IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

"Consumer Perception Towards Electric Two-Wheeler In Vadodara City"

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Abstact

India is joining the growing number of nations switching from gasoline-powered two-wheelers to electric two-wheelers due to rising fuel expenses and global warming. The popularity of electric two-wheeler is growing even in the Indian market. While there are many models and manufacturers of electric two-wheelers available in the Indian market, their growth is not as rapid as that of fuel vehicals. I will therefore investigate consumer behavior and preferences about electric two-wheeler. In order to better understand consumer perception and behavior, I want to survey people and ask them about a variety of topics, including age, gender, and awareness of electric vehicles.

Keywords: Electric two-wheeler automobiles, consumer perception.

Introduction of the study

An electric two-wheeler is one that runs on electricity rather than an internal combustion engine, which generates power by burning a mixture of fuel and gases. As a result, such a vehicle is viewed as a potential replacement for current generation automobiles in order to address issues such as rising pollution, global warming, depleting natural resources, and so on. Though the concept of electric vehicles has been around for a long time, it has gained a lot of attention in the last decade due to rising carbon footprints and other environmental impacts of fuel based vehicles.

Electric propulsion system-based electric vehicle. There is no use of internal combustion engine. Electricity serves as the sole energy source for everything. The key benefit is the electric motor's proposal system's great efficiency in power conversion. Large scale research and development projects have recently been reported in both academic and industry. There are also commercial vehicles available. Many nations offers incentives to users in the form of reduced tax rates or tax exemptions, free parking spaces, and free charging stations. The hybrid electric vehicle, on the other hand, is an alternative. In the most recent years, it has seen considerable application. Almost all automakers offer at least one hybrid electric vehicle variant.

Definition of Electric two-wheeler

An Electric two-wheeler is a type of electric two-wheeler that is completely electric. It consists of an e-scooter, an e-motorcycle, an e-moped, an e-bike, and a bicycle. It does not have an engine and does not run on fossil fuels such as gasoline, diesel, or compressed natural gas. Instead, it is powered and run entirely by electricity. In most cases, it has a rechargeable battery that stores electric energy and propels the two-wheeler. So, an Electric two-wheeler, E-scooter, or E-Motorcycle is a two-wheeler that runs entirely on electricity. Electric motorcycles and scooters are two or three-wheeled plug-in electric vehicles. A rechargeable battery provides power to one or more electric motors. Electric scooters differ from motorcycles in that they have a step-through frame rather than being straddled. Electric bicycles are similar vehicles that differ in that they can be propelled by the rides & pedalling in addition to battery propulsion. E- Scooters are electric scooters that allow the rider to stand.

Literature Review

Kunihiro (2005) Journal of the Eastern Asia Society for Transportation Studies article by Keiichi Satoh titled "Evaluation of Willingness to Buy a Low-Pollution Car in Japan" In order to suggest improvements to the introduction of low-pollution cars, this study clarifies consumer understanding on the purchase of a low-pollution vehicle. They conducted surveys in Sapporo to gauge public interest in purchasing a low-pollution vehicle. Sapporo residents are Environmental concern does not, however, result in the purchase of low-pollution vehicles.

Deekshu (2018) found that most of the customers were satisfied with the mileage of the Electric bikes and are convinced about the electric bike benefits and were willing to refer it to their friends. It was found that most of the customers are not satisfied with after-sales service. It shows that customers are dissatisfied with the sale service. It was found that a maximum number of the customers feel the speed of the electric bikes to be very low and were not satisfied with the current speed of the bikes. It was found that the non-availability of Electric bikes is also a reason for lower market share and consumers not purchasing them.

Ashish Aggarwal (2014) says that from the research it can Concluded that there is strong potential for growth in the Electric vehicle industry but it will take some time in India in Kickoff because Customers in India are not ready to pay the High price. Also they are very much concerned about the Security and quality aspect.

Dixon (2010) "Electric vehicle energy storage" This demonstrates some of the potential ways to shorten charging times and improve energy storage capacity. A comparison of various storage options, including chemical battery systems, ultra- capacitors, flywheels, and fuel cells is made, outlining the benefits and drawbacks of each.

Lingzhi Jin (2017) The early market growth for electric vehicles is still present, but a variety of obstacles are keeping them from becoming widely used. These obstacles include the new technology higher price, relative annoyance as compared to range and recharge durations, and consumer ignorance of the technology practicality and availability. This final point—often referred to as customer awareness is extremely important.

Pretty Bhalla (2018) analyzed electric vehicle manufacturers and the Government of India have to invest more in social acceptance of the vehicle by creating more infrastructural facilities, that the population is well aware of the environmental benefits. Moreover, the responsibility lies on the shoulders of the Government and manufacturers and by investing in the R&D of vehicles; studying the perception of customers towards the use of electric vehicles.

