

A Study On The Perception Of Electric Vehicles Usage Among Youth.

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ABSTRACT

This research aims to explore young people's perceptions about electric vehicles (EVs). It looks at things like environmental concerns, technological attractiveness, economic considerations, and performance preferences that affect how they see things. The study concludes that although youth are aware of the environmental advantages of electric vehicles, the main obstacles to their adoption are their high cost and inadequate infrastructure for charging. For this group, social media is the main source of knowledge about EVs. The paper advises employing focus groups, evaluating regional variances, harnessing social media influencers, and promoting technological innovation to boost the attraction of EVs for young consumers. In order to encourage youth to use electric vehicles and advance sustainable transportation, governments and automakers will find this research useful in developing their strategy.

KEYWORDS

Young Consumers, EV, Social Media, Charging Infrastructure, Economic Considerations,

INTRODUCTION

The global transportation industry is undergoing a paradigm transformation in the twenty-first century, driven by the urgent need to maintain environmental sustainability. One of the main causes of the transportation sector's greenhouse gas emissions is the combustion of fossil fuels in conventional automobiles. In place of conventional gasoline-powered cars, electric vehicles (EVs) provide a cleaner and maybe more efficient option. EVs have emerged as a possible answer.

But increasing EV adoption will require both a change in consumer behavior and technology breakthroughs. Comprehending the perspectives of heterogeneous groups is imperative in expediting this shift. Youth, who are often described as people between the ages of 19 and 25, have a particularly important place among these categories.

Young people are a generation that is best positioned to shape transportation in the future. They are regarded to be well equipped with digital technology, at ease with the newest gadgets, and open to new ideas. Additionally, their early car ownership experiences influence their long-term car-buying behaviors. Examining how they view EVs might provide useful information for automakers that want to design and sell cars with attributes and advantages that appeal to this important market.

This study explores the complex terrain of young people's attitudes about EVs. It considers the interaction of multiple circumstances that impact their perspective, going beyond a straightforward affirmative or negative answer. Here, we examine a few important research areas:

Environmental Consciousness: Given that climate change is still a major worldwide worry, this study will look at how much environmental concerns influence young people to think about buying electric vehicles.

Technological Appeal: Young people frequently accept technology early. This study looks into how young people view the technological innovations that electric vehicles (EVs) bring.

Economic Considerations: Although EVs may have clear long-term benefits, young people may find the initial purchase price to be a barrier. Finding out if cost factors matter to this population is one of the aims of this study. Additionally, it will look at how different regions view the financial effects of charging infrastructure.

Performance and Design: Owning an automobile has always been linked to a feeling of excitement and independence. This study looks into how young people view EVs' performance capabilities.

The goal of this research is to provide a complete picture of how young people view EVs. The results will be helpful not only to the automobile industry but also to authorities who want to encourage environmentally friendly modes of transportation. Closing the adoption gap between EVs' promise and their actual use in the field requires an understanding of young adults' perspective. Automakers can customize features and messages to appeal to younger buyers by using the research's findings to guide their focused marketing tactics.

OBJECTIVES

1. To assess how eco-awareness shapes young people's view of electric cars as sustainable transport.
2. To examine youth perceptions of electric vehicle technology versus gasoline cars.
3. To study economic factors' impact on young people's electric car perceptions.
4. To understand youth preferences for electric car performance and design.
5. To analyze young consumers' views on electric cars to guide marketing and policy strategies.

REVIEW OF LITERATURE

1.(P Goel, N Sharma, K Mathiyazhagan,2021) The harsh reality is that consumers do not seem to find the implementation of various government schemes to encourage the use of electric vehicles (EVs) appealing. Consumers who want to buy an electric vehicle face a few challenges. As a result, by carefully reviewing the body of existing research and defining new obstacles, we attempted to identify and analyze the main barriers to EV adoption in the current study. Based on a review of the literature, 35 barriers were initially identified in the Indian market. The DEMATEL (Decision-Making Trial and Evaluation Laboratory) method is used in the study's analysis. The primary concerns, according to the prominence and causal relationship analyses, were unclear government policies regarding EVs and familial factors that impede the decision to purchase an EV.

