

A STUDY ON CONSUMER SATISFACTION ABOUT ELECTRIC BIKES (E-BIKES) WITH SPECIAL REFERENCE TO COIMBATORE CITY

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Abstract: Travelling has come long way from the days of the walking to various forms of modern transportation of the globalised world. The people use to travel by walking in the ancient times. Those were the days when people use to travel without affecting the nature. The evolution of the transportation has made giant leaps to the current stature. The travelling time of the ancient times has been reduced drastically with the innovation of the science.

The journey of the development of the transports has drastically decreased the travel time. The scientific inventions in the field of transport are still evolving. The days of ancient transportation for travelling are completely departed in the modern world. The high power cars, bullet trains and air transport has made the transport sector as one of the prime sector that indulges in the manufacturing. The manufacturing base of the transport sector has high use of research and development in enhancing the performance of the vehicle. The usage of the engine in the vehicles has been largely developed with the help of the research and development with based on the consumer's needs of the market. The classical evolution of the engines has put forward lot of environmental problems in the society. This environmental friendliness has been the need of the hour in the 21st century. The flow of the vehicles at the world level has been constantly increasing to that of the population which will erode the nature's ability to absorb the emitted pollutants.

Keywords: Electronic bikes, E-bikes, Consumer Satisfaction, Buying, Preference

INTRODUCTION TO THE STUDY

The research is looking forward to evaluate the degrading effects of the petrol and diesel engine of the environment. The mode of transport has also been changing the preferences towards the electric engines. The growth of the electric engines can be traced back to the 17th century. The strong foundation for the electric engine is not realized in that century. The globalised and modern world is realizing the importance of the electric engines in all ways of the life to minimize the effect modes of transport to the environmental degradation.

The consumer's preferences and attitudes is change towards the usage of the electric engines. These preferences of the consumers will be added advantage to the manufacturers who are willing to adapt to the change. The probable flexible manufacturer can become the market mover of the automobile segment in the future. Global warming is a big concern of the present era where the whole world is working towards finding ways to be environment friendly and bringing solutions for the same.

All the sectors are trying to work with their go green tactics and being environmentally friendly. Even the two-wheeler sector is trying to help the environment with the innovation of electric two-wheelers and avoiding fuel which can cause higher pollution and harm to the environment.

ELECTRIC VEHICLES MARKET IN INDIA:

India aims to become a global electric vehicle market with major automakers and electric vehicle start-up where increased significantly in the last five years. The India electric vehicle market is expected to reach very high in 2026. It is expected to grow faster during the forecast period due to various government initiatives and policies. The government has rolled out several incentives to both the consumer and manufacturer to stimulate the Electric Vehicle market.

. India offers the world's largest untapped market, especially in the Electric two-wheeler segment. As 100 percent foreign direct investment is allowed in this sector under the automatic route market is expected to gain momentum during the forecast period. India aims of switch 30% of private cars, 70% of commercial vehicles, and 80 % of two and three-wheelers to EV by the year 2030. Both Central and state governments are offering various incentives to buyers and manufacturers

STATEMENT OF PROBLEM

Electric bikes industry is the one of the biggest business in the vehicle area of worldwide market. Being the pioneer in item and process innovations in the assembling part, it has been perceived as one of the drivers of financial development.

Introduction of electric bikes is a perfect solution to cut cost and energy conservation. In this study reveals that, to analyze the customer satisfaction in detail.

SCOPE OF THE STUDY

- This study aims at finding the customer perception and customer satisfaction towards electric bikes with respect to Coimbatore city.

- The study by ascertaining the factors that motivates end users to purchase electric bikes.
- The study also aims to help companies and dealers to improve their sales promotion, services

OBJECTIVES OF THE STUDY

- To analysis the demographic factor influence the purchase of electric bikes.
- To know the perception about electric bikes
- To find out the satisfaction level of consumer towards electric bikes.
- To analysis the problems and constrains of the electric bikes
- To provide findings and suggestion about electric bikes

RESEARCH METHODOLOGY

Research methodology is the specific procedures or techniques used to identify select, process and analyse information about a topic.

Research Design

A Research Design is simply a structural framework of various research methods as well as techniques that are utilised by a researcher. It includes mode of data to be collected, sample to be selected and the analysis part of research. In this research descriptive research design is used.

Descriptive Research Design

Descriptive research design is a type of research design that aims to obtain information to systematically describe a phenomenon, situation, or population. More specifically, it helps answer the what, when, where, and how questions regarding the research problem, rather than the why.

Sampling Method

Simple Random Sampling method is used.

Simple Random Sampling

Simple random sampling is defined as a sampling technique where every item in the population has an even chance and likelihood of being selected in the sample. Here the selection of items entirely depends on luck or probability, and therefore this sampling technique is also sometimes known as a method of chances.

