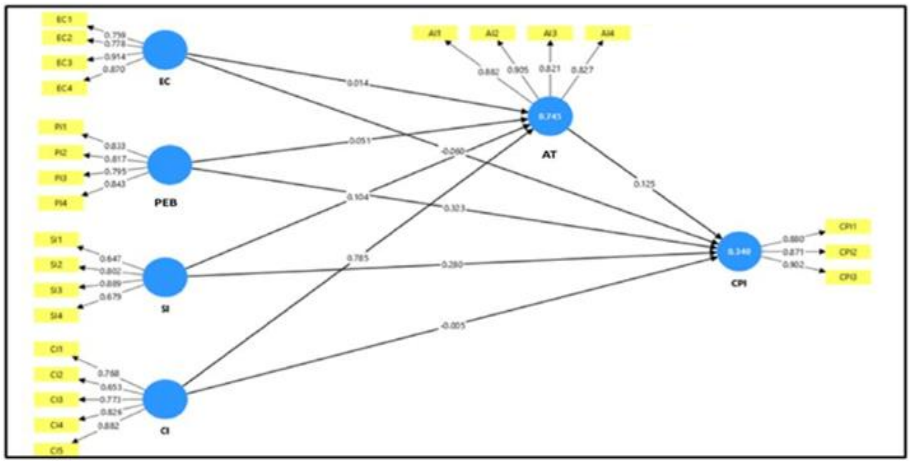


Fig 2: Measurement Model of the Study – PLS SEM.

Source: PLS-SEM Output.
(Note: Environmental concern (EC), Perceived Economic Benefit (PEB), Social Influence (SI), Charging Infrastructure (CI), Attitude (AT), Consumer Purchase Intention (CPI)).

Table 2: Reliability and Convergent Validity Results

Variables	Code	Convergent Validity, Internal Consistency, Reliability				
		Loadings	Average Variance Extracted (AVE)	Cronbach's Alpha (a)	Composite Reliability(rho-a)	Composite Reliability(rho-c)
Environmental Concern (EC)	EC1	0.880	0.693	0.858	0.901	0.900
	EC2	0.871				
	EC3	0.902				
	EC4	0.870				
Perceived Economic Benefit (PEB)	PEB1	0.833	0.676	0.841	0.856	0.893
	PEB2	0.817				
	PEB3	0.795				
	PEB4	0.843				
Social Influence (SI)	SI1	0.647				
	SI2	0.802	0.578	0.755	0.761	0.844
	SI3	0.889				
	SI4	0.679				
Changing Infrastructure (CI)	CI1	0.768	0.615	0.841	0.855	0.888
	CI2	0.653				
	CI3	0.773				
	CI4	0.826				
	CI5	0.882				
Attitude (AT)	AT1	0.882	0.621	0.826	0.868	0.885
	AT2	0.905				
	AT3	0.821				
	AT4	0.827				
Consumer Purchase Intention (CPI)	CPI1	0.886	0.782	0.861	0.874	0.915
	CPI2	0.871				
	CPI3	0.902				

Source: Primary Data.

The measurement model has been evaluated in terms of reliability, convergent validity, and indicator loadings. Table 2 summarises the results of construct reliability and validity by providing the outer loadings of the indicators. Cronbach's alpha (ρa) and composite reliability (ρc) were used to evaluate construct dependability. All constructs indicated acceptable reliability. Cronbach's alpha values were between

0.755 (SI) and 0.861 (CPI), exceeding the widely accepted criterion of 0.70 (Hair et al., 2019). Composite reliability (ρc) scores for all constructions were over 0.844, confirming internal consistency reliability. Scores above 0.70 are deemed satisfactory. These findings suggest that the latent constructs have appropriate internal consistency. Convergent validity was investigated using the Average Variance Extracted (AVE). All constructs obtained AVE values above the 0.50 standards (Fornell & Larcker, 1981), ranging from 0.578 (SI) to 0.782 (CPI), indicating adequate convergent validity. Table 2 shows the outer loading values of various items for their respective constructs. Overall, item loadings exceeded the required level of 0.70, indicating significant reliability. For constructs of CPI, EC, and PEB, all indicators loaded strongly (>0.75) on their respective latent variables. AT4 (loading = 0.827), SI1 (0.647), SI4 (0.679), and CI2 (0.653)—exhibited loadings below the acceptable level. These elements may be removed or reevaluated because they have the potential to decrease the measurement model's reliability.

