Consumers Perceptions of Hero Electric Two Wheelers in Bardoli City

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Abstract: The purpose of the study is to investigate the motives for purchasing electric bikes and to determine user satisfaction and recommendation of Hero Electric Bikes. Satisfaction is measured by selected factors such as affordability, appearance, charging time, speed, pick-up quality, legroom, brand, service quality, and overall. Primary data were collected from 60 users of e-bikes in the city of Bardoli using a structured questionnaire in Google forms. Non-parametric tests were applied to draw conclusions. The results of the study show that the increase in fuel price is the main motive for the purchase of e-bikes. User satisfaction is the same according to gender and model used, but the difference in user satisfaction was found for speed. 73% of users recommend Hero e-bikes to others. Hero electric ltd must work with the government to raise awareness of e-bikes among citizens to protect the environment.

Keywords- Electric Vehicles, Electric Bikes, Customer Satisfaction, e- bikes, Fuel price

1. INTRODUCTION

Petroleum is not a renewable source that will be depleted in the future. Therefore, to solve the problems related to limited resources, alternative fuel sources are being developed, which include electric vehicles. The global electric vehicle market is expected to reach \$823.75 billion by 2030. After the pandemic, the market for electric vehicles has seen a surge. The global demand for electric vehicles increases by 65% from 2017 to 2018. Only 9% year-on-year growth in electric vehicles. 2020 will see a 25% decline in the first quarter. The COVID 19 pandemic has negatively impacted the entire automotive industry and is also affecting the electric vehicle industry. After a continuous decline of two years in 2020 and 2021, a 20% decrease in electric vehicle registrations was recorded in 2021. The electric vehicle market includes three types of vehicles, namely battery electric vehicles, hybrid electric vehicles, and plug-in hybrid electric vehicles. These types of electric vehicles can also be divided into two-wheelers, passenger cars, and commercial vehicles. Demand for two-wheelers is currently greater than that for passenger cars and commercial vehicles in India, but demand for passenger cars will increase more than that for two-wheelers and commercial vehicles in the future. Charging stations are not required for two-wheeled electric vehicles, but adequate charging station infrastructure is required for commercial vehicles and passenger cars. Due to the lack of charging stations, the demand in the electric vehicle market is low. Indian government plans to introduce only electric vehicles by 2030. i

In India, demand for two-wheelers has increased from 2020 and will continue to increase at an average growth rate of 27.6% through 2027. From 2000 to 2021, many companies were established to manufacture electric two-wheelers. The production of Hero e-bikes began in 2000, but in 2007, the company established Hero Electric as an independent company. The brand image of Hero Bikes is for bicycles, motorcycles and scooters. Many other electric bicycle manufacturers include Ampere, Ather Energy, Ola electric and Okinawa Autotech. Hero Electric is used for the study.

2. **REVIEW OF LITERATURE**

(Dr. Babar Zamaan Mohammed, 2022) the study focuses on determining the correlation between environmental awareness and customer experience. It also examines the impact of environmental awareness and customer experience on customer engagement. A total of 240 samples from Banglore city were collected using Cochran's sampling formula through a structured questionnaire. Bivariate correlation and multiple regression were used for the analysis. It has been found that people's increasing concern for the environment leads them to choose electric vehicles, and it has also been proved that the customer's emotional factor also has an impact on customer commitment.

(M Ukesh, 2022) The main objective of the study was to investigate customer satisfaction with electric two-wheelers in the city of Coimbatore. Data were collected through a questionnaire from 200 respondents who use electric bicycles in the city. Simple percentage and rank analyses using Kendall's (W) concordance coefficient were used for the analysis. Customers are satisfied with the low operating costs and better customer service.

(Vinoth S, 2021) They study the customer perception regarding electric two-wheelers in Chennai to identify the factors that influence the purchase of e-bikes, to analyze the key features of e-bikes, and to determine the awareness level of electric bikes in Chennai. The sampling method used is descriptive research and random sampling method. The sample size used for the study is 120 respondents. Chi-square test and ANOVA are used for analysis. No relationship was found between age group and preferred features of electric bicycles. Customers were less aware of the features and benefits of electric bicycles.

(Yeongmin Kwon, 2020) This study investigates the satisfaction level of battery electric vehicle users because the BEV market is growing slowly compared to the overall market growth. They investigated the respondents' intention to purchase or recommend the BEV again. Data was collected from a total of 160 respondents who had used the vehicle for at least six months. A structured equation model with partial least squares was used for the analysis. The results show that of the total nine hypothesized associations, seven hypothesized associations were statistically significant. Users were satisfied with cost savings, range and recharging had a positive impact on users, and satisfied users had the intention to recommend BEVs to others and purchase them again.