Method of Data collection

There are two methods of data collection

1. Primary data
2. Secondary data

Primary Data

Primary data are those that are collected afresh from first-hand sources. Questionnaire method is used in this study. The types of questions used are:

1. Close-ended
2. Open-ended
3. Multiple choice
4. Rank scale

Secondary Data

Secondary data is the data that have been already collected by and readily available from other sources. It was collected from journals, books and internet sources.

1.5.4 Sample Size

The sample size is 300 respondents

1.5.5 Statistical tools used for the study

The statistical tools used for analysis are

- Simple Percentage
- Ranking Analysis
- Chi-Square
- Correlation

1.6 LIMITATIONS OF THE STUDY

- The survey is based on the respondent chosen at random from Coimbatore city so; the result of the study cannot be generalized.
- Due to time constrains the results might not be accurate.
- It is not applicable universally.
- The sample size has been restricted to 300 respondents.

REVIEW OF LITERATURE

MukeshSharma (2002)¹ the study identifies and evaluates the consumer perception towards various factors about electric bike. The result of the study shows that there is a combination of both positive and negative effects on customer perception. It also

¹ Mukesh Sharma conducted “A study on consumer Awareness and Perception towards Electric Bike”.

shows that maximum number of respondents is not aware of Electric Bikes .So the various promotional to activities need to be taken in order to increase the sales. Most of the respondents consider the cost and the mileage while purchasing a bike, so there are ample potential to electric bike in two wheeler sectors. But their battery performance, speed, appearance are the major factors, which is affecting the sales of Electric Bike.

James Belias et al., (2003)² they conducted a study on “Encouraging E-bikes use: This report examines the regulation of power assisted bicycles in Australia and overseas. The current regulations are reviewed and reasons for revising the regulations and reviewed and reasons for revising the regulation in Australia are outlined.

Sakamoto, (2004)³, they carried out experimental work on design and manufacture of electric motorcycle. The whole work was done by student itself. Work included on this motorcycle was 3D-CAD, stress analysis and manufacture. Maximum velocity obtains to be around 23 km/h.

Mahadik et al, (2005)⁴ the study introduce the concept of electric bike. He converted the normal bicycle in to electrical one with an innovative approach. Charging of Battery was provided by three ways specifically by means of wall charging, solar charging and by mechanical pedal. Main focus of concept was on System Architecture, operational Concept and Battery Management.

DATA ANALYSIS AND INTERPRETATION

In this chapter, the analysis and interpretation of the study on sample size of 300 respondents and the data collected are classified and tabulated. Further the following statistical measures are employed in fulfilling the objective of the study.

STATISTICAL TOOLS USED FOR THE STUDY

The statistical tools used for analysis are

- Simple Percentage
- Ranking Analysis
- Chi-Square
- Correlation

TABLE 1
AGE OF THE RESPONDENT

Age	Frequency	Percent	Valid Percent	Cumulative Percent
Below 25	108	36.0	36.0	36.0
26-35	99	33.0	33.0	69.0
36-45	69	23.0	23.0	92.0
Above 45	24	8.0	8.0	100.0
Total	300	100.0	100.0	

INTERPRETATION:

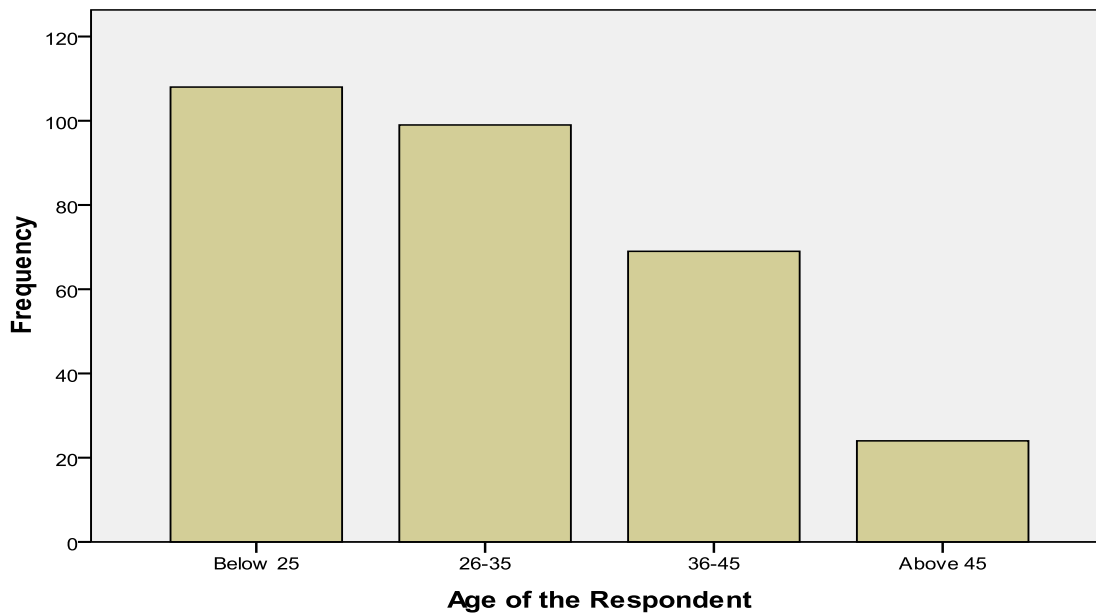
From the above table, it was found that, there are totally 300 respondents that have been collected data. Here, 36% of the respondents belong to below 25 years, 69% of them belong to 26-35 years, 92% of them belong to 36-45 years, and 8% belongs to above 45 years of age group. It could be concluded that, majority of respondents were middle aged.