Chan, 2002) Environmental challenges force the transportation sector to move to more eco-friendly technologies Electric Vehicles are regarded as green transportation solution. The main focus of research is on batteries as it is the key component in making electric vehicles more environment friendly cost effective and drives the ev into use day to day life.

Kunal Dalvi (2020) evaluated that we have seen the proposed system using a hub motor at the front wheel is best as compared to the existing systems. The system introduced is an innovative step to increase the mileage of electric bikes. As, the cycle of charging and discharging continues, it helps in increasing the battery life. Due to extended battery life, the vehicle battery can run more than that of the existing system.

Jin and Slowik (2017) summarized various ways of creating customer awareness for electric vehicles and suggested that more and more awareness programs are required for customers of electric vehicles to make the concept working in the market. They also suggested that it is a great idea for all stakeholders to come together and create combined awareness activities with limited available resources. It is advisable to create a sustainable program for reaching a wide range of prospective customers, such programs with a wide range and right target can create a positive perception in electric vehicle potential customers (Halvorson, 2015). Kurani et. al. (2009) suggested that to assess the effectiveness, efficiency, and feasibility of electric vehicles awareness program it is important to work in proper Local context and resources. Li, S. et. al. (2015) suggested various ways of customer awareness like public events, exposure to electric vehicles from the fleet, Regional Planning, Consumer awareness program, youth education, and professional development, awards and recognitions, tourism, and others.

Wahid et al. (2011)Owning a green car makes it easier for citizens to uphold sustainability in the future by being more responsible and respectful of the environment. The purchase of green vehicles is still limited, and only a few automakers launched them to the Malaysian market in small production levels, despite the fact that they are the solution to lowering air pollution linked to climate change and resource scarcity. They still only make up a tiny portion of the passenger vehicle market. Giving into green marketing is currently a key commercial trend, but this is still new for Asian nations, particularly Malaysia.

Background of the study

There have been a number of studies on consumer perception of electric vehicles in general, but there is a limited amount of research specifically on electric two-wheelers. Some of the existing studies have found that consumers are generally positive about electric two-wheelers, but they also have some concerns about factors such as range, charging infrastructure, and price.

Consumer perception towards electric two-wheelers is a critical aspect for the sustainable growth of this emerging market. Research in this area aims to understand how consumers perceive electric two-wheelers in terms of factors such as performance, range, charging infrastructure, cost, and environmental impact. By exploring these perceptions, researchers seek to identify key drivers and barriers influencing consumer

adoption of electric two-wheelers. This understanding can contribute valuable insights for manufacturers, policymakers, and marketers to address concerns and enhance the overall acceptance of electric two-wheelers in the market.

Problem statement/Rationale of the study

The research problem focuses on investigating the key factors influencing consumer perception towards electric two-wheelers. This study aims to identify the critical aspects that shape consumer attitudes and preferences, including concerns related to performance, range anxiety, charging infrastructure, cost implications, and environmental considerations. Understanding these factors is crucial for manufacturers and policymakers to address barriers and promote the widespread adoption of electric two-wheelers. The research seeks to fill the gap in knowledge by providing insights into the specific challenges and opportunities associated with consumer perceptions, ultimately contributing to the development of effective strategies for the sustainable growth of the electric two-wheeler market.

Objective of the study

The primary objective of the Research is the need to understand the consumer point of view regarding electrical vehicles among people of Vadodara city.

To study the factors affecting purchase intention of electric vehicles.

To know the attitude of consumers towards Electric vehicles.

To identify the benefits about the use of Electric two-wheeler.

To study the barriers towards purchasing electric vehicle.

To study the factors influencing the buying behaviour of consumers perception towards Electric two-wheeler.

Hypothesis

H0: There is no significant impact of EV are expensive but can pay lower fuel costs with respect to willingness to buy EV in future.

H1: There is significant impact of EV are expensive but can pay for lower fuel costs with respect to willingness to buy EV in future..

Research Methodology

There are many types of research design used for research purpose but the research design which will be used for this study will be Descriptive research design. It is original primary data, for specific phase of research project. For this project I have used Questionnaire common research instrument or tool. For Secondary data I have used Books, Articles, Journals and Internet etc. Data collection was done through questionnaire method of survey. The questionnaire included open ended, dichotomous and multiple-choice questions. The questions were simple so that people can understand and answer to the questions. Some questions interrelated to make sure that, the answers received ware related to the area of research. Data collection was done through the medium of internet and social media services allowing to get better and

quick response from the units. Uses of internet for data collection was also increase diversification in answer and help us to get answer to multiple questions.

Research Design

Research Design is quantitative research that has been assessed by disseminating questionnaires to targeted research samples. To break down and audit the information, SPSS was utilized, which helps in surveying the information produced and deciding the outcomes.

Source of Data

To gather data on consumer perceptions towards electric two-wheeler in Vadodara City, you can consider multiple sources and research methods, depending on the scope and objectives of your study. Here are some potential sources of data:

• Surveys and Questionnaires

• Existing Studies and Reports

• Online Reviews and Social Media

Primary Data

Primary data was collected using survey method (Google Forms) by sending questionnaire to general public through mails and messages. The questionnaire where carefully considering the parameters of the study

Data Collection Method

Data is gathered using Primary survey method through questionnaire.

