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A STUDY ON CONSUMER PREFERENCE AND SATISFACTION TOWARDS GREEN VEHICLE

Rajesh.D

Sri Krishna aditiya

INTRODUCTION :

INTRODUCTION

India is one of the top ten automotive markets in the world and given its burgeoning middle class population with buying potential and the steady economic growth, acceleration automotive sales is expected to continue. In the last couple of years, there has been a lot of discussion around the prices of fuel – apart from the deregulation of petrol prices. Moreover the threat of disruption of supplies from the middle east has heightened the debate on energy security and brought the focus on to alternate drive train technologies. Globally Electric vehicles are growing at a rapid pace with a compounded annualized growth rate (CAGR) of 21.7 percent, by 2030 it is supposed to grow from
8.1 million units to 39.21 million units. The enormous growth has been influenced by several factors like efficiency, pollution, and environmental concerns. All over the planet governments have started to encourage EV industries by providing subsidies as the consumer continuously demands ecofriendly vehicles rather than petroleum or diesel vehicles.
The automotive industry has witnessed a significant shift towards electric vehicles (EVs) in recent years. With advancements in technology and growing concerns about environmental sustainability, EVs have gained popularity as an alternative to traditional gasoline-powered vehicles. Consumer preference towards electric vehicles plays a crucial role in the widespread adoption of this new mode of transportation. Understanding consumer attitudes, preferences, and concerns regarding EVs is essential for automakers, policymakers, and other stakeholders to effectively promote and support the transition to a sustainable transportation system. India is a country with the third-largest road network in the world. Road travel seemed to be a preferred choice in India with over 60% of the population used personal or shared vehicles to commute. Green vehicles are a major cause of global warming and environmental air pollution. All types of vehicles produce dust from brakes, tires, and road wear. The average diesel vehicle has worse effect on air quality than the average gasoline vehicle. But both gasoline and diesel vehicle pollutes more than the electric vehicle.

STATEMENT OF THE PROBLEM

People all over the country prefer to travel on electric vehicles, which gives them utility and cost-efficient mode for transport. When it comes to electric vehicles are even better than normal bikes as there is no fuel consumption in electric vehicles and in countries like the majority of people in India are from middle class families who cannot afford high fuel prices. Factors that make one want to know about electronic vehicles and applications as easy to use, easy to maintain, travel efficiency, comfortable, durability, available at a very low price and find out if they are proud to buy and use the leading electronic bikes in the particular market. To find out the reasons for buying more e- vehicles, explore if there are any reasons other than this. The electronic vehicles will dominate in the following periods, this research is exactly conducted to find out about this. In the present study, the researcher wants to know whether Coimbatore city consumers are aware of the experience of buying electronic vehicles in their hometown and its concept with satisfaction. By conducting this study, the researcher will be able to provide better insight into How the electronic vehicles will lead the market and attract consumers.

SCOPE OF THE STUDY

This study has focused on both primary and secondary data of electric vehicles in India. Though the research found a potential scope of Electric vehicles in India, still there is a scope for in-depth study with greater number of samples and more factors.As environmental issues are recorded high in India, people are starting to think about saving the environment as much as possible. It is common knowledge that petrol and diesel vehicles cause most of the environmental damage due to which people are shifting to electric vehicles. Although the EV concept is well proven nowadays, people still lack the knowledge or trust in it. They are skeptical about the safety and reliability of electric vehicles. Therefore, this research has been conducted to analyze people's perceptions as per the negatives and positives for electric vehicles and the technology included within

OBJECTIVES OF THE STUDY

1 To identify the factors which influence the consumer to prefer green vehicles
2 To analyze the level of satisfaction of consumer towards green vehicles

RESEARCH METHODOLOGY

Research methodology is a critical aspect of an study, When conducting research in this area, researchers employ systematic and structured approaches to gather data, analyze information, and draw conclusions regarding various aspects of electric vehicles, such as their environmental impact, performance, adoption rates, and consumer preferences. Researchers need to carefully design their studies to address specific research questions related to green vehicles. This might involve choosing between qualitative and quantitative research methods or employing a mixed-methods approach to gain a comprehensive understanding of the topic.

AREA OF THE STUDY

The study is taken in and around Coimbatore city.

PERIOD OF THE STUDY

The study has been under taken December 2023 to February 2024

SOURCES OF DATA

The data was collected by both primary data and secondary data.

Primary Data - Primary data have been collected by questionnaire among youth.

Secondary Data-Secondary data have been collected from journals, magazines, books.

SAMPLING TECHNIQUE

A purposive sampling technique has been used to collect respondents for study.

SAMPLE SIZE

A total of 170 respondents have been considered as sample respondents for the study.

STATISTICAL TOOLS USED

The following statistical tools have been used to analyse the primary data collected

1 Simple Percentage Analysis

2 One way Anova

3 Independent t-test

4 Friedman rank test

5 Chi-square test

LIMITATIONS

- The survey conducted to gather insights on green vehicles was restricted to a sample size of only 170 respondents.
- This sample size is relatively small compared to the entire population interested in or affected by green vehicle adoption.
- Some studies may only examine short-term effects or benefits of electric vehicles, overlooking long-term impacts on infrastructure, energy systems, and the environment

CHAPTER SCHEME

The present study is organized into five chapters and they are described briefly as follows:

CHAPTER1:INTRODUCTION OF THE STUDY

This chapter deals with Introduction, Statement of the problem, Scope of the Study, Objective of the Study, Research Methodology, Limitations and Chapter Scheme.

CHAPTER 2: REVIEW OF LITERATURE

This chapter encompasses the Review of various research works undertaken in the topic related to the present study.

CHAPTER 3: OVERVIEW OF THE STUDY

This chapter presents Overview the of the study

CHAPTER 4: DATA ANALYSIS AND INTERPRETATION

This chapter deals with the Analysis and Interpretation of the primary data collected for study purpose.

CHAPTER 5: FINDINGS, SUGGESTIONS, AND CONCLUSIONS

This chapter deals with Findings of the study, Suggestions, and Conclusion of the study.

CHAPTER 2

REVIEW OF LITERATURE

The review of literature of Electric vehicles spans multiple domains, including technological innovation, environmental considerations, consumer trends, policy impacts, and infrastructure development. Research in this field has examined advancements in battery technology, emissions reductions, consumer preferences, policy effectiveness, and infrastructure challenges. These studies provide valuable insights into the multifaceted aspects of transitioning to electric vehicles.

REVIEW OF LITERATURE

UDIT CHAWLA , RAJESH MOHNOT , VARSHA MISHRA , HARSH VIKRAM

SINGH AND AYUSH KUMAR SINGH, (2023), examined "Factors Influencing Customer Preference and Adoption of Electric Vehicles in India: A Journey towards More Sustainable Transportation". The study was carried out with 150 respondents and ANOVA tool was used for analyzing the data. The study aims to assess customer satisfaction with green vehicles, focusing on factors such as performance, affordability, and environmental impact. The findings of the study identified range anxiety as a prominent concern among prospective EV buyers in India. Participants expressed apprehension about the limited driving range of EVs and the availability of charging stations, particularly for long-distance travel.

DR. V. VIDHYA A, RENUGA DEVI. R B, 2023, the research paper entitled "A Study on Consumer Preference and Satisfaction towards Electric vehicles with Reference to Coimbatore City", has been made with the objective to study the behavior and attitude of the electric vehicle. The study has been carried out with 163 respondents and Chi Square tool was used for analyzing the data. The finding of the study found that there exists a significant awareness and knowledge gap among consumers in Coimbatore regarding electric vehicles (EVs). Many respondents demonstrated limited understanding of EV technology, available models, and associated benefits.

N. DEEPA, DR. S. PANEER SELVAM, 2023, observed "A Study about the Intension to Purchase Electric Two-Wheelers in the State of Tamil Nadu" was made with the objective to identify the various factors that affects the customer satisfied towards the electric vehicle. The study was carried out with 150 respondent who purchases the electric two vehicle in state of Tamil nadu. The findings of the study found that a significant proportion of respondents in Tamil Nadu expressed strong environmental concerns, which influenced their intention to purchase electric two-wheelers. The result shows that the main affecting factors towards the
electric vehicle have been identified as availability of electric vehicle company's like ola, ather, TVs, revolte, hero, etc… .

MS. DHIVYA PRIYA.T, DR.BOOPATHI.C, 2023, analyzed that entitiled "consumer's awareness and satisfaction towards electric bikes - with respect to coimbatore city" The study has been carried out with 117 respondents and One way Anova and Mean Score ranking tool for analysing the data. The study highlighted significant factors influencing consumer attitudes and satisfaction regarding electric bikes. The findings of the study is range anxiety emerged as another significant factor affecting consumer satisfaction with electric bikes in Coimbatore.