² James Belias, Pyrou Chung, James Macdonald

³ Haruo sakamoto “Design and manufacture hand-made electric motorcycle, 2004”.

⁴ Chetan Mahadik, Sumit Mahindraka, Prof. Jayashree Deka, “An Improved & Efficient Electric Bicycle system with the power of real –time Information Sharing”. ISSN:2348-6953

CHART 1
Age of the Respondent



CHI-SQUARE:

A chi-square test is a statistical test used to compare observed results with expected results. The purpose of this test is to determine if a difference between observed data and expected data is due to chance, or if it is due to a relationship between the variables you are studying. The test explains if two attributes are associated.

$$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

Where,

χ^2 = chi squared

O_i = observed value (actual value)

E_i = expected value

FORMULATION OF HYPOTHESIS:

Null Hypothesis (H_0): There is no significant difference between difference between observed value and expected value

Alternative Hypothesis (H_1): There is a significant difference between observed value and expected value

TABLE 2
MONTHLY INCOME OF THE RESPONDENT * RESPONDENT'S FREQUENTLY USE OF ELECTRIC BIKES

			Respondent's frequently use of electric bikes					Total
			Every day	Twice a week	Weekly once	Occasionally	Rarely	
Monthly income of the Respondent	Below 25000	Count	44	23	13	6	13	99
		% within Monthly income of the Respondent	44.4%	23.2%	13.1%	6.1%	13.1%	100.0%
	25001-35000	Count	10	43	6	4	0	63
		% within Monthly income of the Respondent	15.9%	68.3%	9.5%	6.3%	.0%	100.0%
	35001-45000	Count	44	19	7	18	0	88
		% within Monthly income of the Respondent	50.0%	21.6%	8.0%	20.5%	.0%	100.0%
	Above 45000	Count	23	10	0	4	13	50
		% within Monthly income of the Respondent	46.0%	20.0%	.0%	8.0%	26.0%	100.0%
Total		Count	121	95	26	32	26	300
		% within Monthly income of the Respondent	40.3%	31.7%	8.7%	10.7%	8.7%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	96.742 ^a	12	.000
Likelihood Ratio	103.203	12	.000
Linear-by-Linear Association	.282	1	.596
N of Valid Cases	300		

a. 2 cells (10.0%) have expected count less than 5. The minimum expected count is 4.33.

FORMULATION OF HYPOTHESIS:

Null Hypothesis (H₀): There is no significant difference between monthly income of respondent and frequently use of electric bikes.

Alternative Hypothesis (H₁): There is a significant difference between monthly income of respondent and frequently use of electric bikes.

INTERPRETATION:

Above table shows that result, P value (.000) is less than the alpha value (0.05), so reject the null hypothesis and accept the alternative hypothesis. There is a significant difference between monthly income of respondent and frequently use of electric bikes.

Correlation

Correlation coefficients are used to measure the strength of the relationship between two variables. Pearson correlation is the one most commonly used in statistics. This measures the strength and direction of a linear relationship between two variables. Pearson's correlation is calculated as follows:

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}}$$

Where,

- r** = correlation coefficient
- x_i** = values of the x-variable in a sample
- \bar{x}** = mean of the values of the x-variable
- y_i** = values of the y-variable in a sample
- \bar{y}** = mean of the values of the y-variable

FORMULATION OF HYPOTHESIS:

Null Hypothesis (H_0): There is no significant correlation difference between (two variables) independent variables and .dependent variables.

Alternative Hypothesis (H_1): There is a significant correlation difference between (two variables) independent variables and .dependent variables.

EDUCATION OF RESPONDENT AND RESPONDENT'S AWARE OF BASIC FEATURES ABOUT ELECTRIC BIKES.

FORMULATION OF HYPOTHESIS:

Null Hypothesis (H_0): There is no significant correlation difference between education of respondent and aware of basic features about electric bikes.