Population

The study population size is 160 respondents, who are falling in the age group of 18 and above of Vadodara (Gujarat), India.

Sampling Method

Probability sampling method – simple random sampling.

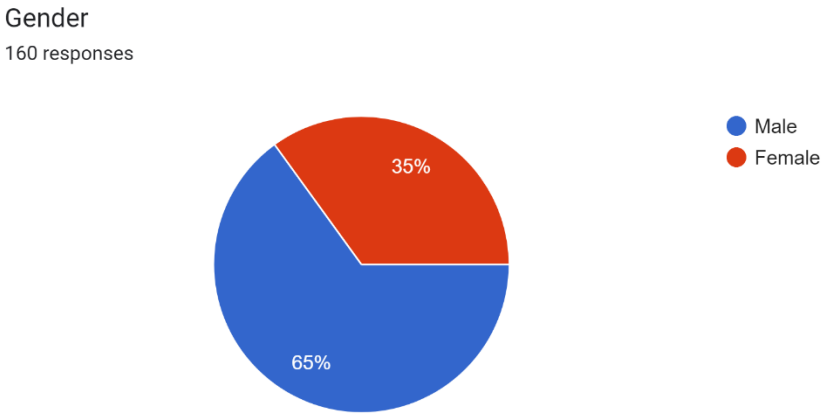
Sampling Frame

Consumer of Vadodara city aged 18 to 60 through email via google form survey.

Data Collection Instrument

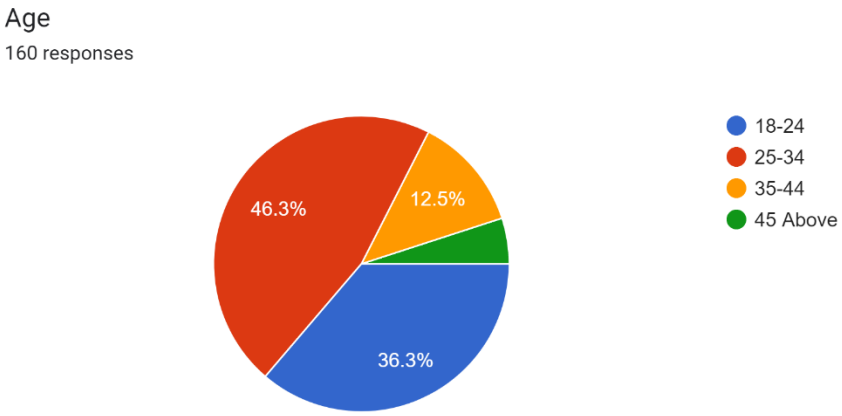
Questionnaire including Likert scale, close ended questions like rating scale/ranking scale and open ended question at the end.

Data analysis & Interpretation

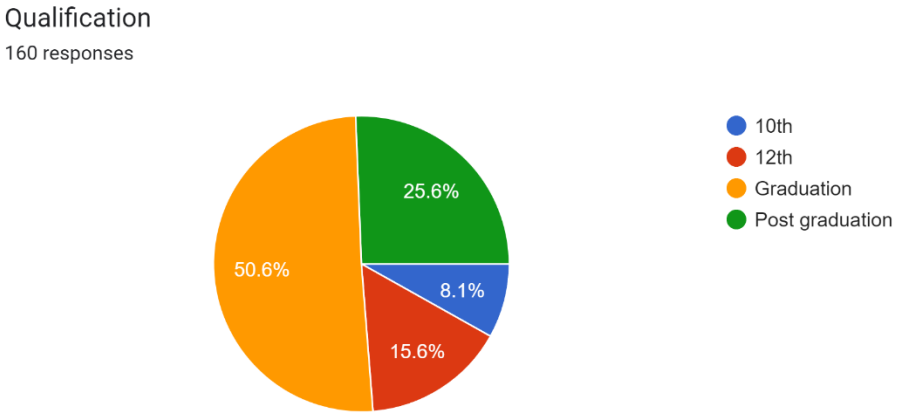


Interpretation:

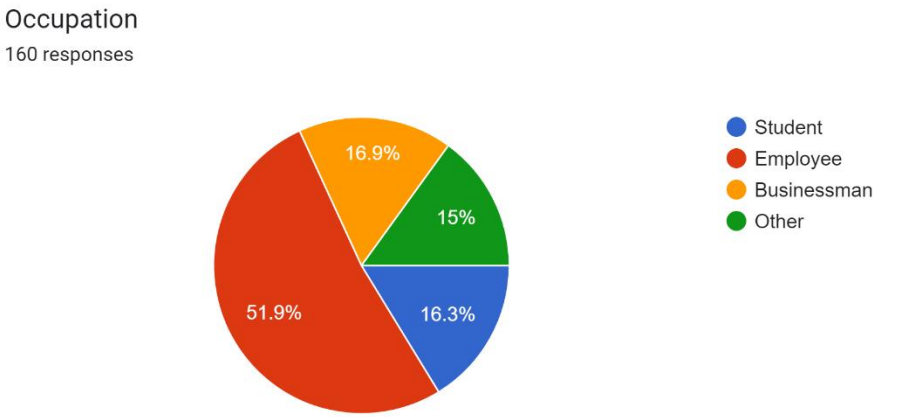
The Gender plays a vital role in the selection of the type of bike that has been used for travelling. The categories of male and female have the representation more or less equally where male has got 65% percent and female has got 35% percent respectively. The demographic variable of age does not have equal representation from both the categories which will help to infer when it comes to the usage of the Electric Bikes.



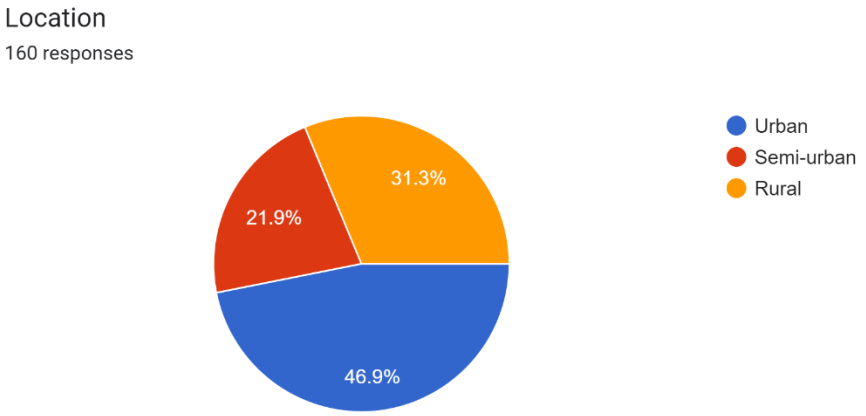
The age has been categories into four categories with the interval of 10 years except the first and last category. The majority of the respondents are in the category of below years which forms 36.3% percent of the sample involved in the study. There are 46.3% percent of the respondents who are in the category of 25-34 years. There are 12.5% percent of the respondent who are in the category of 35-44 years. followed by the category of 45 above years with the representation of 5% percent.



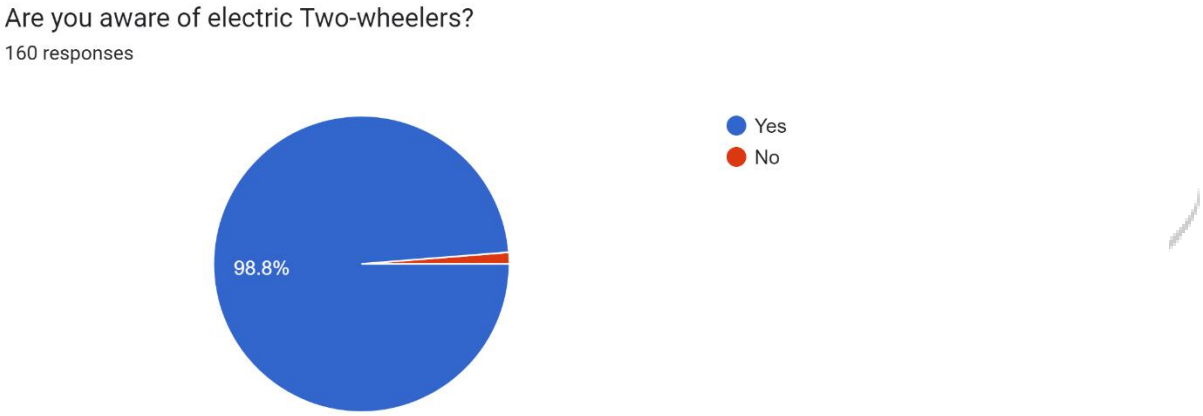
The education level of the respondents reveals the literacy level of the sample selected for the study. The education level has been categorized into four levels in which most of the respondents involved in the study are from the graduation level which accounts to 50.6 percent which is followed by 15.6 percent formed by the 12th and 25.6% percent formed Post graduation qualification. The least respondents are from the 10th category forms 8.1% percent.