HARINATH E AND R SURENDHER, 2023, the research paper found that "A Study on Customer Perception toward Electrical Vehicle" was made with the objective to analyze the customer perception towards electric vehicle. The study has been carried out with 114 respondents and one way Anova tool has been used to analysing the data. The findings of the study is many consumers in Coimbatore are increasingly conscious of environmental issues such as air pollution and climate change. As a result, they perceive EVs as a more environmentally friendly transportation option compared to traditional vehicles powered by fossil fuels.

DR R MUTHUKRISHN , PEREZHIL PRAKASH, NAVEEN RAJKUMAR , RANJITHVEL, AKHIL C, 2023, conducted "consumer perception towards electric vehicles" has been made with the objective to evaluate the customer perception towards EV. The study has been carried out with 162 respondents and one way Anova, Cross tabulation, Chi square , regression and correlation tool has been used to analyzing the data. The findings of the study suggests that consumers are increasingly inclined towards electric vehicles due to their perceived environmental benefits. Factors such as reduced emissions and lower carbon footprint compared to traditional vehicles are significant drivers of consumer preference for EVs.

Dr. N JEEVA, 2023, highlighted "A study of customer experience and behavioral intentions towards the purchase of electrical cars in Chennai" was made with the objective. The study has been carried out with 120 respondents and chi square has been used to analyzing the data. The finding of the study is Customers in Chennai exhibit a growing awareness of environmental issues, leading to a positive inclination towards electric cars due to their lower carbon footprint and reduced emissions compared to traditional combustion engine vehicles.

DR.N.PREMA,2023, investigated "customer attitude to the use of electric scooter in erode district" has been made with the objective to evaluate the customer attitude towards EV usage . The study has been carried out with 120 respondents, weighted score ranking has been used for analyzing the data. The research findings of the study highlights a positive attitude towards
electric scooters in Erode District, driven by their perceived environmental benefits and reduced carbon emissions compared to traditional scooters.

IMTHIYAZ AHMED M, DR. D. AYUB KHAN DAWOOD, 2022, assessed "influence of service quality on satisfaction among the consumers using electric vehicles in Chennai", has been made with the objective. The study has been carried out with 100 respondents. The present study aims on influence of service quality on Customer satisfaction of electric vehicles in Chennai. 94 consumers using electric vehicles in Chennai were selected for the study as the samples. This is a descriptive study and questionnaire is used as the study instrument of the study to collect the data.

M UKESH, M CHANDRA KUMAR AND R GANGAISELV, 2022, examined "A study on
consumer satisfaction of buying electric two wheelers in Coimbatore district of Tamil nadu" has been made with the objective to understand the purchasing behavior of customers satisfaction towards EV. With a sample size of 200 respondents, rank analysis using Kendall's W is used to analyzing the data. The findings of the study indicates that consumer satisfaction with purchasing electric two-wheelers in Coimbatore district of Tamil Nadu is influenced by factors such as product quality, range, charging infrastructure availability, and after-sales service, with a focus on the overall ownership experience.

M. PRABAHARAN, M. SELVALAKSHMI, 2022, scrutinized the "Customers Interest in Buying an Electric Car: An Analysis of the Indian Market", With a substantial sample size of 600 respondents, statistical tools including descriptive analysis, reliability testing, chi-square test, and correlation analysis the data. The findings of the study Consumers express interest in electric cars due to their perceived benefits, including lower operating costs, reduced emissions, and the availability of charging infrastructure, signaling a shift towards sustainable transportation solutions in the Indian market.

PROF. PRAVEEN KUMAR, MR. YASHWANTH, 2022, observed "A study on customer loyalty and satisfaction towards ola electric scooters in bengaluru" has been made with the objective The study has been carried out with 100 respondents. Chi square and one way anova tools and been used to analyzing the data. The findings of the study is the Customers express high levels of satisfaction with Ola's electric scooters, citing benefits such as ease of booking, responsive customer support, and a seamless riding experience, leading to repeat usage and positive word-of-mouth recommendations.

DR ANUPAMA K MALAGI1 , RAMYA S, 2022, studied "Consumer Awareness and Perception towards Electric Vehicles with Specific Reference to Bengaluru City". A chi-square test was employed, and the sample size consisted of 103 participants. The findings of the study
is Conducting surveys among Bengaluru residents to assess their awareness levels and perceptions towards electric vehicles, gathering quantitative data on factors such as knowledge about EV technology and willingness to consider EVs for future purchases.

ISHIKA RANJAN, SAWAN KUMAR JHA , SHUVAM MONDAL , 2022, highlighted the
"A study on Consumer Buying Behaviour towards Electric Vehicle" the study has been continued with the objective. The sample size was 50 and tools used for the study was chi square test and weighted average. The research study aims to observing consumer interactions and behaviors at electric vehicle dealerships, test drive events, and promotional activities to understand real-time consumer responses and preferences towards electric vehicles.

ARJUN MANOJ VAKIL, RITHWIK RAJEEV NAIR, VARNIKA DEVAN, DR. D
DIVYA PRABHA AND DR. VB MATHIPURANI, 2021, the research paper titled as "Analysing the consumer satisfaction towards electric vehicles with reference to Coimbatore district", has been made with the objective to understand the customer reference in Coimbatore city. The study has been carried out 150 respondents and the study utilized statistical tools such as the chi-square test to examine various aspects of customer reference in Coimbatore city. The findings of the study is understanding the interplay between service quality and consumer satisfaction in Coimbatore district will provide valuable insights for stakeholders aiming to promote electric vehicle adoption and enhance the overall consumer experience in the region.

SOUVIK ADHIKARY , NAMAN JALAN , NILESH ANUTE, 2022, examined the
"Customers' Perception about electric vehicles" the study has been carried out 100 respondents the research aimed to explore various aspects of customer perception regarding electric vehicles. Through surveys, interviews, and data analysis, the study thought to understand factors influencing customer attitudes, beliefs, and intentions towards electric vehicle adoption. The findings of the study is many customers perceive electric vehicles as environmentally friendly transportation options, appreciating their lower emissions and reduced carbon footprint compared to traditional gasoline vehicles.

DR.N.S.LISSY, DR.J.MAHALAKSHMI, 2022, accepted the "Consumer Perception of Electric Vehicles in India", with the objective of find of knowledge and attidude towards the electric vehicle. The study has been continued with the 212 respondent. Rank correlation was used for the purpose of the study. The findings of the study is consumer perception of electric vehicles in India is increasingly positive, with growing awareness of environmental concerns and the need for sustainable transportation solutions driving interest in EVs as eco-friendly alternatives to conventional vehicles.

PRIYANSHU KUMAR, SHAHIL ALAM, PROF. DR. AVINASH RANA, 2022, assessed
the "consumer behaviour on electric vehicles". has been made with the objective to identify the key reason that attracts customers towards EV. The study has been carried out the 100 respondant. Through surveys, interviews, and data analysis, the research aimed to uncover insights into the motivations, preferences, and perceptions driving consumer behavior towards electric vehicles, providing valuable guidance for industry stakeholders and policymakers in promoting sustainable transportation solutions.

IMTHIYAZ AHMED M, DR. D. AYUB KHAN DAWOOD, 2022, the research paper titled the "factors influencing service quality of electric vehicles in chennai", has been made with the objective to identify the service quality of electric vehicle in Chennai. Through a comprehensive analysis, the study aimed to uncover the key factors that contribute to the overall service quality experience for electric vehicle users in the city.

ARJUN MANOJ VAKIL, RITHWIK RAJEEV NAIR, VARNIKA DEVAN, DR. D

DIVYA PRABHA AND DR. VB MATHIPURANI, 2021, attempted the paper "Analysing the consumer perceptions towards electric vehicles with reference to Coimbatore district", has been made with the objectives the study may also aim to evaluate the level of understanding among consumers regarding the environmental benefits of electric vehicles, analyze the perceived advantages and disadvantages of electric vehicles compared to traditional internal combustion engine vehicles, investigate the role of government policies and incentives in shaping consumer perceptions, and explore the influence of factors such as range anxiety, charging infrastructure availability, and vehicle affordability on consumer decision-making processes.

DR.J.VICTOR CHARLES, 2021, assessed the "study on consumer's perception towards e- vehicles in madurai", has been made with the objective . The study has been carried out the 200 respondant. to explore various aspects such as awareness, attitudes, and preferences related to e- vehicles. Through surveys, interviews, and data analysis, the study aimed to uncover insights into factors influencing consumer perceptions and provide valuable recommendations for promoting the adoption of electric vehicles in Madurai.

DR.K.SELVARAJU,Mr.C.S.DARSHAN,Mr.S.DHARMESHWARAN,

Mr.S.DILEEPKUMAR, 2021, the research paper entitled "a study on customer satisfaction on electric vehicle buying. The objective of the study likely revolves around examining the factors influencing customer satisfaction when purchasing electric vehicles. Through surveys, interviews, and data analysis, the research aimed to identify key determinants affecting customer satisfaction levels throughout the electric vehicle purchasing process.