(Ms. Mifzala Ansar, 2019) The basic objective of this study was to assess the level of awareness and factors driving customers to purchase e-bikes and to understand the government's initiatives to promote e-transportation. Primary data were collected from 120 potential customers in Bangalore city. They found a relationship between awareness and e-bike purchasing behaviour. Respondents were aware of the reduction in emissions from electric vehicles. Respondents were environmentally conscious and would like to purchase e-vehicles.

(Pretty Bhalla, 2018) The study focused on consumer perceptions and purchase intentions of commercial electric vehicles. They examined the various factors that influence car buyers' purchase decisions. Data was collected via an online survey, using a purposive random sample for data collection. Data from a total of 233 respondents were used for the analysis. The main findings show that there is a correlation between environmental concerns and electric vehicle acceptance. The social acceptance of electric vehicles is lower compared to fuel-powered vehicles.

(Thomas Franke, 2017) The aim of the study was to understand the factors of customer satisfaction of users of battery electric vehicles. A total of 72 respondents were analyzed and it was found that the classic indicators of users were not satisfied, while the variance in the range of satisfaction was found in different indicators.

(Yanping Yang, 2016) The main objective of the study was to examine customer satisfaction with a battery-powered electric vehicle. The aim was to find out what the customer's needs are and what helps to improve the customer's satisfaction. The Kano model was used for the analysis. Four different approaches were examined. One-dimensional quality makes battery electric vehicles more competitive than conventional vehicles.

3. METHODOLOGY

The motive of this study is to examine the motive for purchasing e-bikes and the level of satisfaction with the use of hero e-bikes with the demographic factors. In this study, the satisfaction level of customers is measured by the following factors: Affordability, Appearance, Charging Time, Speed, Pickup Quality, Legroom, Brand, Service Quality, and Overall Product. The study uses primary data collected through a structured questionnaire in Google form. The data is collected from a total of 60 respondents who are users of hero electric bikes in the Bardoli region. In order to arrive at the main results, the statistical analysis tests such as Chi-Square test, Mann-Whitney test and Kruskal-Wallis test were applied.

Objectives

To examine the motive for buying an e-bike.
 To investigate the satisfaction of Hero e-bike users.
 To determine the intention of users to recommend electric bikes to others.

Hypothesis

 H_01 : There is no relationship between the motives for buying e-bikes and gender.

 H_02 : There is no relationship between the motives for purchasing e-bikes and educational attainment.

 H_03 : There is no significant difference in the satisfaction level of men and women.

 H_04 : There is no significant difference in satisfaction level between high and low speed.

 H_05 : There is no significant difference between satisfaction level and the model used.

 H_06 : There is no relationship between genders and recommendation of e-bikes.

 H_07 : There is no correlation between educational attainment and the recommendation of e-bikes

4. FINDINGS

This section analyses data from 60 users of the Hero e-bike in the city of Bardoli. It includes descriptive statistics such as frequency tables, chi-square, Mann-Whitney test, Kruskal-Wallis test, which lead to conclusions.

Particulars	Variables	Frequency	Percent
Gender	Male	36	60
	Female	24	40
Education qualification	HSC or below	15	25
	Graduate	35	58.3
	Post Graduate	10	16.7
Occupation	Student	17	28.3

 Table 1 Demographic Profile of Samples

	Self Employed	16	26.7
	Office/ Job	20	33.3
	Farmer	7	11.7
Monthly Income	Below 25,000	33	55
	25,000 - 50,000	9	15
	Above 50,000	18	30
Speed	High Speed	47	78.3
	Low Speed	13	21.7
Battery	Single Battery	40	66.7
	Dual Battery	20	33.3
Model	Optima	33	55
	Photon	14	23.3
	Flash	8	13.3
	Arena	5	8.3

Sample size=60

Table 1 shows the demographic profile of the respondents. The demographic profile such as gender, educational attainment, occupation, monthly income, speed, battery type and model of e-bike has an impact on the motive to buy e-bikes.

Table 2: Motive of Purchasing E-Bike

Motives	Frequency	Percent
Affordability	8	13.3
Environment safety	5	8.3
Rise in fuel price	34	56.7
Market trend	13	21.7

Table 2 represents the motive for purchasing an e-bike viz. Affordability, environment safety, rise in fuel price, and market trend. 56.7% of respondents prefer to buy e-bikes due to the rise in fuel prices and 21.7% of respondents purchase ebikes due to market trends. It indicates that still the issue of environmental safety and affordability of e-bikes is not considered for buying E-bike.