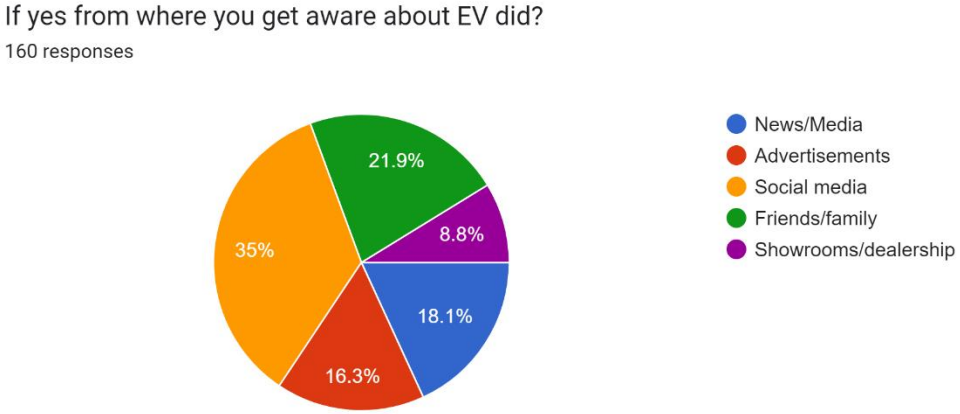
The occupation of the sample helps to determine the attitude of each class of groups towards the usage of the Electric Bikes. The employee group that has the majority of the respondents with 51.9% percent which is followed by the student category with the percent of 16.3%. The businessman group that has the majority of the respondent with the 16.9% percent and other category with the 15% percent.



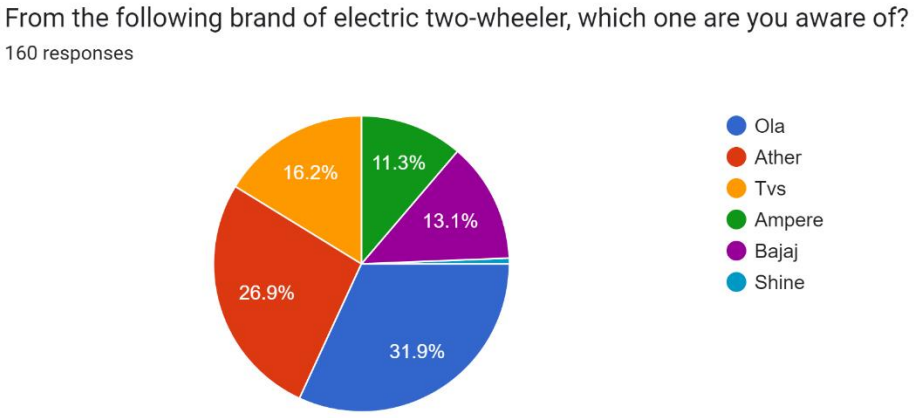
The Location of the sample helps to determine the attitude of each class of groups towards the usage of the electric bikes. The urban area location that has the majority of the respondents with 46.9% percent. The rural area location that has the 31.3% percent and 21.9% percent by the semi-urban area location usage of electric bikes.



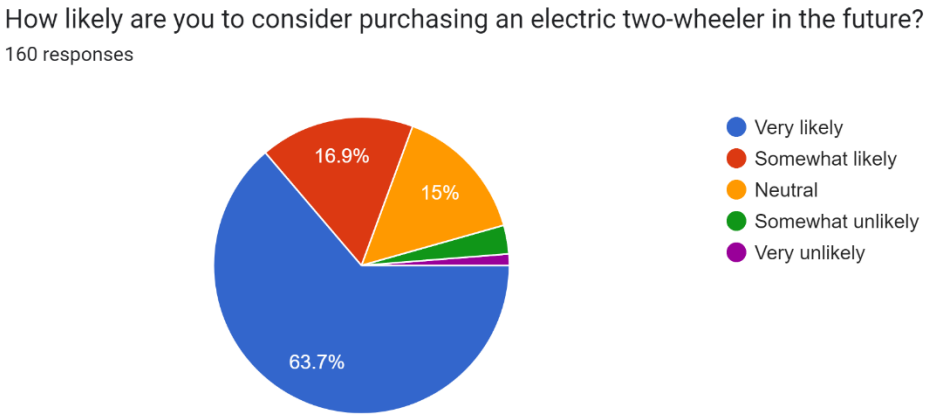
The aware about the electric vehicle are 98.8% percent and remaining are 1.2% percent not aware about the electric vehicle.