2.(N Abhyankar, AR Gopal, C Sheppard, WY Park, 2017) Government officials, planners, and regulators in India are increasingly supportive of aggressively electrifying passenger vehicles. According to Piyush Goyal, India's Minister of State for Coal, Power, New and Renewable Energy, one aspirational goal is to convert all vehicle sales to battery electric vehicles (BEVs) by 2030. India announced in 2012 that the National Mission on Electric Mobility (NMEM) aims to deploy 6 to 7 million electric and hybrid vehicles (EVs) nationwide by 2020 (DHI, 2012). Reducing India's reliance on oil imports is a key policy driver for transportation electrification. This study seeks to assess the impact of India's complete electrification of car sales by 2030 on the major.

3.(A Soman, H Kaur, H Jain, K Ganesan , 2020) India's automobile sector is facing challenges, ranging from broader economic decline to the need to improve emissions performance and the impending transition to electricity. Determining the auto industry's future direction, particularly in terms of electrification, will necessitate a thorough understanding of the potential benefits and consequences. In this study, we attempted to evaluate these by comparing a business-as-usual (BAU) scenario with low EV penetration to a scenario with 30% electric car (EV) sales in 2030. A number of countries that currently export a significant amount of automobiles and auto parts aim to achieve 100% electric vehicle sales by 2030. If not, the Indian auto industry may have missed out on an opportunity.

4.(David Block, John Harrison, Paul Brooker, 2015) This study aims to assess the current state of affairs and project the future market share of electric vehicles (EVs) in the US. Based on EV annual sales, which provide the total number of vehicles on the road from 2010 to 2014 along with growth rates for each of these five years, the forecasting technique is based. These growth values are used to calculate the values for the ensuing ten years. The number of electric vehicles sold in the United States in 2014 was 118,773, an increase from 96,700 in 2013. Over a year, this translates into a 23% growth rate in sales. Over the five-year sales period, a total of 286,390 EVs have been sold. Applying a conservative growth rate of 20%, the U.S.

5.(T Lieven, B Hügler , 2021) Since the beginning of 2020, the COVID-19 pandemic has posed a global threat to humankind. In addition to the millions of deaths and countless cases of illness, the economy has suffered. The fact that car sales have decreased by up to 25% in most nations is not shocking. However, rather than stagnating, overall sales of electric vehicles (EVs) rose to levels previously anticipated. Does this rise validate the hypotheses proposed by scientists in recently released papers about how COVID-19 has improved environmental consciousness and prompted sustainable behavior? Or is this just what happens, as evidenced by scientific studies, when governments offer financial incentives? This research looks into the causes of the surprisingly consistent rise in EV sales by comparing the effects of various factors during the pandemic

6.(P Maske, A Chel, PK Goyal, G Kaushik, 2021) According to this study, driving an electric vehicle (EV) can help cut down on air pollution caused by driving a car that runs on fossil fuels. If EVs are fueled by renewable energy sources, they have the potential to bring about a profound shift in the transportation industry. The study looks at how electric propulsion technologies are

used in freight and passenger international transportation, highlighting the infrastructure that is required for battery charging. Included is a brief review of EV battery advances, with a focus on the materials sustainability of lithium-ion batteries. The comparison of EVs available in India, an analysis of the challenges they face, and a summary of prospective future development regions round out the paper. It also looks at government rewards for electric vehicles.

7.(MN Arfi, 2020) This thesis examines the economic potential of electric vehicles (EVs) in India. It examines how India's growing economy and manufacturing might have put it in a strong position for the EV industry. The government's "Make in India" initiative and India's geographic location both contribute to the country's potential as a global hub for electric vehicles. In the ensuing ten years, India, a significant automaker, is expected to spearhead the global shift towards sustainable mobility and provide government incentives to drive the EV market.

8.(R Hema, MJ Venkatarangan, 2022) This study looks at how EV technology has to advance in India, where sales are rising quickly. It highlights the drawbacks of existing EVs and delves into developments in energy management, battery storage, and charging infrastructure that are essential for broader adoption. The goal is to make these innovations as convenient and inexpensive as possible to rival conventional gasoline-powered cars. The discussion of potential future paths for EV technology development finishes the report.