VINOTH , PARTHIBAN, 2021, stated "A Study on Customer Perception towards Electric Two-Wheelers in Chennai", has been made with objectives. The study has been carried out the 120 respondent and the research employed statistical tools such as descriptive statistics, chi-square, and one-way ANOVA to analyze the data.The objectives likely included understanding customer attitudes, preferences, and concerns regarding electric two-wheelers, as well as identifying factors influencing their adoption. Through this study, valuable insights were gained to inform strategies for promoting electric two-wheeler usage and addressing consumer needs effectively in Chennai.

DR. D. SIVASAKTHI, GEETHANJALI.P, 2020, assessed "A study on customer satisfaction towards ampere electric bike with special reference to coimbatore city", has been made with the objectives. The study has been carried out the 120 respondent. The research sought to identify factors influencing customer satisfaction, such as performance, design, affordability, and after- sales service. Through surveys, interviews, and data analysis, the study aimed to provide insights into customer preferences and perceptions, ultimately contributing to the improvement of electric bike offerings and customer experiences in Coimbatore.

AAKARSH RAM, 2020, highlighted the "Consumer Behavior towards Buying Electric Vehicles", the study has been continued with the objectives and 60 respondents related to EV. And analyzing the awareness levels of consumers regarding electric vehicle technology and infrastructure, assessing the influence of government policies and incentives on consumer purchase decisions, and exploring the role of marketing strategies in promoting electric vehicle adoption.

IMTHIYAZ AHMED .M1 & DR. D. AYUB KHAN DAWOOD, 2020, the research paper

entitled "Customer Satisfaction of Indian Electric Cars in the Light of Green Marketing Strategies", and made with the objectives. The study has been carried out 100 respondents. The findings of the study is explores how strategies promoting environmental benefits influence customer satisfaction levels, shedding light on the effectiveness of green marketing initiatives in shaping consumer attitudes towards electric vehicles in India.

J. SELVA AND R.ARUNMOZHI, 2020, had conducted the study "Consumer preference on electric vehicles and its business in the global market ", and made with the objectives. The study has been carried out 150 respondents. The findings of the study is analysis the consumer preference on electric vehicles (EVs) and its business in the global market examines factors influencing consumer choices and market dynamics. It delves into trends, preferences, and challenges impacting the EV industry worldwide, providing insights into the demand for electric vehicles and strategies for businesses to thrive in the global EV market.

SAJAN ACHARYA, 2019, studied "consumer perception towards electric vehicle industry- a study on the role of electrical vehicles in environmental sustainability", and made with the objectives. The sample size was 100 and tools used for this study i.e. Percentage Analysis, Chi- square test, correlation analysis. The findings of the study is explores how consumers perceive EVs as contributing to environmental sustainability and assesses the impact of this perception n consumer attitudes and behaviors towards EV adoption.

S SELVI, 2017, examined "A study on customer satisfaction towards electric bikes with special reference to Coimbatore city", and made with the objectives. The study has been carried out 200 respondents, chi square has been used to analyzing the data. The research study aims to provide valuable insights for electric bike manufacturers and policymakers to improve product offerings and infrastructure support, fostering greater adoption of electric bikes in Coimbatore city.

J. VICTOR CHARLES, DR. C. KATHIRAVAN, C. VELAUDHAM, 2016,analyzed the

study "Customer Satisfaction towards C- Segment Cars in Chennai City", and made with the objectives. The study has been carried out 680 respondents, and the tools used was percentage and chi square test. The research study aims to examining factors such as vehicle performance, comfort, reliability, and after-sales service to understand overall ownership experiences and to provide insights for automakers and dealerships to enhance product quality, service offerings, and customer satisfaction in the competitive C-segment car market of Chennai city.

RESEARCH GAP

Identifying the research gap in the study of consumer preference and satisfaction towards green vehicles reveals a area where further investigation is warranted. While existing literature extensively examines various factors influencing consumer behavior in the context of green vehicles, there remains a notable absence of comprehensive studies that integrate these factors within a holistic framework. Specifically, while studies have explored individual determinants such as environmental awareness, perceived benefits, and vehicle attributes, there is a lack of research that systematically analyzes the interplay between these factors and their collective impact on consumer decision-making processes. Moreover, the evolving landscape of technological advancements, policy interventions, and societal shifts necessitates a deeper understanding of how these external factors influence consumer attitudes

and behaviors towards green vehicles over time. Conducting comprehensive life-cycle assessments of green vehicles to assess their overall environmental impact compared to conventional vehicles is another area that warrants attention. Ultimately, addressing these research gaps can provide valuable insights for policymakers, industry stakeholders, and researchers, facilitating the widespread adoption of green vehicles and contributing to a more sustainable future for transportation.

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CHAPTER3

OVERVIEW OF THE STUDY

ABOUT ELECTRIC VEHICLE

An EV includes both a vehicle that can only be powered by an electric motor that draws electricity from a battery (all-electric vehicle) and a vehicle that can be powered by an electric motor that draws electricity from a battery and by an internal combustion engine (plug-in hybrid electric vehicle). Electric vehicles (EVs) are revolutionizing the automotive industry with their eco-friendly design and innovative technology. Comprising models like Battery Electric Vehicles (BEVs), Plug-in Hybrid Electric Vehicles (PHEVs), and Hybrid Electric Vehicles (HEVs), EVs offer numerous advantages over traditional gasoline-powered cars. These include zero tailpipe emissions, lower operating costs, smoother acceleration, and reduced dependence on fossil fuels

Electric vehicles (EVs) have emerged as a transformative force in the automotive landscape, presenting a compelling solution to environmental concerns and the need for sustainable transportation. Offering a diverse range of options including Battery Electric Vehicles (BEVs), Plug-in Hybrid Electric Vehicles (PHEVs), and Hybrid Electric Vehicles (HEVs), EVs are reshaping how we think about mobility. With zero tailpipe emissions, EVs contribute to cleaner air and reduced greenhouse gas emissions, addressing critical environmental challenges. Beyond environmental benefits, EVs boast lower operating costs and superior performance, thanks to their electric motors' instant torque and smoother acceleration.

HISTROY OF ELECTRIC VEHICLES

The history of electric vehicles (EVs) dates back to the early 19th century when inventors began experimenting with electric power for transportation. In the early 1800s, inventors such as Robert Anderson and Thomas Davenport created some of the earliest electric vehicles, primarily small-scale models like toy cars and electric locomotives. In 1835, Thomas Davenport built the first practical electric vehicle—a small locomotive powered by a primitive electric motor. Electric vehicles gained popularity in the late 19th and early 20th centuries, especially among affluent city dwellers. They were preferred for their quiet operation and ease of use compared to early internal combustion engine vehicles, which were loud and required manual cranking to start. During this time, electric vehicles were commonly used as taxis and delivery vehicles in cities like New York and London. The 21st century witnessed significant advancements in battery technology, making electric vehicles more practical and affordable. Companies like Tesla emerged as leaders in the EV market, producing high- performance electric vehicles with long ranges.

GROWTH OF ELECTRIC VEHICLES

The growth of electric vehicles (EVs) has surged in recent years, driven by advancements in
technology, supportive government policies, increasing environmental consciousness, expanding infrastructure, automaker investment, and growing consumer demand. With improvements in battery technology, EVs offer competitive ranges and performance compared to traditional vehicles, while government incentives and regulations incentivize their adoption. Environmental concerns, including air pollution and climate change, have spurred interest in EVs as a cleaner alternative to fossil fuel- powered cars. The development of charging infrastructure, both public and private, has alleviated concerns about range anxiety and accessibility. Automakers are heavily investing in electric vehicle development, expanding the range of models available to consumers. As a result, EVs are rapidly becoming a mainstream choice for drivers globally, marking a significant shift towards sustainable transportation.

TYPES OF ELECTRIC VEHICLE

- **Battery electric vehicles (BEVs):** BEVs run entirely on electric power stored in high-capacity batteries. They do not have an internal combustion engine, relying solely on electric motors. BEVs produce zero tailpipe emissions, making them environmentally friendly options.
- **Plug-in Hybrid electric vehicles (PHEV):** PHEVs have both an electric motor and an internal combustion engine. They can be charged via an external power source (plug-in) and also have a gasoline engine for extended range.
- **Hybrid electric vehicles (HEV):** HEVs combine an internal combustion engine with an electric motor and a small battery pack. Unlike PHEVs, HEVs cannot be charged externally; they rely on regenerative braking and the internal combustion engine to recharge their batteries. HEVs provide improved fuel efficiency and lower emissions compared to traditional gasoline vehicles but have limited electric-only driving range.
- **Fuel cell electric vehicles (FCEV):** FCEVs use hydrogen gas to generate electricity through a fuel cell stack, powering an electric motor. They emit only water vapor as exhaust, making them zero- emission vehicles. FCEVs offer longer driving ranges and shorter refueling times compared to battery-electric vehicles.