Despite the presence of a few lower-loading signs, the overall loading pattern confirms the structures' unidimensionality and reflectivity. Overall, the findings confirm the reliability and validity of the constructs used in this investigation. Internal consistency, convergent validity, and most indicator loadings all satisfy established requirements, with only a few items requiring additional evaluation

4.3. Discriminant validity

Table 3: Discriminant Validity

	AT	CI	CPI	EC	PEB	SI
AT						
CI	1.009					
CPI	0.474	0.384				
EC	0.384	0.368	0.267			
PEB	0.588	0.543	0.598	0.517		
SI	0.560	0.476	0.589	0.524	0.679	

The constructs being evaluated include AT, CI, CPI, EC, PEB, and SI. Each cell below the diagonal indicates the HTMT value of two constructions. As a general rule, HTMT values less than 0.85 indicate that discriminant validity has been established; however, values higher than this threshold may indicate a lack of discriminant validity. All HTMT values are less than the cautious criterion of 0.85, with the highest recorded value being 0.679 between SI and PI. This indicates that all construct pairs have appropriate discriminant validity. As a result, the constructs under research are empirically distinct and do not display significant multicollinearity, which supports the measurement model's validity.

Table 4: Structural Path Coefficient (Direct Effects)

Hypotheses	Paths	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T Statistics (|O/ STDEV|)	P values	Results
Ho1	EC -> CPI	-0.058	-0.049	0.099	0.588	0.577	Reject
Ho2	PEB -> CPI	0.329	0.338	0.142	2.312	0.021	Accept
Ho3	SI -> CPI	0.293	0.283	0.144	2.039	0.042	Accept
Ho4	CI -> CPI	0.093	0.105	0.103	0.898	0.369	Reject
Ho5	EC -> AT	0.014	0.011	0.077	0.0183	0.855	Reject
Ho6	PEB -> AT	0.051	0.054	0.078	0.647	0.518	Reject
Ho7	SI -> AT	0.104	0.103	0.065	1.602	0.109	Reject
Ho8	CI -> AT	0.785	0.783	0.063	12.502	0.000	Accept

The total effects table illustrates the extent and statistical significance of correlations between constructs, including AT, CI, CPI, EC, PEB, and SI. Each path's importance is evaluated using t-statistics and p-values, with $p < 0.05$ indicating 5% significance. The relationship between CI and AT is statistically significant (O = 0.785, t = 12.502, p = 0.000), demonstrating that CI positively impacts AT. Both PEB and SI have statistically significant positive impacts on CPI (O = 0.329, t = 2.312, p = 0.021, and O = 0.293, t = 2.039, p = 0.042, respectively), indicating that they both play a substantial role in CPI. Paths like AT → CPI, CI → CPI, EC → AT, EC → CPI, PEB → AT, and SI → AT have p-values higher than 0.05, indicating no significant total effects at the conventional level. AT→ CPI (O = 0.125, p = 0.513) and EC → CPI (O = -0.058, p = 0.557) do not have a statistically significant impact in the current model. Overall, the data show that customer involvement has a substantial direct impact on AT, as does perceived and social influence on purchase intention. These findings provide empirical support for the hypothesised links in the proposed model, as well as identifying paths that may require re-evaluation or further theoretical elaboration due to a lack of statistical significance.

Table 5: Mediation Effects

Special Indirect paths	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T Statistics (|O/ STDEV|)	P values
CI -> AT -> CPI	0.098	0.095	0.154	0.641	0.522
EC -> AT -> CPI	0.002	-0.001	0.017	0.105	0.916
PEB -> AT -> CPI	0.066	0.006	0.019	0.327	0.743
SI -> AT -> CPI	0.013	0.013	0.024	0.532	0.594

The results highlight specific indirect effects from a structural equation modelling (SEM) analysis, with an emphasis on the construct AT's mediation function in the link between other independent variables (CI, EC, PEB, SI) and the dependent variable CPI. Each row represents a specific mediated path and includes values for the original sample (O), sample mean (M), standard deviation (STDEV), T-statistics, and corresponding p-values. The precise indirect effects shown in this table determine if the variable AT significantly mediates the relationships. The p-values for all four mediated paths are above the standard significance threshold of 0.05, indicating non-mediation effects. The indirect impact of CI → AT → CPI shows a coefficient of 0.098 and a t-statistic of 0.641 (p = 0.522), indicating no significant mediation. Similarly, EC → AT → CPI has a negligible indirect effect (O = 0.002, p = 0.916), indicating a lack of mediating role. Both PEB → AT → CPI and SI → AT → CPI have insignificant indirect effects (O = 0.006 and 0.013, respectively), with p-values of 0.743 and 0.594, indicating non-significance. The findings show that Attitude (AT) is not a major mediator in the interactions between CI, EC, PEB, or SI and CPI. These findings demonstrate that, while Attitude (AT) may play a direct role in some model pathways (as suggested by previous total effects results), it does not mitigate the influence of the aforementioned antecedents on purchase intention in the current model. Further research