9.(S.Manzetti, F.Mariasui, 2015) This study provides a thorough analysis of the cutting-edge technologies in the transportation sector, including an assessment of non-toxic chemicals as cutting-edge green energy suppliers for the portable energy market that includes microelectronics and electric cars. This work also evaluates and speculates on future developments of biological systems for energy generation with a focus on bio batteries. In order to assess the environmental impact of the battery life cycle used in electric and hybrid vehicles, create new regulations regarding the disposal of waste from these vehicles, and encourage continuous progress in the field of portable, sustainable energy, legislative organizations across the European Union mainly rely on this work.

10.(A.Ajanovic, 2015) The future of electric cars is examined in this article. It makes an argument that EVs won't be successful until they can rival conventional vehicles in terms of price and range. Although the advantages for the environment are significant, government regulations and reasonably priced battery technology are also important. The development of

more affordable, longer-range batteries and the assurance that the electricity supplying them originates from renewable sources will ultimately determine the fate of electric vehicles.

11.(Hawkins, T. R., Gausen, O. M., & Strømman, A. H., 2012) To determine how effectively previous research on the environmental effects of hybrid and electric cars (EVs) covers these technologies' whole life cycle, a review of the literature is conducted. A summary of research findings is used to assess the global warming potential (GWP) of different internal combustion engine vehicle(ICEV) and electric vehicle (EV) options. Additional effects are contrasted, albeit the degree to which this is possible is constrained by the availability of data.

12.(Hao, H., Mu, Z., Jiang, S., Liu, Z., & Zhao, F, 2017) Greenhouse gas emissions and the manufacture of lithium-ion batteries are related, which have become a significant concern with the widespread adoption of electric vehicles. Using a life cycle assessment approach, this study calculates the greenhouse gas emissions associated with the manufacture of lithium-ion batteries in China. The results show that for the three most common types of lithium-ion batteries—the (LFP) battery, the battery, and the (LMO) battery—the greenhouse gas emissions resulting from the production of a 28 kWh battery are 3061 kgCO₂-eq, 2912 kgCO₂-eq, and 2705 kgCO₂-eq. This indicates a 30% rise in greenhouse gas emissions from car manufacture when compared to conventional motor vehicles. Approximately 75% of greenhouse gas emissions are attributed to the manufacture of wrought aluminum and cathode materials, which are the main contributors to emissions. Regarding process energy consumption, electricity use accounts for around 40% of overall emissions; China's GHG emissions are more than twice as high as those in the US for this purpose. Based on our findings, it is suggested that significant efforts be made to lower the greenhouse gas emissions from China's battery manufacture, with increasing cathode output being the most important step.

13.(Pirmana, V., Alisjahbana, A. S., Yusuf, A. A., Hoekstra, R., & Tukker, A, 2023) In the future, electric vehicles may progressively replace vehicles that run on fossil fuels. The trend suggests that more people are using electric vehicles overall, and electric cars in particular. Due to its large supplies of nickel, an essential raw material for the manufacturing of electric vehicle batteries(EVB), Indonesia is well-positioned to take advantage of this potential. The research examines the possible impacts on the environment and economy if Indonesia begins manufacturing electric cars (EVs) rather than exporting these raw materials outside. Using an input-output model, they evaluated the consequences of Indonesian electric car production on the environment and the economy. The premise of this study is that nickel, which is frequently exported, is used locally in Indonesia to produce electric vehicles and batteries, among other

things. Their estimates take into account direct and indirect output, value-added, and changes in employment. Using the same method, the environmental costs of altering emissions are also calculated. The numbers clearly indicate how profitable it is to produce batteries and EVs. The extra value-added in 2010 was worth Rp 100.57 trillion, or 1.5% of GDP.

14.(Kamper, A., Triebs, J., Hollah, A., & Lienemann, C, 2019) Electric vehicles present a great opportunity for remanufacturing-oriented product design because of the conceptual degrees of freedom in their product structure. Uncertainty over the quality of the returned product presents unique obstacles for remanufacturing, one of the core components of a circular economy. The remanufacturing industry uses a standardized survey to establish the existence of uncertainties and link them to difficulties in production planning and control (PPC) of remanufacturing operations. Moreover, it has been demonstrated that the existing approaches to managing uncertainty result in significant inefficiencies, impeding the profitable remanufacturing of intricate items like electric automobiles. The needs for a remanufacturing-specific PPC system are developed from the perspective of practitioners based on the survey's results.

