

A COMPARITIVE STUDY ON CONSUMER PREFERENCE BETWEEN ELECTRIC CARS & CONVENTIONAL CARS AT COIMBATORE CITY

SURYA.T.M., II MBA.,

Department of Management Studies [PG] & Research.,

V.L.B Janakiammal College of Arts and Science (Autonomous) Kovaipudur, Coimbatore – 641042

Dr.R. TAMIL SELVI., Assistant professor Department of Management Studies [PG] & Research

V.L.B Janakiammal College of Arts and Science (Autonomous) Kovaipudur, Coimbatore – 641042

ABSTRACT

The global automobile industry is experiencing a major transition from conventional internal combustion engine (ICE) vehicles to electric vehicles (EVs) due to increasing environmental concerns, rising fuel prices, and rapid technological advancements. This study aims to analyze and compare customer preferences towards electric vehicles and conventional cars with special reference to Coimbatore city. The research focuses on identifying key factors influencing consumer purchase decisions, including operating cost, maintenance cost, environmental awareness, driving range, charging infrastructure, and familiarity with EV technology. The study is based on primary data collected from 154 respondents through a structured questionnaire and supported by secondary data from journals, reports, and published sources. Statistical tools such as percentage analysis, chi-square test, correlation, and ANOVA were used for data analysis. The findings indicate that although consumers recognize the environmental benefits and lower operating costs of electric vehicles, challenges such as high initial purchase cost, limited charging infrastructure, and range anxiety continue to restrict widespread adoption. Conventional and hybrid cars remain preferred due to their convenience, established refuelling infrastructure, and suitability for longdistance travel. The study concludes that improved infrastructure, supportive government policies, and increased consumer awareness are crucial for accelerating the adoption of electric vehicles.

Keywords :Electric Vehicles (EVs), Conventional Cars, Consumer Preference, Purchase Decision, Environmental Awareness, Charging Infrastructure, Coimbatore City.

INTRODUCTION

The global automotive sector is undergoing a significant transition toward electric vehicles (EVs) driven by environmental concerns, rising fuel costs, and technological advancements. EVs are increasingly preferred due to their lower carbon emissions, superior energy efficiency, and reduced operating and maintenance costs compared to conventional internal combustion engine vehicles. However, widespread adoption remains limited by factors such as high initial purchase costs, inadequate charging infrastructure, battery-

related concerns, and range anxiety. In contrast, conventional and hybrid vehicles continue to hold a substantial market share due to established refuelling infrastructure, consumer familiarity, and flexibility for long-distance travel. Understanding consumer preferences and perceived barriers is essential for evaluating the future adoption of EVs and for framing effective policy and infrastructure development strategies .

Research Background

The transition toward sustainable mobility has intensified interest in electric vehicles (EVs) as an alternative to conventional internal combustion engine vehicles. EVs offer advantages such as reduced carbon emissions, improved energy efficiency, and lower operating costs. However, despite supportive government policies and technological advancements, consumer adoption remains limited due to economic, infrastructural, and psychological barriers. **Objectives of the study**

1. To examine consumer preferences toward electric and conventional vehicles
2. To identify factors influencing vehicle purchase decisions
3. To analyze perceived barriers to electric vehicle adoption

Statement of the problem

While electric vehicles present significant environmental and long-term economic benefits, their market penetration remains lower than that of conventional vehicles. High initial purchase costs, inadequate charging infrastructure, battery-related concerns, and range anxiety continue to influence consumer purchase decisions, necessitating a comparative analysis of consumer preferences.

Scope of the study

The study focuses on consumer perceptions and preferences regarding electric and conventional vehicles within a selected geographical region. Key variables include cost, performance, charging infrastructure, environmental impact, and usage patterns.

Limitations of the study

1. The study is limited to a specific geographical area.
2. A relatively small sample size restricts generalization.
3. Findings are based on self-reported data and may involve respondent bias.
4. Time constraints limited deeper analysis.

Review of Literature

Previous studies highlight several factors influencing consumer preference and adoption of electric vehicles (EVs).

Egbue and Long (2022) identified environmental concern as a major driver of EV adoption, though actual purchase behavior is moderated by cost and convenience.

Bühler et al. (2022) emphasized that high initial purchase cost remains a key barrier, particularly in emerging markets, despite the advantage of lower operating costs and government incentives.