Alternative Hypothesis (H_1): There is a significant correlation difference between educations of respondent and aware of basic features about electric bikes.

TABLE NO 3

Correlations			
		Education of the Respondent	Aware of basic features about electric bikes by the Respondent
Education of the Respondent	Pearson Correlation	1	-.286**
	Sig. (2-tailed)		.000
	N	300	300
Aware of basic features about electric bikes by the Respondent	Pearson Correlation	-.286**	1
	Sig. (2-tailed)	.000	
	N	300	300

** . Correlation is significant at the 0.01 level (2-tailed).

INTERPRETATION:

Above table shows that result, Pearson Correlation value is (-.286) lesser than the significant value (.000) there is negative Correlation so, educations influences the aware of basic features of electric bikes.

RANK ANALYSIS

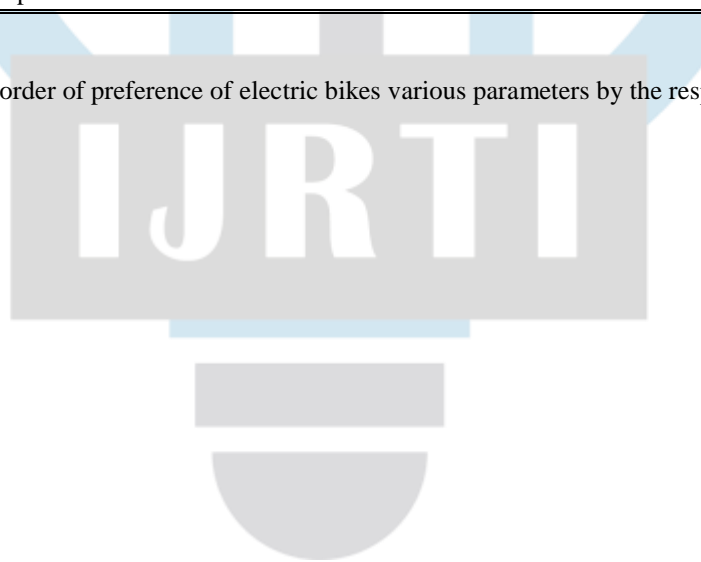
Under this method, the respondents are asked to rate the preference choices. This method is easier and faster. Here in the study, the respondents are asked to rate their preference of electric bikes factors. Respondents are asked to rate 1, 2, 3, 4 and 5.

TABLE 4
RANK THE ORDER OF PREFERENCE

Ranks	
	Mean Rank
Respondent's preference level in weight and quality	9.41
Respondent's preference level in Eco-friendly	8.99
Respondent's preference level in handling method	8.68
Respondent's preference level in battery backup	7.00
Respondent's preference level in appearance and brand	7.75
Respondent's preference level in performance	7.72
Respondent's preference level in durability	7.12
Respondent's preference level in quick recharging time	8.38
Respondent's preference level in pick up	8.57
Respondent's preference level in less noise	7.78
Respondent's preference level in fuel saving	8.34
Respondent's preference level in money saving	8.12
Respondent's preference level in no license	7.00
Respondent's preference level in safety	7.56
Respondent's preference level in produce less carbon emission	7.58

INTERPRETATION

Table 4.4.1 reveals the order of preference of electric bikes various parameters by the respondents. With a highest score 9.41 to least score 7.00.



**TABLE 5
HIGHLY PREFERRED FACTORS**

Consumers Preference towards	Mean Rank
Respondent's preference level in weight and quality	9.41
Respondent's preference level in Eco-friendly	8.99
Respondent's preference level in handling method	8.68
Respondent's preference level in pick up	8.57
Respondent's preference level in quick recharging time	8.38

**TABLE 6
MODERATE PREFERRED FACTORS**

Consumers Preference towards	Mean Rank
Respondent's preference level in fuel saving	8.34
Respondent's preference level in money saving	8.12
Respondent's preference level in less noise	7.78
Respondent's preference level in produce less carbon emission	7.58
Respondent's preference level in safety	7.56

**TABLE 7
LEAST PREFERRED FACTORS**

Consumers Preference towards	Mean Rank
Respondent's preference level in battery backup	7.00
Respondent's preference level in appearance and brand	7.75
Respondent's preference level in performance	7.72
Respondent's preference level in durability	7.12
Respondent's preference level in no license	7.00

CONCLUSION

The study is based on the customer satisfaction towards Electric bike. It concludes the respondents are satisfied with the quality, price and performance of the E-bike, most of the respondents are motivated by work groups to buy the E-bike and also customers feels the price of E-bike is Neutral. Most of the respondents feels that e-bikes are easy to drive because it is weightless. So the weight of the bike should not increase in future. The study outcomes also indicates that most of the customers were satisfied

WEBSITE

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