15.(Cuenca, R. M., Gaines, L. L., & Vyas, A. D, 2000) An examination of the initial cost of electric cars (EVs) is included in this research. The first step involves analyzing the manufacturing and retail cost structure of high-volume, mature conventional automobiles and estimating the contributions of different cost categories to vehicle price. The expenses are then distributed across other vehicle component groupings, including the chassis, body, and powerplant. A review of the parallels and discrepancies between different component systems is conducted. An electric drive and a battery pack take the place of the traditional powertrain and gasoline system, respectively, in electric vehicles. An analysis is conducted on the costs of three different types of traction motors in high-volume production. The motor and controller package's various components are examined, and a summary of their typical pricing is provided. The costs and reviews of four different types of EV batteries are provided. A number of options are assessed and some sample costs are shown for the low-, medium-, and high-volume production of electric vehicles. Based on this analysis, a methodology that projects startup and ongoing expenses is provided. The average lifetime cost of owning and running an electric car is also estimated by the approach.

RESEARCH METHODOLOGY

This study looked into the impact of electric vehicles (EVs) on youth. A quantitative approach was used, with a self-administered online questionnaire.

Participants: The target population for this study was youth. Participants were recruited through a convenience sample distributed on social media platforms. The survey focused on individuals between the ages of 18 and 25 ($n = 51$).

Data Collection Instrument: An online questionnaire was developed using Google Forms to gather data. The questionnaire, comprising of 15 questions, included a combination of question formats:

Multiple-choice questions: These assessed general knowledge and preferences regarding EVs.

Likert scale questions:

These measured participants' attitudes and perceptions towards EVs on various aspects (e.g., environmental impact, cost, driving experience).

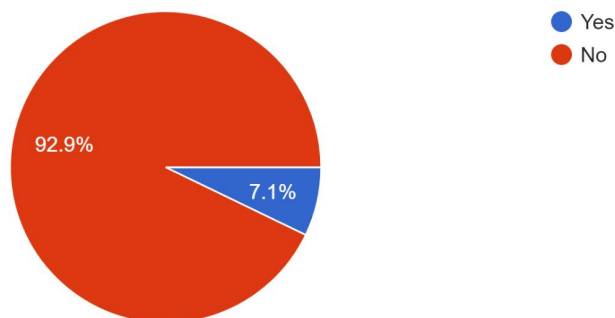
RESEARCH GAP

The research lacks data on participants' geographical background, and does not employ a larger sample size and gather data on participants' geographical demographics. This would enable a more nuanced analysis of young people's views on EVs across diverse populations. Deeper search could reveal valuable insights into brand perception.

DATA ANALYSIS AND INTERPRETATION

1.Do you currently own an electric vehicle?

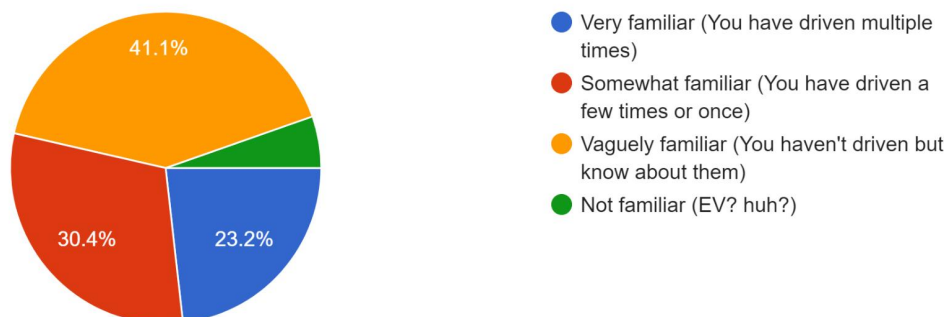
56 responses



The above pie chart depicts that the majority of respondents aged 19-25 do not own electric vehicles.

2.How familiar are you with electric vehicles (EVs)?