 Table 3: Cross tabulation of gender and motive of purchasing E-bikes

Gender	Affor dabili ty	Envir onme nt safety	Rise in fuel price	Mar ket tren d	Tot al	Pearson Chi Square test
Male	7	4	17	8	36	Value:34.
Female	1	1	17	5	24	Df: 3
Total	8	5	34	13	60	Asymp. Sig.(2 sided): 0.001

Ho1: there is no association between the motives of purchasing e-bike with gender

Table 3 shows that the null hypothesis is rejected because the p-value between gender and the motive for buying e-bikes is less than 0.05. This means that there is a relationship between gender and the motive for buying e-bikes. Both men and women give more importance to the purchase of e-bikes due to the high price of fuel. With the increase of fuel prices, people decide to buy e-bikes.

Table 4: Cross tabulation of education qualification and motive of purchasing E- bikes

Education	Affo rdab ility	Envir onme nt safety	Rise in fuel pric e	Mar ket tren d	To tal	Pearson Chi Square test
HSC or Below	0	1	9	5	15	Value:1 1.861 ^a
Graduate	6	1	21	7	35	Asymp.
Post Graduate	2	3	4	1	10	sig.(2 sided): 0.065
Total	8	5	34	13	60	

Ho₂: there is no association between the motives of purchasing e-bike with education qualification

From Table 4, it can be seen that the null hypothesis is accepted because the p-value between educational attainment and the motive for purchasing e-bikes is greater than 0.05. This means that there is no relationship between educational attainment and the motive for buying e-bikes. University graduates give more importance to the purchase of e-bikes due to the high price of fuel. With the increase of fuel price, people decide to buy e-bikes.

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Ho3: there is no significant difference in the satisfaction level of male and female.

Table 5 shows the measurement of customer satisfaction based on the selected variables such as affordability, appearance, loading time, speed, pickup quality, legroom, brand, service quality, and overall product between men and women. Mann Whitney test was applied to determine the significant difference between the satisfaction level of males and females. Since the significance value or p-value is greater than 0.05, the null hypothesis is accepted. This means that there is no difference between the satisfaction level of men and women in any of the variables.

Table 6: Mann Whitney U Test

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Ho₄: there is no significant difference in the satisfaction level of high speed and low speed.

Table 6 shows the measurement of customer satisfaction based on the variables considered such as affordability, appearance, loading time, speed, pickup quality, legroom, brand, service quality, and overall product between High Speed and Low Speed. Mann Whitney test was applied to determine the significant difference between the satisfaction level of High Speed and Low Speed. Since the significance value or p-value is less than 0.05, the null hypothesis is rejected. This means that a significant difference was found between the customers of high speed and low speed e-bikes for the variables of charging time, speed, pickup quality and overall product satisfaction.

Table 7: Kruskal- Wallis Test

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Hos: there is no significant difference in level of satisfaction and the model used.

Table 7 shows the difference in the degree of satisfaction with a preferred model. The satisfaction level was measured by the variables considered such as affordability, appearance, loading time, speed, pickup quality, legroom, brand, service quality, and overall product of the model used. The Kruskal-Wallis test is used to perform this analysis. Since the significance value or p-value is greater than 0.05, the null hypothesis is accepted. This means that there is no difference

in any of the variables between the satisfaction level of the model used.

Table 8:	Recommendation	of	E-	Bike
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	Frequency	Percent
Yes	44	73.3
No	16	26.7
Total	60	100

Table 8 shows that 73.3% of e-bike users would recommend electric bikes to others, while 26.7% would not recommend e-bikes to others. The e-bike users who are not completely satisfied are less likely to recommend others.

 Table 9: Cross Tabulation of Gender with E-Bike

 Recommendation

Gender	Yes	No	Total	Pearson Chi Square test
Male	26	10	36	Value:2.400 ^a
Female	18	6	24	Asymp. Sig.(2 sided): 0.121
Total	44	16	60	

H0₆: there is no association between the genders with recommendation of e-bikes.

Table 9 shows that the null hypothesis is accepted because the p-value between gender and e-bike recommendation is above 0.05. This means that there is no relationship between gender and recommendation of e-bikes. A total of 73.33% of the respondents will recommend ebikes.

 Table 10: Cross Tabulation of Education Qualification with

 E-Bike Recommendation

Education	Yes	No	Total	Pearson Chi Square test
HSC or Below	12	3	15	Value:17.500 ^a Df: 2
Graduate	24	11	35	Asymp. Sig.(2 sided): 0.001
Post Graduate	8	2	10	
Total	44	16	60	

H07: there is no association between the education qualifications with recommendation of e-bikes.