ADVANTAGES OF ELECTRIC VEHICLES

Electric vehicles (EVs) offer several advantages over traditional internal combustion engine vehicles. Firstly, they are environmentally friendly, producing zero tailpipe emissions when powered solely by electricity, thereby reducing air pollution and mitigating climate change. Additionally, EVs typically have lower operating costs due to cheaper electricity compared to gasoline, as well as fewer moving parts, resulting in reduced maintenance expenses. Moreover, electric motors provide instant torque, delivering smooth and responsive acceleration, contributing to an enjoyable driving experience. EVs also contribute to energy independence and security, as electricity can be generated from diverse renewable sources, reducing dependence on fossil fuels. Furthermore, advancements in
battery technology have led to improvements in range and charging infrastructure, addressing concerns about range anxiety and making EVs more practical for everyday use. Overall, the advantages of electric vehicles encompass environmental, economic, and performance benefits, making them an increasingly attractive option for consumers and policymakers alike.

DISADVANTAGES OF ELECTRIC VEHICLES

While electric vehicles (EVs) offer numerous advantages, they also present certain disadvantages that may influence consumer decisions. Firstly, EVs often come with higher upfront costs compared to traditional gasoline-powered vehicles, primarily due to the expense of battery technology. Despite potential savings in operating costs over the vehicle's lifetime, the initial purchase price can be a deterrent for some buyers. Additionally, EVs may face limitations in driving range and charging infrastructure, leading to concerns about range anxiety, particularly for long- distance travel. Although charging infrastructure is expanding rapidly, it may still be less ubiquitous than gasoline stations in certain areas, making it inconvenient for some drivers. Furthermore, charging times for EVs can be longer compared to refueling a gasoline vehicle, especially for standard charging methods, which may not suit everyone's lifestyle or travel needs. Finally, while EVs produce zero tailpipe emissions, the environmental impact of battery production and disposal must be considered, as battery manufacturing involves resource extraction and energy-intensive processes. Despite these challenges, ongoing advancements in technology and infrastructure are gradually addressing these drawbacks, making electric vehicles increasingly viable and appealing alternatives to traditional combustion-engine cars.

FEATURES OF ELECTRIC VEHICLES

Electric vehicles (EVs) boast a range of innovative features that set them apart from traditional combustion-engine vehicles. Firstly, they are powered by electric motors, providing instantaneous torque for smooth and responsive acceleration. EVs typically offer regenerative braking systems, which capture kinetic energy during braking and convert it into electricity to recharge the battery, enhancing energy efficiency and extending driving range. Many EVs come equipped with advanced battery management systems, optimizing performance and prolonging battery life. Additionally, EVs often feature smart connectivity options, enabling remote monitoring and control of vehicle functions via smartphone apps. Furthermore, EVs may incorporate cutting-edge safety technologies, such as collision avoidance systems and pedestrian detection, enhancing driver and passenger safety.

ELECTRIC TWO WHEELERS

Electric two-wheelers, often referred to as electric motorcycles or electric scooters, have gained significant popularity in recent years due to their eco-friendliness, efficiency, and cost-effectiveness. Some features of electric two wheelers,
Electric motor: The heart of an electric two-wheeler is its electric motor, which provides propulsion
by converting electrical energy from the battery into mechanical energy to drive the wheels.

Battery: Electric two-wheelers are powered by rechargeable batteries, typically lithium-ion, which store the electrical energy needed to operate the motor. Battery capacity and type affect the vehicle's range, performance, and charging time.
Regenerative Braking: Many electric two-wheelers feature regenerative braking systems that capture kinetic energy during braking and convert it into electrical energy to recharge the battery, improving efficiency and extending range.
Charging port: Electric two-wheelers come with a charging port, usually located on the vehicle's body, where the battery can be plugged in for charging. Charging ports may support various charging standards, such as AC charging from a standard outlet or DC fast charging.
Riding modes: Certain electric two-wheelers come equipped with multiple riding modes that allow riders to adjust performance characteristics such as power output, throttle response, and regenerative braking settings to suit different riding conditions or preferences.
Smartphone connectivity: App-based connectivity is a must-have feature of modern electric bikes. Apps bring a whole new kind of sophistication to the overall EV ride experience. EVs, for instance, can be entirely operated by users through their smartphone app. Here are some of the things a user can do through the Yulu app:

- Unlock a bike through the in-app menu and start their ride.
- Check the ride details (location, time, pricing etc.).
- See the list of rental packs.
- View in-app nudges for safe driving.
- Contact customer support for any issues.

Fast charging: Some models offer fast-charging capabilities, allowing for quick replenishment of the battery during short breaks or at charging stations.

Storage options: Many electric scooters offer storage compartments, such as under-seat storage or front/rear baskets, for carrying personal belongings or groceries

ELECTRIC FOUR WHEELERS

Electric four-wheelers, also known as electric cars or electric vehicles (EVs), have gained significant attention in recent years as a sustainable alternative to traditional gasoline-powered cars. Here are some key aspects of electric four-wheelers.

Remote starting: Many EVs with connected smartphone apps can be remote started to allow the
cabin to heat or cool before you slide back inside. While many petrol cars can do the same, they can produce emissions while sitting idle and create a hazard for closed environments without much ventilation (such as garages) - one reason Toyota limits the remote idle time to 10 minutes. No such issues with an EV. Dial up that toasty warmness – and even switch on the seat and steering wheel heating as well while you're at it.

Onboard charger*:* To charge the traction battery, the *onboard charger* converts incoming AC power from the charge port to DC power.

Charge port*:* To *charge* the traction battery pack, the vehicle can attach to a charging cable using the ***charge port***. It connects the electric vehicle to an external supply. It charges the battery pack. The *charge port* is sometimes located in the front or rear part. The charging port links the electric car to a power source from outside. · DC-DC Converter: The traction battery pack provides a steady voltage.

Controller: Power electronics *controller:* Controlling the electric traction motor's speed and torque, the power electronics *controller* regulates the flow of electrically. the operation of an electric vehicle is determined by the power electronics *controller.*

Technology and features: Electric cars often come equipped with advanced features and technology, including digital instrument clusters, touch screen infotainment systems, connectivity features, driver assistance systems, and autonomous driving capabilities. These features enhance comfort, convenience, and safety for drivers and passengers.

Power inventor: The power inverter converts DC power from the battery into AC power to drive the electric motor. It plays a crucial role in regulating the motor's speed and torque.

Smart connectivity: Many electric vehicles come equipped with advanced connectivity features, such as smartphone integration, wireless charging pads, and in-car Wi-Fi hotspots. These features allow drivers and passengers to stay connected, access navigation systems, stream media, and control vehicle functions remotely through mobile apps.

Climate control: Electric vehicles often include advanced climate control systems with features such as pre-conditioning, which allows drivers to preheat the interior cabin while the vehicle is still plugged in, maximizing comfort and range in extreme weather conditions.

CHAPTER 4

ANALYSIS AND INTERPRETATION

Analysis involves systematically breaking down complex information into smaller,
manageable parts, identifying patterns, relationships, and connections within the data to understand its structure and components. This process includes organizing, comparing, and contrasting elements to reveal underlying trends or themes. Interpretation, on the other hand, assigns meaning to the analyzed data, giving context, and explaining the significance of the findings. It involves drawing inferences, making judgments, or providing explanations based on the analysis to understand the implications of the data in a specific context. In summary, analysis dissects information, while interpretation provides meaning and understanding, both crucial for gaining valuable insights and making informed decisions based on available data.

STATISTICAL TOOLS USED FOR THE STUDY

Statistical tools are techniques and methods used to analyze data in order to draw meaningful conclusions, make predictions, and understand relationships between variables. Here are some commonly used statistical tools

- Simple percentage Analysis
- One way Anova
- Independent t-test

- Friedman rank test

- Chi-square analysis

SIMPLE PERCENTAGE ANALYSIS

Simple percentage analysis refers to a method used to analyze data by expressing a part of a whole as a percentage. It involves comparing individual values or categories to the total value and expressing the relationship between them as a percentage. This type of analysis is commonly used in various fields such as finance, economics, statistics, and business to understand proportions, trends, or changes within a dataset

FORMULA

$$\text{Percentage} = \frac{\text{No of respondent}}{\text{Total No of Respondent}} 100$$

CHI-SQUARE ANALYSIS

The chi-square statistics, you compare it to the critical value from the chi-square distribution with degrees of freedom determined by the number of categories and the sample size. If the calculated chi-square value exceeds the critical value, then you reject the null hypothesis, indicating that there is a significant association between the variables. If it doesn't exceed the critical value, you fail to reject the null hypothesis, suggesting no significant association.

$$\chi^2 = \Sigma (O_i - E_i)^2 / E_i$$

Where, O=Observed values

E = Expected values

ONE WAY ANOVA

ANOVA (Analysis of Variance) is a statistical method used to compare the means of two or more groups of data. It is a parametric test that assumes the data are normally distributed and have equal variances. ANOVA is commonly used in experimental studies to compare the means of different treatment groups or to compare the means of a continuous variable across different categorical variables. It is also used in observational studies to compare the means of a continuous variable across different levels of a categorical variable, such as gender or age group.