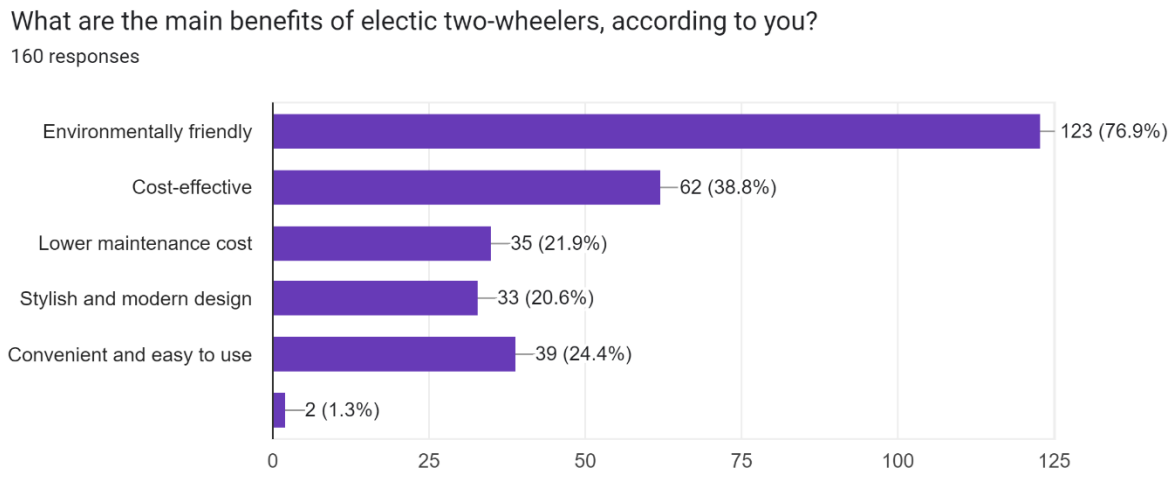
The people aware about the electric vehicle they are 35% percent are the social media and 21.9% percent aware about the electric vehicle are friends/family, the 16.3% percent aware about the advertisement and 18.1% percent aware about the news/media and 8.8% aware about the showroom.



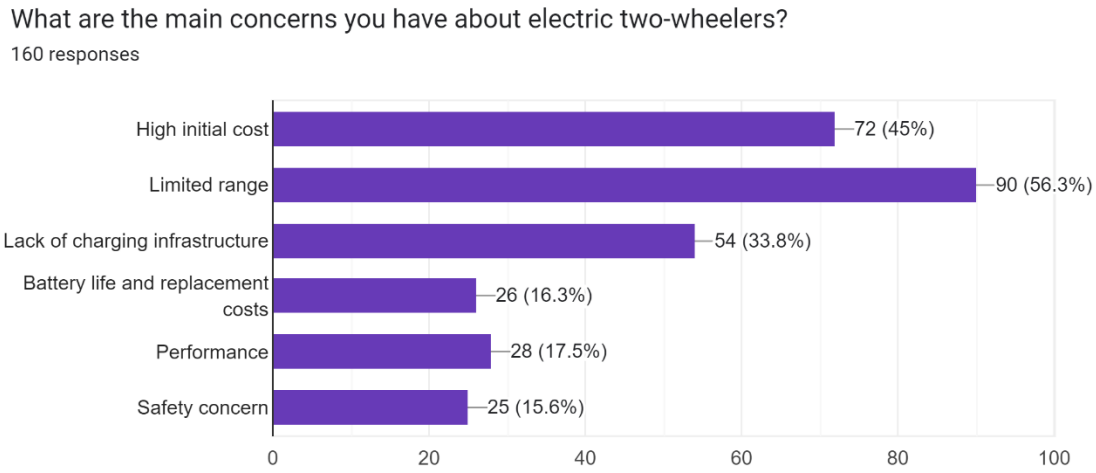
The person aware about the brand of EV the majority of person 31.9% percent aware about the Ola and the 26.9% percent aware about the Ather and Tvs brand aware of 16.2% and 13.1% percent aware about the Bajaj and 11.3% percent aware about the ampere brand of electric two-wheeler.



The sample determine the willing to purchase electric two-wheeler in future are 63.7% percent are purchase is Very likely and 16.9% percent consider purchasing are somewhat likely in future and 15% percent people are consider purchasing is Neutral about the purchase electric two-wheeler.

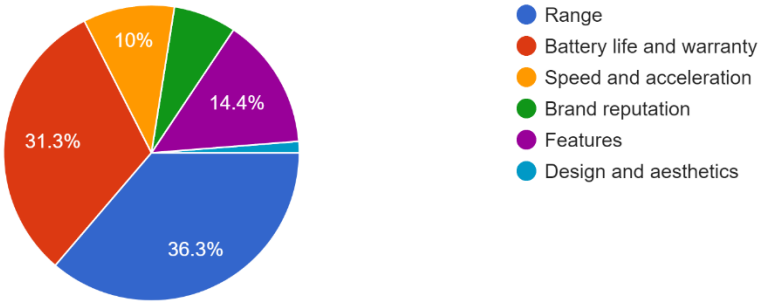


The sample help to knowing the benefits of purchase of electric two-wheeler. The respondent 76.9% percent are the purchase of electric two-wheeler benefits are Environment friendly, 38.8% percent respondent are says that cost-effective and 21.9% percent respondent are says that lower maintenance cost, 20.6% respondent are says that the electric two-wheeler are stylish and modern design and 24.4% percent respondent benefits of electric two-wheeler are convenient and easy to use.