Table 10 shows that the null hypothesis is rejected because the p-value between educational attainment and ebike recommendation is less than 0.05. This means that there is a relationship between educational attainment and recommendation of e-bikes. A total of 73.33% of respondents will recommend e-bikes to others.

MOTIVE OF PURCHASING E- BIKE

The motive to buy an e-bike was measured by crosstabulation and chi-square of demographic variables, gender, and education level. The null hypothesis is rejected; there is a relationship between gender and the motive to buy an e-bike. The motive is the increase in fuel prices for both men and women. The null hypothesis is accepted when the motive to buy is measured by education level. No relationship is found. Only university graduates prefer to purchase e-bikes compared to university graduates and those with HSC degrees or lower. The null hypothesis is rejected for gender (p=0.001) and accepted for education level (p=0.065). The hypothesis is that the increase in fuel prices could increase the purchase of e-bikes. It was found that men and women have the same motive for buying e-bikes. According to the qualification, only academics attach more importance to the purchase of ebikes due to the motive of fuel price. People do not yet value the sustainability goals of environmental safety. Awareness of electric bike use needs to be raised. Affordability is also less considered, although the Indian government provides subsidies for the purchase of e-bikes.

CONSUMER SATISFACTION

Satisfaction levels were measured by applying the Mann-Whitney and Kruskal-Wallis tests with the demographic variables of gender, speed type, and model type. The null hypothesis is accepted; there is no significant difference between the satisfaction level of men and women. No difference in satisfaction with e-bike use was found between males and females. A significant difference in satisfaction was found between high-speed and low-speed bicycles in the factors of charging time, speed, pick-up quality, and overall product. The difference is that the charging time is longer, the speed is higher, and the pickup quality is better for the high-speed e-bikes than for the lowspeed e-bikes. Thus, the differences in opinion were found in these specific factors. When the level of satisfaction is measured with the type of model used, the null hypothesis is accepted and there is no difference in satisfaction with the use of the model of Hero e-bikes.

RECOMMENDATION OF HERO E-BIKES

Recommendation of e-bikes was related to gender and educational qualification. The chi-square test was used to find a relationship. No relationship was found between electric bike recommendations and gender. A relationship was found between education level and recommending e-bike users. 73.3% of respondents will recommend others to buy a Hero e-bike.

CONCLUSION

This study focuses on consumers' motives for purchasing e-bikes and on the satisfaction of Hero e-bike users. The motive for buying e-bikes mainly depends on the increased fuel prices and the market trend; it does not matter whether the buyer belongs to a certain gender. Consumers' focus is more on fuel price rather than environmental safety. The satisfaction level of male and female consumers is the same. In terms of e-bike users' satisfaction with the type of speed, there are differences in the factors of charging time, pick-up quality, speed, and overall product; there are no differences in any other factors. When it comes to recommending e-bikes, consumers still do not give a 100% recommendation. This means that still 26% of respondents are not satisfied. So the company needs to focus more on the satisfaction of the users of its e-bikes.

The analysis indicates that in the Bardoli city, the users of e-bikes are limited. The company can increase the number of its customers through appropriate advertising, providing government subsidies, raising awareness about environmental sustainability, and presenting the different models along with the other traditional bikes. The competitors for Hero electric bikes are also limited, so the company can use the Hero brand name to increase its number of customers. The motive of users is still based on two criteria, mainly the increase of fuel prices and market development. Hero e-bikes can increase its customer base with the help of its users, who are eager to recommend e-bikes to others. So in the near future, the users of e-bikes will increase.

FURTHER SCOPE OF THE STUDY

The wider scope of the study includes those things that were not included in this paper. - The study focuses only on the specific region of Bardoli, including the purchase motive, satisfaction level and recommendation. Here, the level of consumer awareness has not yet been studied, which helps to know the requirements for the use of Hero electric bicycles. Customers' perception can also be checked in different regions.

• The variables for the motive to buy e-bikes can also be analyzed with the demographic data using government subsidies, sustainable environment, noise pollution control, easy charging, etc.

• In this study, only Hero's electric bike was considered, so for further analysis, other competitors can be studied and even comparative analysis can be done. Okinawa Autotech has covered the market with its diverse range of electric bikes or scooters.

To increase satisfaction and change the motives of future users, the company can conduct awareness programme and demonstrate e-bikes to customers. They can focus more on showing the benefits of government subsidies and targeting young and older people. The company can take advantage of its brand name and increase its customer base. Awareness can be increased through digital advertising in the form of posts on social media and in printed form

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