may be necessary to investigate alternative mediating variables or to reassess the role of Attitude (AT) within the conceptual framework. Several earlier studies grounded in the Theory of Planned Behavior (TPB) argue that favorable attitudes serve as a key conduit through which environmental concern and pro-environmental orientations influence intention formation. However, the absence of a mediating effect in the current model suggests that attitude alone may be insufficient to bridge the intention–behavior gap in contemporary consumption contexts. This contradiction indicates that consumers may hold positive attitudes toward sustainability without necessarily converting them into purchase intentions, especially when faced with practical constraints such as price sensitivity, perceived greenwashing, limited trust, or low perceived behavioral control.

5. Discussion

Hypothesis 1: Environmental Concern (EC) positively affects the Consumer Purchase Intention (CPI)
The results did not support the premise that environmental concern (EC) positively increases consumer purchase intention (CPI). Although environmental awareness is frequently mentioned as a crucial incentive for sustainable consumption, the direct association between EC and CPI in this model was statistically insignificant ($p = 0.557$). This shows that, despite customers' stated concern for the environment, such an attitude does not significantly impact their intention to purchase, probably due to other overriding concerns, such as economic or infrastructure considerations.
Hypothesis 2: Perceived Economic Benefit (PEB) positively affects the Consumer Purchase Intention (CPI)
The hypothesis was supported, as perceived economic benefit (PEB) had a significant and positive effect on purchase intention (CPI) ($t = 2.312$, $p = 0.021$). This suggests that when consumers see concrete financial benefits or cost-efficiency from a purchase, such as lower operating expenses or government incentives, they are more likely to buy. Thus, economic rationality is crucial in moulding consumer behaviour in this situation.
Hypothesis 3: Social Influence (SI) positively affects the Consumer Purchase Intention (CPI)
The study demonstrated the hypothesis, indicating a statistically significant positive relationship between social influence (SI) and purchase intention (CPI) ($t = 2.039$, $p = 0.042$). This demonstrates how social norms, peer pressure, and recommendations from family and friends can influence customers' purchase decisions. Consumers may be affected by others who embrace green behaviours or technology, highlighting the relevance of social evidence in encouraging environmentally responsible decisions.
Hypothesis 4: Charging Infrastructure (CI) positively affects the Consumer Purchase Intention (CPI)
The results did not support this hypothesis. While charging infrastructure (CI) had a large and significant impact on customer attitude (AT), there was no statistically significant direct effect on purchase intention (CPI). This implies that while the availability of infrastructure may influence perceptions and attitudes, it does not directly translate into a stronger intent to purchase in the existing framework.
Hypothesis 5: Environmental Concern (EC) positively affects Attitude (AT)
This hypothesis was not supported since the transition from environmental concern (EC) to attitude (AT) was not statistically significant. While EC may be expected to influence a consumer's favourable perception of eco-friendly behaviour, the data indicate that concern for the environment alone does not significantly change how consumers feel or think about the product or behaviour being evaluated.
Hypothesis 6: Perceived Economic Benefit (PEB) positively affects Attitude (AT)
The predicted connection between perceived economic benefit (PEB) and attitude (AT) was similarly statistically insignificant, hence the hypothesis was rejected. Although customers may perceive economic benefits from acquiring a specific product, these benefits do not always convert into a more positive attitude towards the product, indicating a potential gap between rational judgment and emotional or psychological acceptance.\
Hypothesis 7: Social Influence (SI) positively affects Attitude (AT)
The results did not support this hypothesis, as there was no statistically significant relationship between social influence (SI) and attitude (AT). Although social influence clearly affects purchase intention, it does not appear to have a significant direct impact on consumer opinions. In this scenario, social influence may induce greater action than belief change.
Hypothesis 8: Charging Infrastructure (CI) positively affects Attitude (AT)
This was the only attitude-related hypothesis that was accepted, with charging infrastructure (CI) having a substantial, significant positive effect on attitude (AT) ($t = 12.502$, $p = 0.000$). This suggests that increasing the availability and visibility of charging stations or infrastructure may improve consumers' views and assessments, making them more likely to adopt electric or sustainable technology. It emphasises the relevance of the physical environment and support systems in creating customer opinions.
The findings reveal a clear distinction between environmental values and actual purchase motivation. Despite widespread assumptions in sustainability research, environmental concern did not significantly influence either consumer attitude or purchase intention, indicating a persistent attitude–intention gap. This suggests that environmental awareness alone is insufficient to drive adoption unless supported by enabling conditions. In contrast, perceived economic benefit emerged as a key determinant of purchase intention, highlighting the centrality of financial rationality in consumer decision-making. These results underscore the importance of effective public subsidy design and market-aligned pricing strategies that reduce upfront costs, enhance cost transparency, and clearly communicate long-term economic savings to consumers. Social influence was also found to significantly affect purchase intention, though it did not shape consumer attitudes. This implies that social norms and peer behavior can stimulate adoption directly without necessarily altering individual beliefs, emphasizing the role of social visibility and collective acceptance in sustainable consumption. Policymakers and firms can leverage this mechanism through community-based promotion and social endorsement initiatives embedded within broader urban mobility planning frameworks, particularly in dense urban settings where peer effects are more pronounced. Charging infrastructure played a crucial role in shaping consumer attitudes, but did not directly translate into higher purchase intention. This finding suggests that infrastructure availability functions as a psychological and contextual enabler rather than an immediate trigger for adoption. Consequently, comprehensive urban mobility planning that prioritizes visible and accessible charging infrastructure can enhance consumer confidence and favorable perceptions, while coordinated policy measures—combining infrastructure development, public subsidy design, and strategic pricing—are necessary to convert positive attitudes into actual purchase intentions.