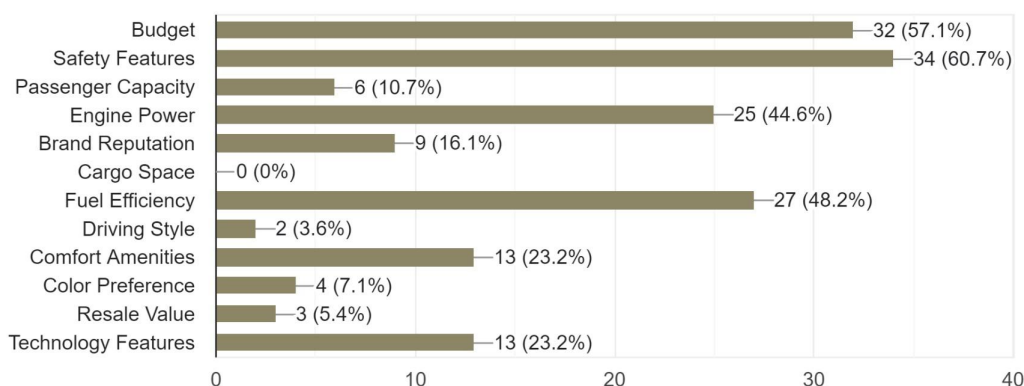
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The above pie chart shows that 23 respondents out of 56 (41.1%) have a general understanding of the working of electric vehicles and have ridden it before.

3.What are the top 3 factors you consider when choosing a vehicle?

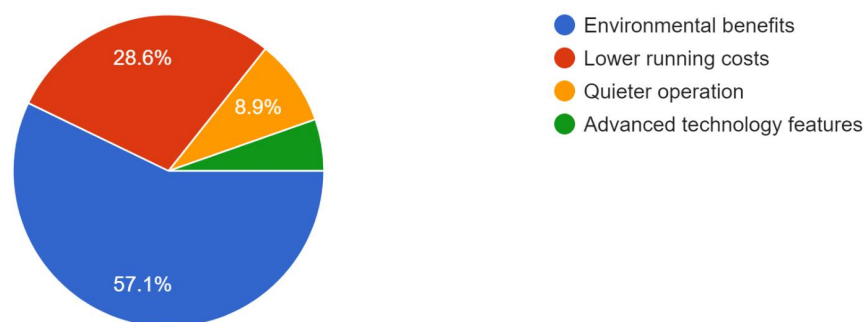
56 responses



As seen in the above bar graph, the majority of respondents take into consideration budget, safety features and fuel efficiency as the top factors before purchasing/choosing a vehicle.

4.In your opinion, what are the biggest advantages of electric vehicles?

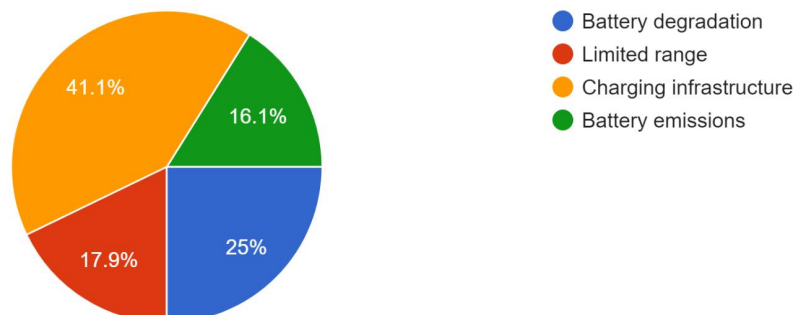
56 responses



In the above pie chart, 57.1% of the vote, the environmental benefits category was the most preferred. This shows that a significant number of respondents consider electric vehicles' ability to protect the environment to be one of its main advantages.

5. What are the biggest concerns you have about electric vehicles?

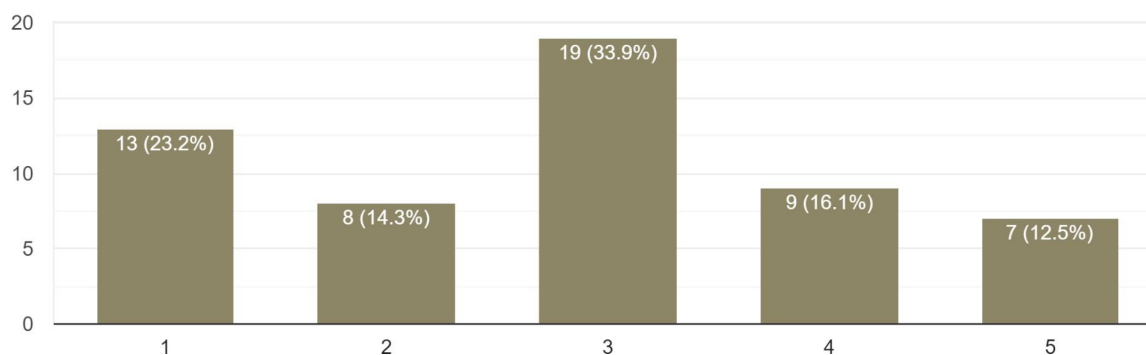
56 responses



In the above pie chart, the majority of votes (41.1%) were cast in favor of the charging infrastructure concern. This may indicate range anxiety in young people due to their concerns about the accessibility of electric vehicle charging facilities.