INDEPENDENT t-TEST

T-test is a statistical method used to determine if there is a significant difference between the means of two groups of data. It is a parametric test that assumes the data are Normally distributed and have equal variances. The t-test takes into account the size of the samples, the variability within each group, and the difference between the means of the two groups. It calculates a t-value, which is compared to a critical value from a t-distribution to determine if the difference in means is statistically significant or Not. T-tests are commonly used in scientific research and data analysis to compare the means of two groups of data and to determine if there is a significant difference between them.

FRIEDMAN RANK TEST ANALYSIS

The Friedman Test is a non-parametric statistical test used to analyse and compare the differences among three or more groups of related samples. It is similar to the one-way ANOVA test. The Friedman test ranks the observation within each group and then calculate the average rank for each group. The test then compares the average ranks of the groups to determine if there are any significant differences among them.

DEMOGRAPHIC POFILE OF RESPONDENTS – SIMPLE PERCENTAGE ANALYSIS

.TABLE 4.1.1

AGE OF THE RESPONDENTS

Age	**No of Respondent**	**Percentage**
Below 30	**133**	**78.2**
31 – 40	20	11.8

41 – 50	11	6.5
Above 50	6	3.5
Total	**170**	**100.0**

Source: primary data

INTERPRETATION

From the above table it is clear that among 170 respondent, the highest of 78.2 percentage of the respondents belongs to age group of below 30 years, 11.8 percentage of the respondents belongs to age group of 31-40 years, 6.5 percentage of the respondents are belongs to the age group of 41-50 years, the lowest of 3.5 percentage of respondents belongs to the age group of above 50 years.

Majority of the respondents belongs to the age group below 30 years.

TABLE 4.1.2

GENDER OF THE RESPONDENTS

Gender	No of Respondent	Percentage
Male	64	37.6
Female	**106**	**62.4**
Total	**170**	**100.0**

Source: Primary data

INTERPRETATION

From the presented table, it's evident that out of 170 respondents, the data reveals that 62.4 percentage of the respondent were female, while 37.6 percentage of the respondent were male.

Majority 62.4 percentage of the respondents were female.

TABLE 4.1.3

MARITAL STATUS OF THE RESPONDENTS

Marital status	No of Respondent	Percentage
Married	50	29.4
Unmarried	**120**	**70.6**
Total	**170**	**100.0**

Source: Primary data

INTERPRETATION

From the displayed table, it's clear that among the 170 respondents, 29.4 percentage of the respondent are married, while 70.6 percentage of the respondent are unmarried.

The majority70.6% percentage of the respondent are unmarried

TABLE 4.1.4

EDUCATION LEVEL OF THE RESPONDENTS

Education level	No of Respondent	Percentage
High school	16	9.4
UG degree	**113**	**66.5**
PG degree	34	20.0

Professional	6	3.5
No formal education	1	0.6
Total	**170**	**100.0**

Source: primary data

INTERPRETATION

From the above table, It indicates the educational level of the 170 respondents. The highest of 66.5 percentage of the respondents have completed UG degree, 20.0 percentage of the respondents have completed PG degree 9.4 percentage of the respondents have completed the high school, 3.5 percentage of the respondents were professional and lowest percentage are the 0.6 percentage of No formal education.

Mostly 66.5 percentage of the respondents have completed the Undergraduate

TABLE 4.1.5 OCCUPATION OF THE RESPONDENTS

Occupation	No of Respondent	Percentage
Student	**90**	**52.9**
Employed	42	24.7
Business	17	10.0
Professional	8	4.7
Home maker	12	7.1
Retired	1	.6
Total	**170**	**100.0**

Source: primary data

INTERPRETATION

From the presented table, Among the 170 respondents, the 52.9 percentage of respondents are students, 24.7 percentage of respondents are employed, 10.0 percentage of respondents in business, 4.7 percentage of respondents are in professional positions, 7.1 percentage of respondents are homemakers, and 0.6 percentage of respondents are retired.

Majority 52.9 percentage of the respondents were students

TABLE 4.1.6

RESIDENTIAL AREA OF THE RESPONDENTS

Residential area	No of Respondent	Percentage
Urban	**86**	**50.6**
Sub-urban	41	24.1
Rural	43	25.3
Total	**170**	**100.0**

Source: primary data

INTERPRETATION

From the presented table, in terms of residential area, the distribution among respondents is as follows: 50.6 percentage are in urban areas, 24.1 percentage are in sub-urban areas, and 25.3 percentage are in rural areas.

Mostly 50.6 percentage of respondent were in the Urban area

TABLE 4.1.7 SOURCES OF INFORMATION

Source of information	No of Respondent	Percentage
Advertisement	48	28.2
Friend	**50**	**29.4**
Relative	28	16.5
TVs commercials	22	12.9
News articles	11	6.5

Blogs	11	6.5
Total	**170**	**100.0**

Source: primary data

INTERPRETATION

In the included table, represents the source of information about electric vehicle with 170 respondents, it has been found that 29.4 percentage of respondent select friend,28.2 percentage of respondent select advertisement, 16.5 percentage of respondent select relatives, 16.5 percentage of respondent select TV commercials and 6.5 percentage of respondent select news articles and blogs.

Majority 29.4 percentage of respondent were select friends.

TABLE 4.1.8

USAGE OF ELECTRIC VEHICLE

Usage of electric vehicle	No of Respondent	percentage
Less than 6 months	95	**55.9**
6 months - 1 years	49	28.8
1 year to 2 years	13	7.6
More than 2 years	13	7.6
Total	**170**	**100.0**

Source: Primary data

INTERPRETATION

From the displayed table, it represents the how long have you been using the EV, 55.9 percentage of respondent have used electric vehicles for less than 6 months, 28.8 percentage of respondent have used electric vehicles for 6 months to 1 year, 7.6 percentage of respondent have used EV for 1 year to 2 years, and 7.6 percentage of respondent have used EV for more than 2 years.

Mostly 55.9 percentage of respondent were used electric vehicle

TABLE 4.1.9 BATTERY CAPACITY

Battery capacity	No of Respondent	Percent
1200 watt motor	45	26.5
1500 watt motor	**67**	**39.4**
1800 watt motor	35	20.6
2000 watt motor	23	13.5
Total	**170**	**100.0**

Source: Primary data

INTERPRETATION

From the presented table, type of battery capacity the respondent used, 26.5 percentage of user prefer batteries with a capacity of 1200 watts, 39.4 percentage of user prefer batteries with a capacity of 1500 watt. 20.6 percentage of user prefer batteries with a capacity of 1800 watt, 13.5 percentage of user prefer batteries with a capacity of 2000 watt.

Majority of the 39.4 percentage of were the respondent of electric vehicle user prefer 1500 watt battery.

TABLE 4.1.10

BRAND OF ELECTRIC VEHICLE

Brand of electric vehicle	No of Respondent	Percentage
Ola	43	25.3
Ather	45	26.5
TVs	**49**	**28.8**
Revolte	19	11.2
Hero	14	8.2

Total	**170**	**100.0**

Source: Primary data

INTERPRETATION

From the included table, it is interpreted that 25.3 percentage of respondent are using Ola brand of electric vehicle, 26.5 percentage of respondent are using Ather brand of electric vehicle,

28.8 percentage of respondent are using TVs brand of electric vehicle, 11.2 percentage of respondent are using Revote brand of electric vehicle and remaining 8. percentage of respondent are using Hero brand of electric vehicle.

Majority of the respondent using TVs company with identifying the 28.8 percent.

STUDY VARIABLE OF THE RESPONDENT – SIMPLE PERCENTAGE ANALYSIS TABLE 4.1.11

ENHANCEMENT OF ELECTRIC VEHICLE

FACTORS	YES	PERCENTAGE
Longer battery life	120	70.6
Faster charging times	95	55.9
More charging stations	100	58.8
Lower purchase price	54	31.8
Better performance	71	58.2

Source: Primary data

INTERPRETATION

From the given table, Longer battery life (70.6%) A majority of the respondents prioritize longer battery life when choosing an electric vehicle, Faster charging times (55.9%) Although not the highest-ranking factor, a considerable portion of the respondents still consider faster charging times as an essential feature for electric vehicles, More charging stations (58.8%) A significant number of respondents are influenced by the availability of charging stations when deciding on an electric vehicle, Lower purchase price (31.8%) A relatively smaller percentage of respondents prioritize the lower purchase price of electric vehicles, Better performance (51.2%) of the respondents consider better performance as an influential factor for their preference in electric vehicles.