6. Conclusion

This study has various limitations that must be noted. First of all, the results' generalisability is limited, as the data were collected through a non-random online survey based on voluntary participation, restricted to respondents from the Vellore district. Second, the study focused on only five key factors identified through a literature review, potentially overlooking other variables that may influence Indian consumers'

purchase intentions. Future research could expand the scope by including additional factors such as performance, non-monetary rewards, and consumer knowledge. Additionally, this research considered only perceived economic benefits, excluding non-economic benefits. Future studies should examine non-economic benefits as a separate variable to assess their comparative impact on both financial and non-financial outcomes. Researchers could also explore the moderating and mediating roles of socio-demographic factors such as income, age, gender, and geographic location. Lastly, this research measured only the intention to purchase rather than actual purchasing behavior. Future research should incorporate models that capture and analyse actual consumer behavior.

This study provides an in-depth inquiry into the factors influencing consumer purchase intentions for electric scooters in the Vellore district. Based on existing behavioral theories and empirically tested using Partial Least Squares Structural Equation Modeling (PLS-SEM), the study identified perceived economic benefits and social influence as the most significant direct influences on consumer purchase intention. Contrary to popular belief, environmental concern and charging infrastructure had little or no statistically significant direct effects on purchase intention, even though charging infrastructure had a considerable impact on customer views. Furthermore, the mediating role of consumer attitude in the relationship between exogenous variables and buy intention was completely unsupported, implying that behavioural intentions in this setting are influenced more by external incentives and social dynamics than by internal attitudinal changes. These findings emphasise the complex interplay between economic rationality and socio-cultural influences on consumer preferences for sustainable mobility options. While environmental consciousness remains an essential societal narrative, it does not always translate into practical consumer behaviour in this expanding market category. The findings encourage governments and marketers to rethink their approach, emphasising economic incentives, observable social proof, and infrastructure development rather than relying entirely on environmental messaging. Future studies should build on this approach by incorporating additional variables such as technology performance, brand trust, and actual usage behaviour, as well as investigating regional and demographic variation over greater geographic scopes. Such efforts will add to the ongoing discussion about electric mobility and promote the strategic acceleration of electric vehicle adoption in India.

Author's Contribution

Nowshath Bee A carried out the study, gathered and examined the information, and wrote the first draft of the manuscript. Dr. M. Muthumeenakshi contributed to the final version, oversaw the research, gave conceptual assistance, and critically evaluated the article. The final manuscript has been read and approved by both writers.

Statement of Disclosure

Regarding the publishing of this work, the authors state that they have no conflicts of interest.

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Upon reasonable request, the corresponding author will provide the data supporting the study's conclusions.

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