Perception and Purchase Intention of Customers towards Electric Vehicles

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INTRODUCTION

In the present scenario, air pollution is one of the serious concerns of our country. Many cities in India are highly polluted. Major sectors contributing to air pollution are the industrial sector and the transport sector. 51% of the pollution is caused by industrial pollution, 27% by vehicles, 17% by crop burning, and 5% by other sources. Electric Vehicles offer numerous advantages such as decreasing the pollution level and reducing oil import bills etc.

Electric vehicles (EVs) are vehicles that are powered by an electric motor and battery, instead of an internal combustion engine that runs on gasoline or diesel. They use electricity from an external power source to charge their batteries, which then powers the vehicle's motor.

Viewing the positive and the negative impacts, the consumer's perception of electric vehicles in India has drastically changed. Innovation has taken a quantum leap, which encourages the consumer to think more about the affordability, eco-friendliness, and excellent service for an e-vehicle. Constant promotion from the government side has resulted in a more positive mindset and increased knowledge about e-vehicles among consumers.

Recent changes in national and international environmental policy give a lot of emphasis on electric vehicles (EVs) as they reduce ecological damage by eliminating emissions. However, given the products' novelty, consumers have expressed mixed emotions about purchases of EVs. Skepticism surrounding EVs' reliability is a significant concern for potential buyers, primarily due to a lack of essential support.

The state of Kerala has seen a surge in the number of vehicles, especially two-wheelers, which are major contributors to air pollution. The adoption of EVs can help to reduce air pollution and improve the health of citizens.

This study aims to identify the perception towards electric vehicles and the impact on consumers' purchase intention. The majority of the obstacles in the purchase and promotion of EVs may be recognized by understanding these aspects, and research can be conducted to address these obstacles, which can help to expand the adoption of electric vehicles in Kerala and later in India. It is done specifically with regard to the State of Kerala, so as to recognize the State Government's initiatives to encourage the usage of EVs.

Statement of the Problem

Despite the presence of Government incentives aimed at promoting electric vehicle adoption, a significant reluctance persists among consumers, indicating a gap between policy efforts and public willingness to embrace sustainable transportation options. The study aims to investigate the perception of consumers of electric vehicles and their role on purchase intention of electric vehicles.

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Scope of the Study

The study focuses on the consumers' perception and purchase intention towards electric vehicles in Kerala. It explores the factors influencing consumers' choice, such as environmental concerns, cost considerations, and technological perceptions.

Significance of the Study

Studying perception towards electric vehicles (EVs) and its impact on consumer preference is significant for understanding the factors influencing its adoption. It can shed light on environmental concerns, cost considerations, and technological perceptions that shape consumers' choices. This research may guide policymakers, manufacturers, and marketers in promoting sustainable transportation by addressing barriers and enhancing positive perceptions towards EVs.

Furthermore, the study can contribute valuable insights into the potential challenges and opportunities in the electric vehicle market. Additionally, understanding how consumer perception evolves helps in designing policies and effective awareness campaigns.