Mostly 70.6 percentage of respondents were select the longer battery life.

FACTORS WHICH INFLUENCE CONSUMER TO PREFER THE ELECTRIC VEHICLE– ANOVA, INDEPENDENT t-TEST

RELATIONSHIP BETWEEN THE AGE, EDUCATION LEVEL, OCCUPATION AND RESIDENTIAL AREA OF THE RESPONDENT AND THE FACTORS WHICH INFLUENCE CONSUMER TO PREFER THE ELECTRIC VEHICLE – DESCRIPTIVE STATISTICS

Descriptive statistics has been used to find the mean scores for the factors which influence consumer to prefer the electric vehicles. The factors which influence the consumer to prefer electric vehicles are measured by the ratings given by the respondents for statements at five-point scale. The mean ratings have been assigned as 5 for strongly agree, 4 for agree, 3 for neutral, 2 for disagree and 1 for strongly disagree.

H0: "There is no significance difference between age, education level, occupation and residential area of the respondent and the factors which influence consumer to prefer the electric vehicles".

TABLE 4.2.1

Relationship between the age, education level, occupation and residential area of the respondent and the factors which influence consumer to prefer the electric vehicle – Descriptive Statistics

Factors	N	Minimum	Maximum	Mean	Std. Deviation
Considering social trends	170	1	5	2.59	1.267
Lower running cost	170	1	5	3.09	1.193
Environmental impact and sustainability	170	1	5	3.36	1.180
Economic benefits	170	1	5	3.46	1.066
Economic sustainability	170	1	5	3.59	1.219
Environmental concern	170	1	5	3.35	1.194
Reasonable price	170	1	5	3.37	1.161
Esay availability	170	1	5	3.26	1.073
Product information	170	1	5	3.19	1.132

Eco friendly	170	1	5	3.43	1.327
Valid N (list wise)	170				

Source: computed data

INTERPRETATION

From the above table, it is interpreted that the factors which influence you to prefer the electric vehicle chosen by the respondents has the highest mean score, the mean value is obtained for the factor is Economic sustainability(3.59), Economic benefits(3.46), Eco friendly(3.43), Reasonable price(3.37), Environmental concern(3.35), Environmental impact and sustainability(3.36), Esay availability(3.26), Product information(3.19), Lower running cost(3.09), Considering social trends(2.59).

DEMOGRAPHIC FACTORS VS THE FACTORS WHICH INFLUENCE CONSUMER TO PREFER THE ELECTRIC VEHICLE – ANOVA

ANOVA test is used to find out if there is any significant difference between the respondents demographic factors of age, education level, occupation and residential area and the factors which influence consumer to prefer the electric vehicle at 5 percent level of significance. Higher score is the more factors influence the consumer of the statements. The mean score have been compared with the demographic factors to known the level of factors influencing the consumer to prefer the electric vehicle.

H_0: "There is no significance difference between age, education level, occupation and residential area of the respondent and the factors which influence consumer to prefer the electric vehicles"

TABLE 4.2.2

Demographic factors vs the factors which influence consumer to prefer the electric vehicle – ANOVA

Factors	Classification	No of Respondent	Mean	Standard Deviation	f	Sig.	S/NS
Age	**below 30**	**133**	**32.61**	**7.336**	.172	.915	NS
	31 – 40	20	32.25	10.597			
	41 – 50	11	33.91	8.203			
	above 50	6	34.00	6.164			
Education level	High school	16	32.75	3.958	.648	.629	NS
	UG degree	**113**	**32.37**	**7.821**			
	PG degree	34	33.79	8.116			
	Professional	6	31.00	11.967			
	No formal education	1	42.00	-			
Occupation	**Student**	**90**	**32.52**	**7.974**	1.439	.213	NS
	Employed	42	32.02	7.826			
	Business	17	32.41	8.675			
	professional	8	39.50	2.507			
	home maker	12	32.75	5.119			
	Retired	1	27.00	-			
Residential area	**Urban**	**86**	**33.55**	**6.892**			

	suburban	41	32.56	9.179	1.400	.249	NS
	Rural	43	31.14	7.803			

Source: Computed data

INTERPRETATION

The results of the ANOVA table shows that the F-value as 0.172 for age,0.648 for education level , 1.439 for occupation,1.400 for residential area and the factors which influence you to prefer the electric vehicles. The calculated P-value for age is 0.915, age,0.629 for education level , 0.213 for occupation,0.249 for residential. Since the P value at 5 per cent level of significance is more than

0.05 for the above factors, it can be concluded that there is no significant difference between demographic factors such as age, education level, occupation and residential area of the respondent and that the factors which influence you to prefer electric vehicle. **Hence the null hypothesis is accepted.**

DEMOGRAPHIC FACTORS VS THE FACTORS WHICH INFLUENCE CONSUMER TO PREFER THE ELECTRIC VEHICLE – INDEPENDENT t-TEST.

Independent sample t-test is used to find out if there is any significant difference between the respondents demographic factors of gender and marital status and the factors which influence consumer to prefer the electric vehicle at 5 percent level of significance. Higher score is the more factors influence the consumer of the statements. The mean score have been compared with the demographic factors to known the level of factors influencing the consumer to prefer the electric vehicle.

H0: "There is no significance difference between age gender and marital status of the respondent and the factors which influence consumer to prefer the electric vehicles".

TABLE 4.2.3

Demographic factors VS the factors which influence consumer to prefer the electric vehicle – Independent t-test.

Factors	classification	N	Mean	Std.deviation	t	sig	S/NS
Gender	Male	64	32.41	8.071	.878	.351	NS
	Female	106	32.88	7.572			
Marital status	Married	50	32.70	7.101	.446	.168	NS
	Unmarried	120	32.70	8.024			

Source: computed data

INTERPRETATION

It is ascertained to find the difference between gender and the factors influence you to prefer the electric vehicle. In the mentioned table (t = .878 , p = .351), (t = .446 , p = .168), there is no significant difference the gender, marital status and the factors influence you to prefer the electric vehicle since the significant value (p=.351), (p=.168) is greater than 0.05, **hence the null hypothesis gets accepted.**

DEMOGRAPHIC FACTORS AND SATISFACTION WITH THE PERFORMANCE OF ELECTRIC VEHICLE – ANOVA, INDEPENDENT t-test

RELATIONSHIP BETWEEN THE AGE, EDUCATION LEVEL, OCCUPATION AND RESIDENTIAL AREA OF THE RESPONDENT AND SATISFACTION WITH THE

PERFORMANCE OF ELECTRIC VEHICLE – DESCRIPTIVE STATISTICS

Descriptive statistics has been used to find the mean scores for satisfaction with the performance of electric vehicles. The satisfaction with the performance of electric vehicles are measured by the ratings given by the respondents for statements at five-point scale. The mean ratings have been assigned as 5 for highly satisfied, 4 for satisfied, 3 for neutral, 2 for dissatisfied and 1 for highly dissatisfied.

H0: There is no significance difference between age, education level, occupation and residential area of the respondent satisfaction with the performance of electric vehicle.

TABLE 4.3.1

Relationship between the age, education level, occupation and residential area of the respondent and satisfaction with the performance of electric vehicle – Descriptive Statistics

Factors	N	Minimum	Maximum	Mean	Std. Deviation
Maintenance requirement	170	1	5	2.70	1.380
Charging infrastructure	170	1	5	3.05	1.059
Driving range	170	1	5	3.30	1.114
Initial purchase price	170	1	5	3.38	1.015
Driving experience	170	1	5	3.54	1.192
Warranty coverage	170	1	5	3.37	1.130
Overall safety features	170	1	5	3.45	1.157
Performance expectancy	170	1	5	3.38	1.130
Valid N (list wise)	170				

Source: computed data

INTERPRETATION

From the above table, it is interpreted that satisfaction with the performance of electric vehicle chosen by the respondents has the highest mean score, the mean value is obtained for the factor is Driving experience (3.54),Overall safety features (3.45), Performance expectancy(3.38), Initial purchase price(3.38), Warranty coverage(3.37), Driving range(3.30), charging infrastructure(3.05) and maintance requirement(2.70).

DEMOGRAPHIC FACTORS VS SATISFACTION WITH THE PERFORMANCE OF ELECTRIC VEHICLE– ANOVA

ANOVA test is used to find out if there is any significant difference between the respondents demographic factors of age, education level, occupation and residential area and satisfaction with the performance of electric vehicle at 5 percent level of significance. Higher score is the satisfaction with performance of electric vehicles of the statements. The mean score have been compared with the demographic factors to known the level satisfaction with the performance of electric vehicle.

