

Multiple Regression Analysis on the Physical and Perceived Attributes of Quezon City Free Bus Service to Passenger Satisfaction

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Abstract

In the Philippines, the daily commute of Filipinos has always been a challenge, even before the pandemic. The Covid-19 pandemic has substantially impacted the public transportation sector and made commuting even more challenging. The Quezon City Bus Service or QCity Bus Service is one of the initiatives developed by the Quezon City government to alleviate the challenges brought about by the pandemic by providing free bus rides. The study aims to identify factors that influence passengers' satisfaction and determine how physical and perceived attributes impact passenger satisfaction to present relevant findings and recommendations that can help construct a more effective and strategic administration of free public transportation services. The physical attributes considered in this study were reliability, frequency, speed, accessibility, information provision, ease of transfers/interchanges, and vehicle condition. On the other hand, comfort, safety, convenience, and aesthetics were the perceived attributes used in this study. A total of one hundred fifty (150) respondents were taken from commuters who avail of the QCity Bus Service. The questionnaire was categorized into two parts: socio-demographic information and satisfaction rating. The researchers used a 5-point Likert scale to evaluate and quantify the passengers' satisfaction with the physical and perceived attributes and overall satisfaction with the QCity Bus Service. Correlation and multiple regression analysis will be used to analyze data. The research aims to test the claim that physical attributes have a significant relationship with passenger satisfaction and that perceived attributes have a significant relationship with passenger satisfaction at $\alpha = 0.05$ level of significance.

Keywords

Physical Attributes, Perceived Attributes, Passenger Satisfaction, QCity Bus Service, Public Transportation

1. Introduction

The worldwide pandemic caused by the widespread transmission of the SARS-Cov-2 virus (World Health Organization, 2020) magnified major issues in the country, particularly concerning public transportation. With the rapid surge of coronavirus cases in the country, the entire Luzon was placed under an enhanced community quarantine (Geducos and Kabling, 2020). In the first quarter of 2020, only personal cars and authorized business vehicles for employees were permitted to travel following the strict restrictions on the transportation system enacted in the country. Eventually, when the number of positive cases was decreased and regulated, the lockdown gradually eased, which lifted travel and mobility restrictions, allowing the resumption of economic activities and limited operation of public transportation (Geducos and Jazul, 2020). According to Jiang et al. (2022), urban mobility in Metro Manila decreased dramatically in response to COVID-19 lockdowns, by up to 85%. Moreover, even months after the strictest restrictions were lifted, national mobility remained almost 30% lower than it had been before the lockdown. The daily commute of Filipinos, particularly those in Metro Manila, which has always been challenging, became even more difficult compared to before the outbreak. Thus, the local government units launched several initiatives for people to cope with the impact of the pandemic.

The Quezon City Bus Service or QCity Bus Service has proven to be a dependable mode of public transportation for the city's residents and visitors. According to Nievera (2022), Mayor Joy Belmonte stated that the priority of the city is to give free, safe, and efficient public transportation. The program aims to aid in reducing the commuters' financial burden in the face of a health crisis, inflation, and rising gasoline costs by providing them with free bus rides through its QCity Buses. Additionally, it will help in reducing traffic congestion in the city as the buses run on a set timetable and only make stops at set pick-up and drop-off locations throughout their routes (Quezon City Government, 2021). In line with this, the Productivity and Development Center (2022) mentioned that an effective organization that provides the public with goods or services is one that places importance on client satisfaction.

According to Sukhov et al. (2021), research has shown that high-quality public transportation contributes to higher overall travel satisfaction. This study's objective is to present substantial information about QCity Bus attributes and passenger satisfaction that can lead to more strategic implementations of public transportation systems and satisfaction of the passengers' needs and wants. The study sought to identify the quality attributes of the QCity Bus that influence passengers' satisfaction. The researchers also aimed to determine how these attributes affect passenger satisfaction. The research has significant implications for making effective decisions in the future, and the general ridership may be a significant driver for improvement in public transportation in the Philippines even after the pandemic.

1.1 Objectives

The researchers will identify the level of satisfaction of passengers with the physical and perceived attributes of free public transportation in Quezon City. The research aims to help the researchers improve their understanding of the relationship between passengers' satisfaction and the physical and perceived attributes of free public transport. Furthermore, this study will also provide knowledge or relevant contributions to previous research with regard to free public transportation in the Philippines.

1. What is the profile of the respondents in terms of age, sex, and occupational status?
2. What physical attributes influence the passengers' satisfaction with Quezon City's free bus service?
3. What perceived attributes influence the passengers' satisfaction with Quezon City's free bus service?
4. Is there a significant relationship between physical attributes to the passengers' satisfaction with Quezon City's free bus service?
5. Is there a significant relationship between perceived attributes to the passengers' satisfaction with Quezon City's free bus service?
6. Can a passenger satisfaction model be derived from the above correlations?

Hypothesis 1

H_{01} : There is no significant relationship between the physical attributes and passenger satisfaction.

H_{a1} : There is a significant relationship between the physical attributes and passenger satisfaction.

Hypothesis 2

H_{02} : There is no significant relationship between the perceived attributes and passenger satisfaction.

H_{a2} : There is a significant relationship between the perceived attributes and passenger satisfaction.