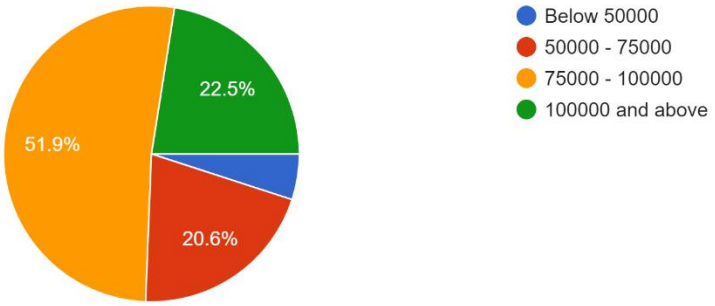
The people use of electric two-wheeler and main concern are 45% percent people are says that the concerns are high initial cost, 56.3% percent respondent says that limited range, 33.8% respondent are says lack of charging infrastructure, 16.3% percent respondent are says concerns about Battery life and replacement costs, 17.5% respondent are concern about the performance and 15.6% respondent concerns about the safety.

What features are most important to you when considering an electric two-wheeler?
160 responses



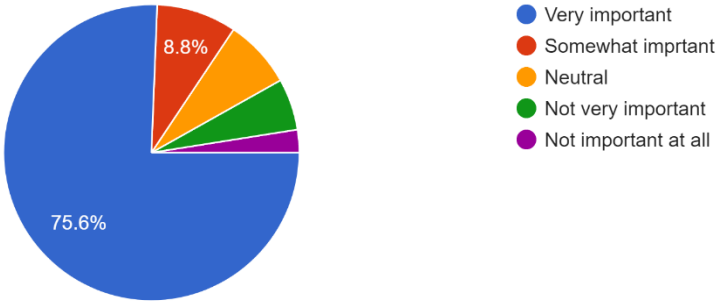
The respondent perception towards considering electric two-wheeler most important features are 36.3% respondent are says that range, 31.3% percent says that battery life and warranty,10% percent respondent says that speed and acceleration, 14.4% percent respondent says that features.

What is your preffered price range for an electric two-wheeler?
160 responses

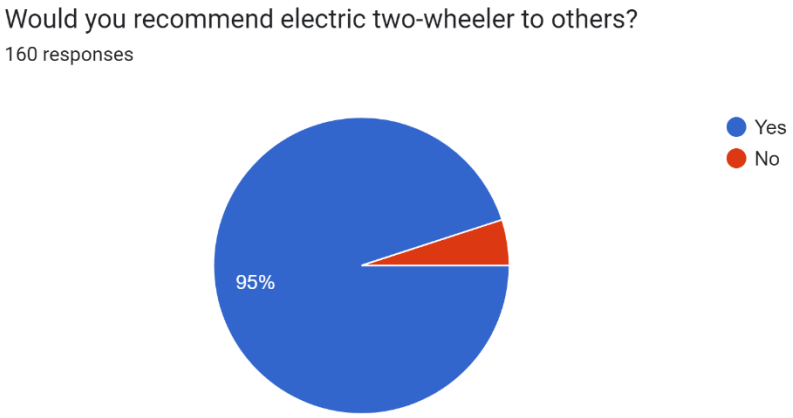


The respondent perception towards prefered price range for an electric two-wheeler are 51.9% percent respondent says that the price range are 75000-100000, the 22.5% percent prefered range are 100000 and above, 20.6% percent respondent prefered range are 50000-75000.

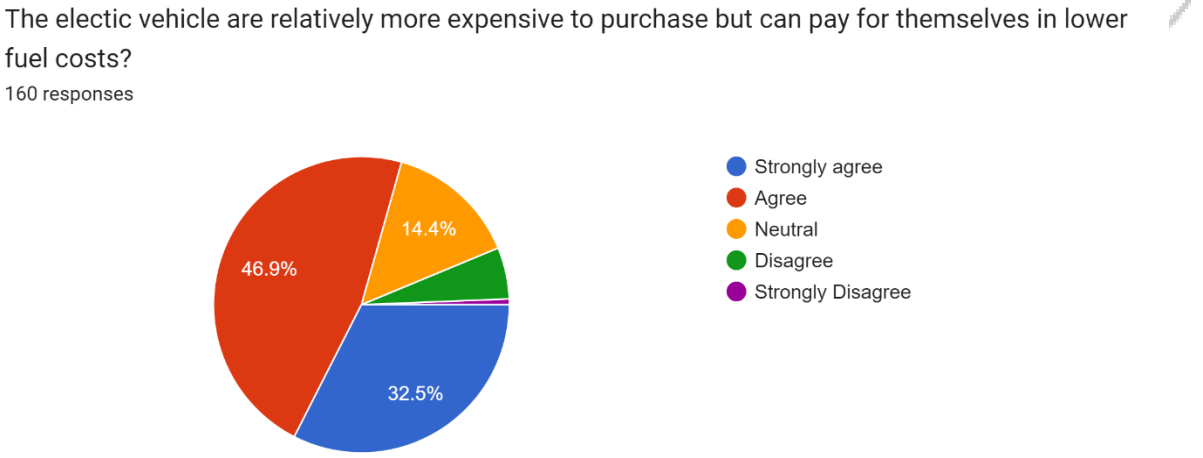
How important are government incentives (subsidies, tax benefits) in influencing your decision to purchase an electric two-wheeler?
160 responses