H0: "There is no significance difference between age, education level, occupation and residential area of the respondent and satisfaction with the performance of electric vehicle"

TABLE4.3.2

Demographic factors VS satisfaction with the performance of electric vehicle– ANOVA

Factors	Classification	No of Respondent	Mean	Standard Deviation	f	Sig.	S/NS
Age	**below 30**	**133**	**26.09**	**6.077**	.242	.867	NS
	31 – 40	20	25.70	7.190			
	41 – 50	11	27.27	3.636			
	above 50	6	27.33	5.241			
Education level	High school	16	26.50	4.817	.756	.555	NS
	UG degree	**113**	**25.73**	**5.981**			
	PG degree	34	27.26	6.307			
	Professional	6	26.00	8.672			
	No formal education	1	33.00	-			
	Student	**90**	**26.08**	**6.427**			

Occupation	Employed	42	26.10	5.843	.808	.545	NS
	Business	17	25.18	6.635			
	professional	8	30.13	2.949			
	home maker	12	26.00	3.861			
	Retired	1	24.00	-			
Residential area	**Urban**	**86**	**26.87**	**5.460**	1.296	.276	NS
	suburban	41	25.15	7.244			
	Rural	43	25.72	5.828			

Source: computed data

INTERPRETATION

The results of the ANOVA table shows that the F-value as 0.242 for age,0.756 for education level ,0.808 for occupation,1.296 for residential area and satisfaction with the performance of electric vehicles.. The calculated P-value for age is 0.867, age,0.555 for education level , 0.545 for occupation,0.276 for residential. Since the P value at 5 per cent level of significance is more than

0.05 for the above factors, it can be concluded that there is no significant difference between demographic factors such as age, education level, occupation and residential area of the respondent and satisfaction with the performance of electric vehicles. **Hence the null hypothesis is accepted.**

DEMOGRAPHIC FACTORS AND THE SATISFACTION WITH THE PERFORMANCE OF ELECTRIC VEHICLE – INDEPENDENT t-test

Independent sample t-test is used to find out if there is any significant difference between the respondents demographic factors of gender and marital status and satisfaction with the performance of electric vehicle at 5 percent level of significance. Higher score is the more satisfaction with the performance of electric vehicle of the statements. The mean score have been compared with the demographic factors to known the level satisfaction with the performance of electric vehicle.

H_0: There is no significance difference between gender, marital status of the respondent and satisfaction with the performance of electric vehicle.

TABLE4.3.3

Relationship between the gender, marital status of the respondent and the satisfaction with the performance of electric vehicle – independent t-test

Factors	classification	N	Mean	Std.deviation	t	sig	S/NS
Gender	Male	64	26.03	6.200	-.223	.823	NS
	Female	106	26.25	5.960			
Marital status	Married	50	27.10	4.678	4.703	.168	NS
	Unmarried	120	25.78	6.494			

Source: computed data

INTERPRETATION

It is ascertained to find the difference between gender and the factors influence you to prefer the electric vehicle. In the mentioned table (t = -.223, p = .823), (t = 4.703, p = .168), there is no significant difference the gender, marital status and the satisfaction with the performance of electric vehicle since the significant value (p=.823), (p=.168) is greater than 0.05, **Hence the null hypothesis gets accepted.**

DIFFICULTIES ENCOUNTERED WITH THE CONSUMERS SATISFACTION WHILE USING THE ELECTRIC VEHICLES - FRIEDMAN'S RANK TEST

TABLE4.4.1

The consumer satisfaction while using the electric vehicle

Factors	**Mean Rank**	**Rank**	**N**	**170**
Cost saving on fuel	3.85	III		
Vehicle performance	3.81	II		
Convenience of charging	**3.75**	**I**	Chi-square	251.737
Technological features	4.53	IV		
Enhanced warranty and after sales Support	4.92	V		
Safety features	5.44	VI	Df	8
Advanced technology	5.92	VII		
Interior comfort and space	6.34	VIII	Asymp.sig	<.001
Fuel efficiency	6.43	IX		

Source: computed data

INTERPRETATION

From the above mentioned table, convenience of charging (3.75, 1st rank), vehicle performance (3.81, 2nd rank), , the cost-saving on fuel (3.85, 3rd rank), technological features (4.53, 4th rank), enhanced warranty and after-sales support (4.92, 5th rank), safety features (5.44, 6th rank), advanced technology (5.92, 7th rank), and interior comfort and space (6.34, 8th rank), fuel efficiency (6.43, 9th rank), these rankings indicate that customer prioritize factors related to convenience, performance, and efficiency in their daily lives, similar to how consumers prioritize these aspects in vehicles. It's evident that the convenience of charging stands out as the primary consideration for customers when it comes to electric vehicles.

RELATIONSHIP BETWEEN DEMOGRAPHIC VARIABLE AND STUDY VARIABLE – CHI SQUARE

RELATIONSHIP BETWEEN AGE OF THE RESPONDENT AND BRAND OF THE

ELECTRIC VEHICLE

In this section, chi-square analysis is carried out to find the relationship between the demographic variable and study variable. Chi-square test is applied at 5% level of significance and the results are presented in tables with the suitable hypothesis and relevant interpretation.

H_0: There is no significant relationship between age and brand of the electric vehicle

TABLE 4.5.1

RELATIONSHIP BETWEEN AGE OF THE RESPONDENT AND BRAND OF THE ELECTRIC VEHICLE

Age	**Brand of the electric vehicle**					**Total**	**P value**	**sig**	**S/NS**
	Ola	**Ather**	**TVs**	**Revolte**	**Hero**				
Below 30	**32**	**38**	**40**	**11**	**12**	**133**			
31-40	3	4	6	6	1	20			
41-50	5	2	2	1	1	11	14.405	.276	NS
Above 50	3	1	1	1	0	6			
Total	**43**	**45**	**49**	**19**	**14**	**170**			

Source: computed data

INTERPRETATION

From the above table, Most of the respondent between below 30 that they are chooses the Ather electric vehicle company. The significant value = .276 >p. so accept the hypothesis. Therefore there is no significant between the age of the respondent and the electric vehicle company they have currently used.

RELATIONSHIP BETWEEN GENDER OF THE RESPONDENT AND BRAND OF THE ELECTRIC VEHICLE

In this section, chi-square analysis is carried out to find the relationship between the demographic variable and study variable. Chi-square test is applied at 5% level of significance and the results are presented in tables with the suitable hypothesis and relevant interpretation.
H0: There is no significant relationship between gender and brand of the electric vehicle

TABLE 4.5.2

Relationship between gender of the respondent and brand of the electric vehicle

Gender	**Brand of the electric vehicle**					**Total**	**P value**	**Sig**	**S/NS**
	Ola	**Ather**	**TVs**	**Revolte**	**Hero**				
Male	16	14	21	5	8	64	4.695	.320	NS
Female	**27**	**31**	**28**	**14**	**6**	**106**			
Total	**43**	**45**	**49**	**19**	**14**	**170**			

Source: computed data

INTERPRETATION

It appears that there is no significant correlation between the gender of the respondents and the Ather electric vehicle company they have chosen. The statistical value provided (.320>p) suggest that the hypothesis, which states that there is a relationship between gender and brand of electric vehicle.

RELATIONSHIP BETWEEN MARITAL STATUS OF THE RESPONDENT AND BRAND OF THE ELECTRIC VEHICLE

In this section, chi-square analysis is carried out to find the relationship between the demographic variable and study variable. Chi-square test is applied at 5% level of significance and the results are presented in tables with the suitable hypothesis and relevant interpretation.
H0: There is no significant relationship between marital status and brand of the electric vehicle

TABLE 4.5.3

Relationship between marital status of the respondent and brand of the electric vehicle

Marital status	**Brand of the electric vehicle**					**Total**	**P value**	**Sig**	**S/NS**
	Ola	**Ather**	**TVs**	**Revolte**	**Hero**				
Married	9	9	16	11	5	50	11.350	.063	NS
Unmarried	**34**	**36**	**33**	**8**	**9**	**120**			
Total	**43**	**45**	**49**	**19**	**14**	**170**			

Source: computed data

INTERPRETATION

From the displayed table, With a significant value of .023, which exceeds the predetermined threshold, the hypothesis is accepted. Consequently, there is no statistically significant relationship between the marital status of the respondent and their current choice of electric vehicle company.