Hardman et al. (2022) reported that limited charging infrastructure and range anxiety significantly hinder EV adoption.

Wang et al. (2022) found that while EV users are satisfied with environmental benefits and driving comfort, concerns about charging time and driving range affect satisfaction levels, whereas conventional vehicle users value reliability and refuelling convenience.

Ghosh et al. (2023) highlighted the role of government subsidies and infrastructure development in improving EV adoption, although inconsistent policy implementation remains a challenge in India.

Studies by Buhmann and Criado (2023) and Rogers (2023) revealed that social influence, status, and lifestyle compatibility play an important role in EV preference.

Guo (2024) and Kanujiya and Yadav (2024) emphasized the importance of education, media influence, and technological advancements in reducing consumer anxiety and improving adoption.

Recent Indian studies (Wagh, 2025; Vidani & Plaha, 2025) indicate that charging infrastructure, operating cost, and government schemes like FAME significantly influence EV adoption, highlighting the need for region-specific research on consumer preferences.

RESEARCH METHODOLOGY

Sampling Plan

The study adopts a convenience sampling technique. A sample of 154 respondents was selected from Coimbatore city to ensure adequate representation.

Type of Sampling

Convenience sampling, a non-probability sampling method, was used as respondents were selected based on accessibility and willingness to participate.

Methods of the Study

The study uses both primary and secondary data sources.

Primary Data:

Primary data were collected through a structured questionnaire administered using Google Forms. The questionnaire consisted of 25 questions related to consumer preferences toward electric and conventional vehicles.

Secondary Data:

Secondary data were collected from journals, books, research articles, websites, and reports. Statistical Tools Used
 Percentage Analysis Chi-square Test

Percentage Analysis

Percentage analysis was used to analyze and interpret the distribution of responses in a simple and meaningful manner.

Chi-square Test

The Chi-square test was used to examine the association between selected demographic variables and consumer preferences toward electric and conventional vehicles

ANALYSIS AND INTERPRETATION

Percentage Analysis

- Majority of respondents are young adults, indicating higher awareness of electric vehicles among youth.
- Conventional vehicles are still preferred due to established infrastructure and convenience.
- Cost savings and environmental benefits are the main factors influencing preference for electric vehicles.
- Charging infrastructure and range anxiety remain major concerns limiting EV adoption.
- Most respondents show a positive attitude toward future EV usage.

Chi-square

CHI-SQUARE ANALYSIS BETWEEN AGE OF THE RESPONDENTS AND AVERAGE DAILY DRIVING DISTANCE

NULL HYPOTHESIS

- HO: There is no significance between age of the respondents and average daily driving distance.

ALTERNATIVE HYPOTHESIS

- H1: There is significance between age of the respondents and average daily driving distance.

| Chi-Square Tests | | | |
|------------------|---------------------------|----|-----------------------|
| | Value 22.697 ^a | df | Asymp. Sig. (2-sided) |

| | | | |
|---|--------|----|------|
| Pearson Chi-Square | | 16 | .122 |
| Likelihood Ratio | 25.834 | 16 | .056 |
| Linear-by-Linear Association | .576 | 1 | .448 |
| N of Valid Cases | 154 | | |
| a. 9 cells (36.0%) have expected count less than 5. The minimum expected count is 2.22. | | | |

RESULT

The Pearson Chi-Square test ($\chi^2 = 22.697$, $df = 16$) shows no statistically significant association between the variables, as the p-value of .122 is greater than the standard α of .05. However, the validity of this result is questionable because 9 cells (36.0%) have an expected count less than 5, violating a key assumption for the Chi-Square test.

Findings

- Conventional vehicles are currently preferred due to familiarity and better infrastructure.
- Electric vehicles are favored for lower running costs and environmental benefits.
- High initial cost, limited charging facilities, and range anxiety are major barriers to EV adoption.
- Younger consumers show greater awareness and interest in electric vehicles.

Suggestions

- Improve charging infrastructure and accessibility.
- Provide financial incentives and subsidies to reduce purchase cost.
- Increase consumer awareness about long-term benefits of electric vehicles.
- Encourage technological advancements in battery performance and range.

Conclusion

The study concludes that while electric vehicles offer significant environmental and economic advantages, their adoption is hindered by infrastructural and cost-related challenges. With improved infrastructure, policy support, and awareness, electric vehicles have strong potential to gain wider consumer acceptance in the future.

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