REVIEW OF LITERATURE

Growing petrol prices, environmental protection against noise, reducing carbon emissions, and fostering a greener environment are the main reasons behind the government policies to encourage people to use electric vehicles. Consumers switch from petrol vehicles to ecologically friendly electric vehicles to save money (P Kumarasamy and M Krishnamoorthi, 2024). EVs are coming on the Indian road with great popularity; however, some factors such as charging infrastructure, battery life of EVs, etc. are still challenging (Lalit N Patil, et al, 2024). Electric vehicles (EVs) and electric mobility are the wave of the future of transportation. Electric vehicles will cause significant changes in the automobile sector (Dalvinder Singh Wadhwa, et al, 2024). Driving obstacles, charging obstacles and willingness-to-pay from consumers are the main obstacles that limit the social acceptance in adopting EVs (Vigna K Ramachandaramurthy, et al , 2023). The major factors which are influencing the consumers' intention to buy or not buy electric vehicles are demographic factors, marketing, charging stations, and government policy (Unnati Tuladhar, et al, 2023). Improvements in battery technology and vehicle performance have impact on consumer preferences for electric vehicles in the Indian market (Singh S & Gupta N, 2022). Most consumers are aware of the internet as a major information source in addition to television and print. Consumers are driven by a range of factors, such as environmental awareness, low noise levels, cost, and emerging trends (Parmar and Pradhan, 2021). Socioeconomic factors such as income, education level, and occupation influence consumer preferences towards electric vehicles (Gupta S & Kumar R, 2020). Factors such as awareness levels, perceived benefits and drawbacks, concerns regarding charging infrastructure and driving range, government policies and incentives, and the influence of socio-demographic variables on consumer preferences are influencing Consumers' Preference for Electric Vehicles (Anish K. Ramaprasad and B. N. Prashanth, 2019).

Hence, the aim of this study is to investigate the role of perception on the consumer purchase intention of electric vehicles. Following the literature review and preliminary studies aforementioned, the current study proposed the following objectives and hypothesis:

Objectives:

1. To identify the perception of consumers towards Electric vehicles.
2. To ascertain the intention of consumers to purchase Electric vehicles.
3. To ascertain the relationship between perception and purchase intention of Electric Vehicles.

Hypotheses:

1. Ho: There is no significant difference in the perception towards electric vehicles among respondents of different demographic features.
2. Ho: The respondents are neither willing nor unwilling to purchase electric vehicles

3. Ho: There is no relation between perception towards features of electric vehicles and purchase intention

RESEARCH METHODOLOGY

Research Design

This research is descriptive in nature and is conducted using a cross-sectional research design, with questionnaires collected online from respondents. The data were collected from a total of 200 respondents were collected, with 190 respondents passing the initial screening. Sample size of the study is 162. Further, SPSS is used for analysing the data.

Measurement

Perception of consumers towards EVs was measured with a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. Level of intention towards purchase of EVs was measured with a five-point Likert scale ranging from 1 = very unlikely to 5 = very likely.

RESULTS AND DISCUSSION

Data collection was conducted during December 2024-March 2025. Complete demographic profiles of respondents in this research are shown in Table 1.

Demographic Factors	Categories	No. of respondents	Percentage
1. Gender	Female	93	57
	Male	69	43
	Total	**162**	**100**
2. Locality	Rural	94	58
	Semi urban	29	18
	Urban	39	24
	Total	**162**	**100**
3. Educational qualification	Up to plus two	16	10
	Diploma/ITI certificate, etc.	5	3
	Batchelor's Degree	81	50
	PG	60	37
	Total	**162**	**100**
4. Travel requirement	Two or three journeys daily	17	10
	Daily	111	69
	Twice or thrice in a week	18	11
	Rarely	16	10
	Total	**162**	**100**

Measurement Results

Perception of customers towards EVs

The following table presents the mean values and standard deviations of the respondents' agreement to the assertions on a five-point Likert scale, which is used to gauge their perception towards positive factors and negative factors of EVs.

Table 2: Matrix for measurement scales regarding perception of respondents towards EVs

Statements	Mean	SD	Sig Value
Perception towards positive factors			
1. It is environmental friendly	3.88	1.054	0.000
2. EVs reduces noise pollution	3.43	0.977	0.000

3. EVs will give the owner a social status	3.65	1.112	0.000
4. Future roads will be ruled by EVs	3.93	1.046	0.000
5. Running cost of EV is low as electricity is cheaper	3.51	1.005	0.000
6. Maintenance cost of EV is low	3.84	1.163	0.000
Overall perception towards positive factors	3.71	0.640	0.000
Perception towards negative factors			
1. EVs are not suitable for long journeys as distance covered by EV in a single charge is low	3.69	0.922	0.000
2. Less reliable	3.69	0.916	0.000
3. EVs are easily prone to fire	3.21	0.815	0.001
4. Charging facilities are less	4.17	1.067	0.000
5. Cost of replacement of battery is more	3.75	1.058	0.000
6. Technology used in EVs will be outdate in future	3.91	1.030	0.000
Overall perception towards negative factors	3.74	0.684	0.000

Perception towards the features of EVs among different demographic groups was tested to ascertain whether there exist any significant difference in the perception among such groups by administering one way ANOVA and t test as below.