RELATIONSHIP BETWEEN EDUCATION LEVEL OF THE RESPONDENT AND BRAND OF THE ELECTRIC VEHICLE

In this section, chi-square analysis is carried out to find the relationship between the demographic variable and study variable. Chi-square test is applied at 5% level of significance and the results are presented in tables with the suitable hypothesis and relevant interpretation.
H0: There is no significant relationship between education level and brand of the electric vehicle

TABLE 4.5.4

Relationship between education level of the respondent and brand of the electric vehicle

Education level	Brand of the electric vehicle					Total	P value	Sig	S/NS
	Ola	Ather	TVs	Revolt e	Hero				
High school	3	5	5	2	1	16	24.644	.076	NS
UG degree	**28**	**32**	**36**	**13**	**4**	**113**			
PG degree	11	5	6	4	8	34			
Professional	0	3	2	0	1	6			
No formal education	1	0	0	0	0	1			
Total	**43**	**45**	**49**	**19**	**14**	**170**			

Source: Computed data

INTEREPRETATION

From the referred table, Based on the analysis, it appears that a majority of respondents with an undergraduate degree prefer the TVs electric vehicle company. With a significant value of .076, which exceeds the predetermined threshold, the hypothesis is accepted. Therefore, there is no statistically significant relationship between the educational level of the respondent and their current choice of electric vehicle company.

RELATIONSHIP BETWEEN OCCUPATION OF THE RESPONDENT AND BRAND OF THE ELECTRIC VEHICLE

In this section, chi-square analysis is carried out to find the relationship between the demographic variable and study variable. Chi-square test is applied at 5% level of significance and the results are presented in tables with the suitable hypothesis and relevant interpretation.

H_0: There is no significant relationship between occupation and brand of the electric vehicle

TABLE 4.5.5

Relationship between occupation of the respondent and brand of the electric vehicle

Education level	Brand of the electric vehicle					Total	P value	Sig	S/NS
	Ola	Ather	TVs	Revolte	Hero				
Student	**21**	**27**	**27**	**9**	**6**	**90**	19.199	.509	NS
Employed	14	13	9	3	3	42			
Business	2	2	7	4	2	17			
Professional	2	2	3	0	1	8			
homemaker	0	0	1	0	0	1			
Retied	43	45	49	19	14	170			
Total	**43**	**45**	**49**	**19**	**14**	**170**			

Source: computed data

INTERPRETATION

From the above table, The significant value is 0.05 is lesser than the table value of 0.509(0.05>0.509). It appears that a majority of respondents are students. There is no statistically significant relationship between the occupation of the respondent and their current choice of electric vehicle company.

RELATIONSHIP BETWEEN RESIDENTIAL AREA OF THE RESPONDENT AND BRAND OF THE ELECTRIC VEHICLE

In this section, chi-square analysis is carried out to find the relationship between the demographic variable and study variable. Chi-square test is applied at 5% level of significance and the results are presented in tables with the suitable hypothesis and relevant interpretation.

H_0: There is no significant relationship between residential area and brand of the electric vehicle

TABLE 4.5.6

Relationship between residential area of the respondent and brand of the electric vehicle

Residential area	Brand of the electric vehicle					Total	P value	Sig	S/NS
	Ola	Ather	TVs	Revolte	Hero				
Urban	**23**	**22**	**22**	**10**	**9**	**86**			
Sub-urban	9	13	10	6	3	41			
Rural	11	10	17	3	2	43	5.542	.698	NS
Total	**43**	**45**	**49**	**19**	**14**	**170**			

Source: computed data

INTERPRETATION

From the above referred table, It has been noted that a majority of respondents reside in urban areas. However, the statistical analysis indicates that there is no substantial, statistically significant correlation between the respondents' residential areas (urban versus other) and their selection of electric vehicle company. With a p-value of 0.509, which is greater than the significance level of 0.05, the hypothesis suggesting a link between residential area and electric vehicle company preference is accepted.

CHAPTER5

FINDINGS, SUGGESTIONS &CONCLUSION

FINDINGS

PERCENTAGE ANALYSIS

Demographic factors - Percentage analysis

- The survey found that the majority of respondents, 78%, were under 30.
- Majority of 62% of the respondents were female.
- The survey revealed that the majority, constituting 70%, of respondents were not married.
- The majority of respondents, totaling 66.5%, were UG degree
- Majority of the respondents 52.9% are student
- The majority of respondents resided in urban areas, comprising 50.6% of the total.
- The primary source of information about electric vehicles for the majority of respondents was through friends, accounting for 29.4% of respondents.
- 60% of respondents reported using their electric vehicles for less than six months.
- 40% of respondent reported using electric vehicles with a battery capacity of 1500 watts.
- The TVS electric vehicle company was the preference for most of the respondent totaling 28.8%

The study variable – Percentage analysis

- 70% of the respondent were preferred the longer battery life.
- 56% of the respondent were favored the better charging stations.
- 59% of the respondent were preferred the more charging stations.
- 32% of the respondent were favored the lowest purchase price.
- 59% of the respondent were opted for the better performance.

OBJECTIVE 1 - FACTORS WHICH INFLUENCE THE CONSUMER TO PREFER THE ELECTRIC VEHICLES

ONE-WAY ANOVA

ANOVA was performed at 5 percent level of significance to analyze the significance difference between demographic factors and the factors which influence you to prefer the electric vehicle. The calculated P-value for age is 0.915, education level is 0.629, occupation is 0.213 and residential area is 0.249. It can be concluded that there is no significant relationship between demographic factors such as age, education level, occupation and residential area towards factors which influence you to
prefer the electric vehicle. Hence the null hypothesis is accepted.

INDEPENDENT SAMPLE t-TEST

There is no significant difference between (0.351) gender and the factors which influence you to prefer the electric vehicle. So null hypothesis is gets accepted and also there is no significant difference between (0.168) marital status and the factors which influence you to prefer the electric vehicle. So null hypothesis is gets accepted

OBJECTIVE 2 - SATISFACTION WITH THE PERFORMANCE OF ELECTRIC VEHICLE

ONE-WAY ANOVA

ANOVA was performed at 5 percent level of significance to analyze the significance difference between demographic factors and satisfaction with the performance of electric vehicle. The calculated P-value for age is 0.869, education level is 0.555, occupation is 0.545 and residential area is 0.276 It can be concluded that there is no significant relationship between demographic factors such as age, education level, occupation and residential area towards satisfaction with the performance of electric vehicle. Hence the null hypothesis is accepted.

INDEPENDENT SAAMPLE t-TEST

There is no significant difference between (0.823) gender and satisfaction with the performance of electric vehicle. So null hypothesis is gets accepted and also there is no significant difference between (0.168) marital status and satisfaction with the performance of electric vehicle. So null hypothesis is gets accepted.

DIFFICULTIES ENCOUNTERED WITH THE CONSUMERS SATISFACTION WITH WHILE USING THE ELECTRIC VEHICLES - FRIEDMAN RANK TEST

The respondents choose their preference and satisfaction towards electric vehicle. It is found that convenience of charging stands at rank first with the mean of 3.75, fuel efficiency stands at rank ninth with the mean of the mean of 6.43.

CHI-SQUARE ANALYSIS

Cross tabulation shows the significance value are above 0.05 and the chi-square analysis reveals that there is no significance relationship (.276) between age and the electric vehicle company do they currently used, there is no significance relationship (.320) between gender and the electric vehicle company do they currently used, there is no significance relationship (.063) between marital status and the electric vehicle company do they currently used, there is no significance relationship (.076) between education level and the electric vehicle company do they currently used, there is no significance relationship (.509) between occupation and the electric vehicle company do they currently used, there is no significance relationship (.698) between residential area and the electric vehicle company do they currently used. So the null hypothesis gets accepted.

SUGGESTIONS

- It's better to let the capacity run down to 10 or 20%, then recharge to around 80%.
- Electric vehicles are used only for short distance because of low battery capacity, so manufactures should concentrate on research and development to increase the capacity of electric vehicles.
- Plan your routes with charging stations to avoid running out of power. Charge during off-peak hours to save money and reduce strain on the grid. Use regenerative braking efficiently and avoid frequent fast charging to maintain battery health.
- The consumers perceives that the Electric vehicles will become mainstream within 5 years, so they are ready to adopt to the EV
- After conducting the research and looking into the current scenario, it is suggested to make a proper availability of infrastructure from the companies so that they can cater to the requirements of the EV Vehicles all over the country.

CONCLUSIONS

The current state of the EV Industry is in a great position with future prospects and huge market share as the quality of products has evolved a lot since the beginning of the EV in India. The perception of the Indian consumers have started to adopt technological improvements where Electric vehicles gain an upper hand over normal vehicle. The findings of the study established that there is good perception towards buying an electric vehicle. One of the factors limit the buying of an EV was lack of knowledge of customers towards electric vehicles. In this research as we got relevant information from the customers. So this research study concluded that the customers have a positive perception towards electric vehicles. The increasing awareness about environmental sustainability and the urgent need to reduce carbon emissions have significantly contributed to the growing interest in electric vehicles. Furthermore, government initiatives and policies aimed at promoting the adoption of EVs

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