6. How likely are you to consider an electric vehicle for your next car purchase?

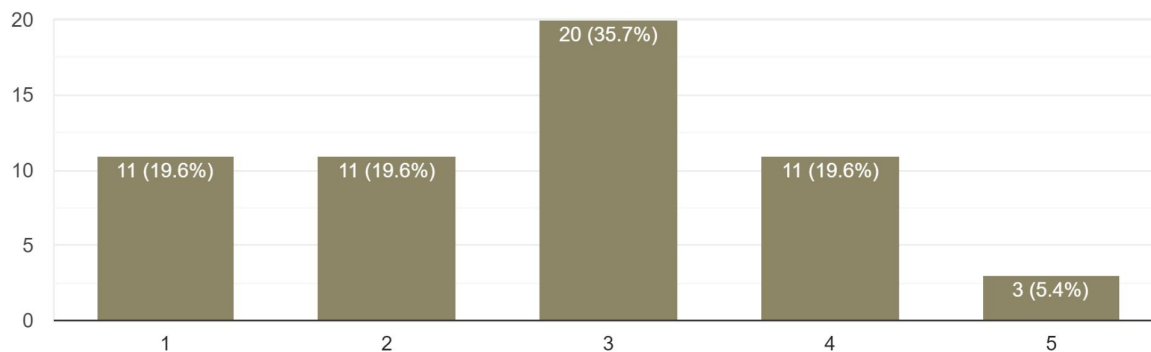
56 responses



In the above bar graph, When asked if they would consider buying an electric vehicle as their next purchase, the majority of respondents (33.9%) had a neutral position. This demonstrates the consumers' indecision about buying an electric car.

7. Compared to gasoline vehicles, how much more are you willing to pay for an electric vehicle to reduce your carbon footprint?

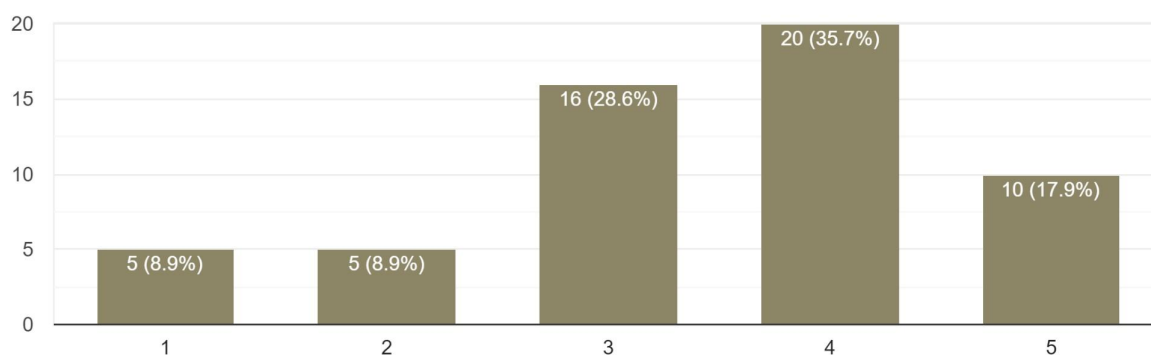
56 responses



In the above bar graph, when asked if they would be ready to pay extra for electric vehicles over gasoline-operated vehicles in order to lessen carbon footprint, the majority of respondents (35.7%) again took a neutral position.