Demographic factor	***Sig. value***	***Reject or fail to reject Ho***	***Remarks***
Perception towards positive features of EV			
Gender	0.074	Accept	There is no significant difference in perception towards positive factors of EVs between male respondents and female respondents.
Locality	0.052	Accept	There is no significant difference in perception towards positive factors of EVs among respondents from different geographical areas.
Educational qualification	0.318	Accept	There is no significant difference in perception towards positive factors of EVs among respondents of different educational qualification.
Travel requirement	0.034	Reject	There is significant difference in perception towards positive factors of EVs among respondents having different travel requirement.
Perception towards negative features of EV			
Gender	0.055	Accept	There is no significant difference in perception towards negative factors of EVs between male respondents and female respondents.
Locality	0.005	Reject	There is significant difference in perception towards negative factors of EVs among respondents from different geographical areas.
Educational qualification	0.209	Accept	There is no significant difference in perception towards negative factors of EVs among respondents of different educational qualification.
Travel requirement	0.026	Reject	There is significant difference in perception towards negative factors of EVs among respondents having different travel requirement

Purchase intention of customers towards electric vehicles

A hypothesis test was administered using one sample t test to know the purchase intention of the respondents with the following hypothesis.

Ho: The respondents are neither willing nor unwilling to buy EVs

Statements	Mean	SD	Sig Value
I will purchase EV	2.73	0.869	0.000

The hypothesis is rejected and concluded that the respondents are not willing to buy EVs.

Besides the above, purchase intention among different demographic groups was also tested to ascertain whether there exists any significant difference in the perception among such groups by administering one way ANOVA and t test as below.

Demographic factor	***Sig. value***	***Reject or fail to reject Ho***	***Remarks***
Gender	0.61	Accept	There is no significant difference in purchase intention between male respondents and female respondents.
Locality	0.84	Accept	There is no significant difference in purchase intention among respondents from different geographical areas.
Educational qualification	0.41	Accept	There is no significant difference in purchase intention among respondents of different educational qualification.
Travel requirement	0.00	Reject	There is significant difference in purchase intention among respondents having different travel requirement. It is found that the respondents who have more travel requirement are willing to purchase EVs.

Relation between perception and purchase intention of customer towards EVs

Positive factors

Ho: There is no significant relation between perception towards positive factors of EVs and purchase intention

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.643	.394		4.168	.000
	Perception towards positive factors	.294	.105	.217	2.811	.006
a. Dependent Variable: Intention to purchase EVs						

Regression Equation

Y=1.643+0.294X

As p value < 0.05, Ho is rejected, i.e. there is significant relation between perception towards positive factors and purchase intention

Negative factors

Ho: There is no significant relation between perception towards negative factors of EVs and purchase intention

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.255	.379		5.946	.000
	Perception towards negative features of EV	.128	.100	.101	1.284	.201
a. Dependent Variable: Purchase intention						

As p value > 0.05, Ho is accepted, i.e. there is no significant relation between perception towards negative factors and purchase intention.

CONCLUSIONS

The study reveals that there is a significant difference between perceptions about EVs and a few demographic characteristics of respondents. The study further reveals though the respondents who have more travelling

requirement are willing to purchase EVs, generally the respondents are not willing to purchase EV. Though there is significant relation between perception towards positive factors of EV and purchase intention, there is no significant relation between perception towards negative factors of EV and purchase intention.

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