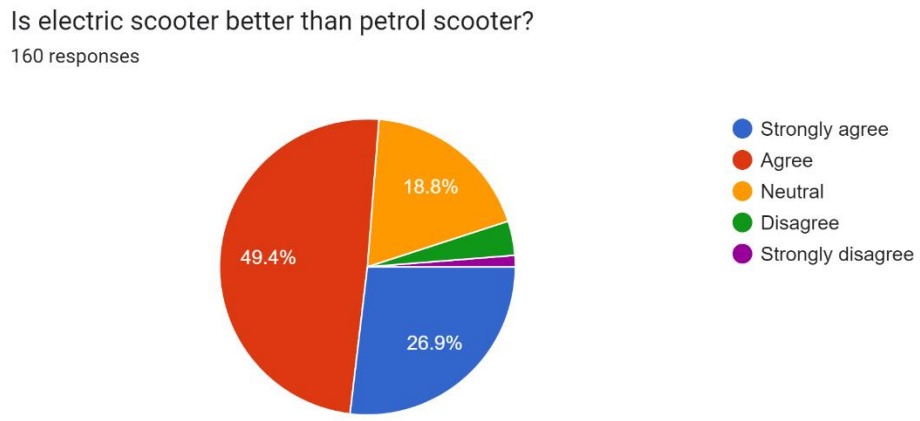
The respondent are purchase an electric two-wheeler that important of government incentives in influencing to purchase decision 75.6% percent respondent says that very important of government incentives, 8.8% percent respondent are says that government incentives are somewhat important and 7.5% percent respondent are neutral about the government incentives.



The people use of electric bikes and the 95% percent respondent are recommend electric two-wheeler to others and remaining 5% percent respondent are not recommend to others.



The electric two-wheeler are relatively more expensive to purchase but can pay for themselves in lower fuel costs 32.5% percent respondent says that strongly agree, 46.9% percent respondent are says that agree and 14.4% percent respondent are neutral about pay for themselves in lower fuel costs.



The 26.9% percent respondent strongly agree about electric scooter better than petrol scooter, 49.4% percent respondent agree about electric scooter better than petrol scooter and 18.8% percent respondent are neutral about electric scooter better than petrol scooter.

Limitation of the study

The research study conducted use to have minor limitations based on the conceptions and practical implications. The various limitations of the study that were identified to have minimal impact are listed below:

The study has taken the total population of the district as the population for the study. The confidentiality of the information of the consumers made it impractical to collect the data regarding the owners of the electric two-wheeler. This has made the researcher to adopt the district population from which the sample was selected.

The results of the study are applicable only to the buying behavior of the Electric two-wheeler and cannot be applicable to the other category of the bikes that are available in the automobiles market.

The lack of time can also be considered as a factor in maximizing the number of samples that are used in the study. The opinions must be biased on the variables of income and personal details which might have minimal impact on the outcome of the study.

Results and Findings

1. The users of the Electric Bikes involved in the study have the approval of 98.8% percent who aware about the Electric Bikes.

2. The social media has the highest percentage when it comes to dissemination of the information about the Electric Bikes.

3. The maintenance of the Electric Bikes has been high which was felt by the respondents involved in the study.

4. The Electric Bikes advertisement has influence on the respondents to purchase the Electric Bikes to the extent of 86.2 percent.

5. The respondents in the study have revealed that the Electric Bikes has been environment friendly

6. The usage of the Electric Bikes is restricted for only few days in a week. The Electric Bikes usage to such extent will damage the parts of Electric Bikes due to non-operation. The usage of the Electric Bikes to such effect will damage prolonged usage of the Electric Bike.

7. The majority of the respondents of the study have revealed that they would suggest the usage of the Electric Bikes to their friends and relatives.

8. The promotional activities are having significant impact on the purchase of the Electric Bikes which is supported by majority of the respondents.

Conclusion

Based on the analysis, electric vehicle manufacturers and the government of India have to invest more in social acceptance of the vehicle by creating more infrastructural facilities, high capacity batteries, putting more trust on technology that can create trust in consumers. The result clearly illustrates that the population is well aware of the environmental benefits. Because environmental suitability is one of the major concerns to be addressed and electric vehicles would ultimately aid in achieving the same as the carbon emissions from electric vehicles is almost 90% lower than conventional vehicle. Apart from manufactures, government should strive hard to spread awareness about EVs and influence positive perceptions among potential customers. Irrespective of the demographics, incentives from government for the purchase of electric vehicles have gained only limited awareness among the potential customers. People perceive that the price and maintenance cost is relatively high over other factors. Similarly charging infrastructure and drive range are perceived as low, and recharging time is perceived as high. Even though there are areas to improve for growth of EVs in India, there more 50% respondent are with the pan of owning an electric vehicle shortly.

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