8. To what extent do you find the advanced technology features often found in electric vehicles appealing?

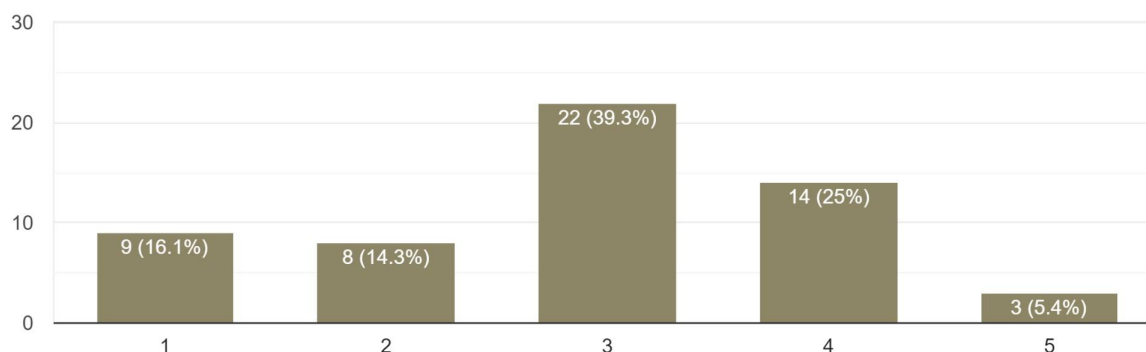
56 responses



In the above bar graph, When asked if the technology in electric vehicles appealed to them, the majority of respondents (35.7%). This suggests a high level of interest and excitement surrounding the innovative features of EVs among young people.

9. How confident are you in the overall reliability of electric vehicles compared to gasoline vehicles?

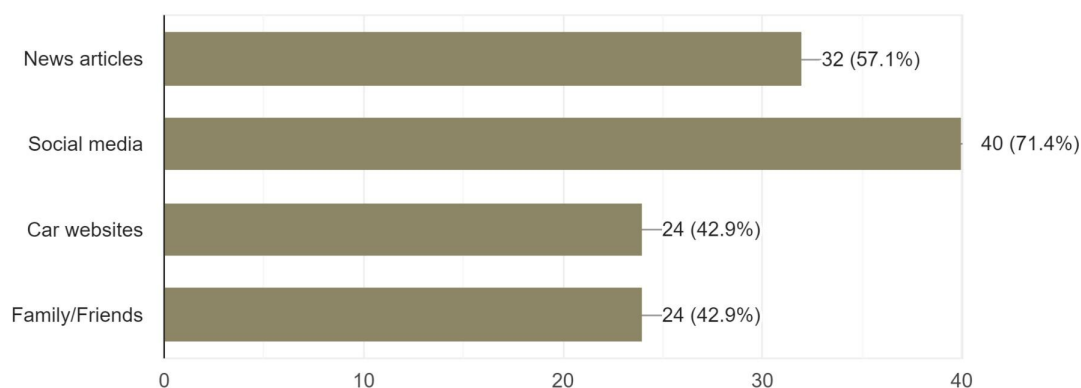
56 responses



In the above bar graph, the majority of respondents 39.3% expressed a neutral feeling towards the dependability of electric vehicles compared to gasoline-powered ones. This indicates a lack of strong conviction on either side.

10. Where do you get your information about electric vehicles? (select all that apply)

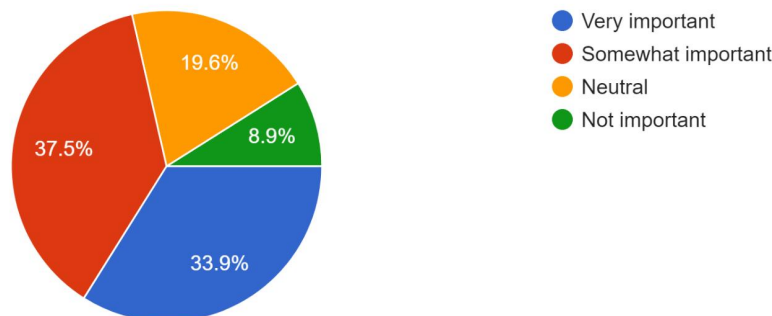
56 responses



In the above bar graph, A whopping 71.4% of respondents rely on social media as their primary source of information about electric vehicles. This highlights the dominant role social media platforms play in shaping young people's perceptions and knowledge about EVs.

11..How important is environmental sustainability when considering a vehicle purchase?

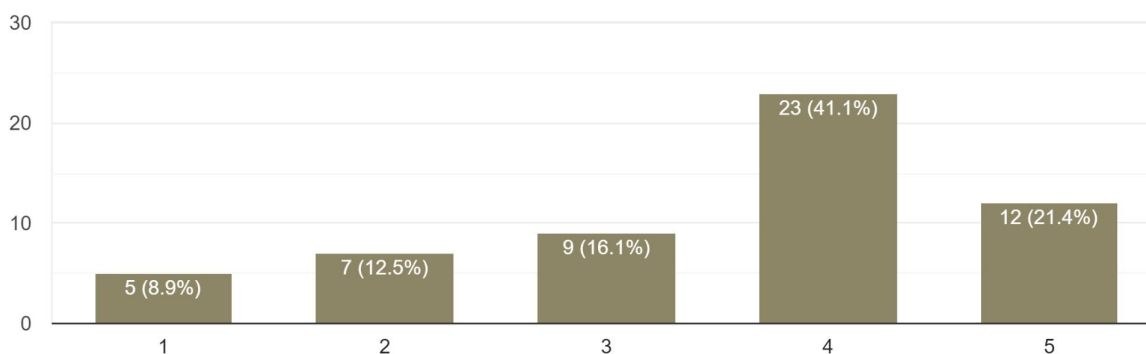
56 responses



In the above pie chart, When thinking about buying a car, a sizable percentage of respondents (37.5%) think that environmental sustainability is somewhat essential. This suggests that while not the sole factor that young people take into account when purchasing a car, for a sizable majority of them, environmental sustainability is an important one.

12.On a scale of 1 to 5, how likely do you think it is that electric vehicles will become the dominant form of transportation in the next 10 years?

56 responses



In the above bar graph, A significant portion of respondents (41.1%) voted in favor of electric vehicles (EVs) becoming the dominant form of transportation in the future. This indicates a strong positive outlook among young people regarding the potential of EVs to revolutionize the transportation sector.

FINDINGS & SUGGESTIONS

Findings:

1. Youth Has A Low EV Ownership

At the moment, a large percentage of youth do not own electric cars. This emphasizes a chance to comprehend the variables affecting their purchasing choices.

2. Minimal EV Exposure

Although most youth have some awareness of electric cars, they frequently don't have personal experience with them. This could be due to limited access to EVs through test drives, car-sharing programs, or ownership within their social circles.

3. Important Purchase Points for Young Drivers

Three primary considerations are given top priority by young drivers: cost, safety features, and fuel efficiency. These elements probably represent their need for a dependable and affordable car as well as their budgetary constraints.

4. EVs' Environmental Appeal

For young people, the environmental advantages of EVs are a big selling factor. This fits with their quest for environmentally friendly transportation options and possible concern about climate change.

5. The Absence of Infrastructure for Charging as a Barrier

The largest obstacle keeping young people from considering EVs is the restricted availability of charging infrastructure. This brings up issues with convenience and range anxiety, or the dread of running out of power before reaching a charging station.

6. Preference for Cars Running on Gas

At the moment, the majority of youth are more likely to buy gasoline-powered cars than electric ones. This shows that for this group of people, the benefits of EVs haven't yet surpassed the disadvantages.

7. Using Social Media as an Information Source

The benefits of EVs for the environment are an important appeal for young people. This demonstrates how crucial social media initiatives are for spreading accurate information and increasing public awareness about EVs.

Suggestions:

1. Ask young people in focus groups or surveys about their opinions, preferences, and concerns about EVs in order to obtain detailed information.
2. Examine regional variations in the accessibility of charging infrastructure and financial factors to customize government regulations and marketing plans.
3. Examine how social media influencers and educational initiatives might help raise awareness and debunk myths about electric vehicles among youth.
4. Look at how car manufacturers could employ innovation in technology and design to make EVs that appeal to young people's sense of style and need for cutting-edge features.

CONCLUSION

This study investigates how young people view electric cars (EVs). The study indicates that although youth are aware of the environmental advantages of electric vehicles, they place a higher value on accessibility to charging infrastructure and pricing. Their main information source concerning EVs is social media. To increase the attraction of EVs for younger consumers, the study suggests utilizing focus groups, taking into account regional variations, utilizing social media influencers, and encouraging technological advancement. These results can help automakers and policymakers develop programs to promote EV adoption among youth, a critical population for accomplishing sustainable transportation objectives.

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