1.2 Theoretical and Conceptual frameworks

This study is based on research on the quality attributes of public transportation and its relationship to passenger satisfaction. The study also adds to existing research by providing new understanding and advancement in the theory of public transport satisfaction. The Figure below shows that there are two categories of quality attributes in public transportation. The literature review serves as the basis for the variables. The theory holds that the two attributes that are shown as independent variables in the diagram directly influence customer satisfaction. According to Redman et al. (2013), the Figure 1 suggests that there is a relationship between the physical (reliability, frequency, speed, accessibility, information provision, ease of transfer, and vehicle condition) and perceived (comfort, safety, convenience, and aesthetics) attributes and customer satisfaction.

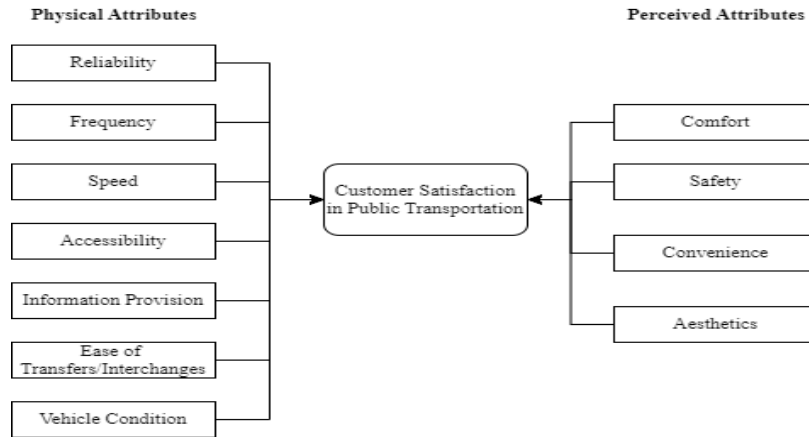


Figure 1. Theoretical framework

The Figure 2 below illustrates the research paradigm developed using the input-process-output model as grounds. It provides a structured approach to how the variables come together by indicating the list of inputs necessary to produce the desired results, as well as how the output may be assessed.

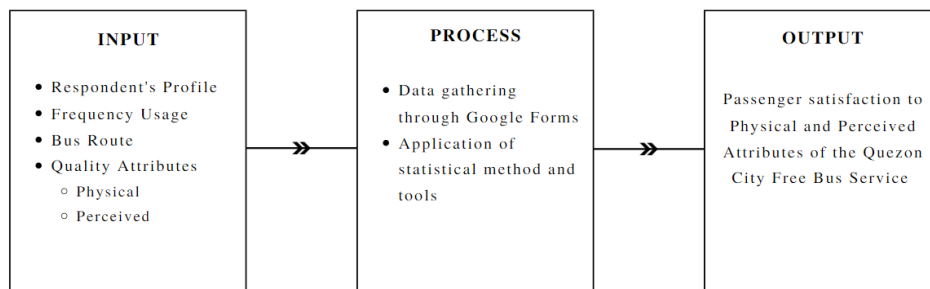


Figure 2. Conceptual framework

1.3 Scope and Limitations of the study

The study will limit its focus to determining the physical and perceived factors and how they impact passenger satisfaction. The research respondents will be confined to passengers of the Quezon City Free Bus Service. The survey questionnaire will be disseminated virtually via online means to avoid physical contact and for the safety of both researchers and respondents. The scope of the study will target the Quezon City Area. Moreover, the researchers will use Minitab to analyze the value or impact (p-value correlation) of each factor on passenger satisfaction. To evaluate the significant relationship between the variables' physical and perceived factors to passenger satisfaction, the researchers will utilize the PLS-SEM model (path coefficients).

1.4 Significance of the study

The findings of this study will be benefit passengers, as it will provide additional knowledge and information about the free bus service. The study will allow commuters to be aware of the factors that affect their satisfaction when taking the Quezon City Free Bus Service. It will be beneficial to the local government of Quezon City regarding satisfying its citizens by means of providing a quality service relating to public transportation. Furthermore, it will assist researchers in analyzing data while using various IE tools and methods. Additionally, the study will educate researchers about the relationship between perceived attributes, physical attributes, and passenger satisfaction, allowing them to determine whether those factors have a substantial impact on passenger satisfaction. The research findings can serve as a reference and guide to future researchers who plan to conduct the same experimental study or any study in relation to this topic about qualities or factors that contribute to the passenger satisfaction of Quezon City Free Bus Service.

2. Literature Review

The execution of a Bus Augmentation Program within Quezon City's territorial jurisdiction is the City's adequate and practical response to these traffic congestion issues, according to the Quezon City Bus Augmentation Program (2021). The Quezon City Bus Augmentation Program, popularly known as the Q City Bus Service, has served about 80,000 commuters weekly since it began in December 2019. For city inhabitants and visitors alike, the Q City Bus Service has proven to be a dependable form of public transit. The program offers commuters a free trip and will service 5.3 million people as of March 18, 2022 (Gutierrez, 2022). It is known that transportation is essential to our socioeconomic existence. Given the significance of transportation in our everyday lives, the Philippines continues to struggle with its transportation system's efficiency, particularly in its densely populated metropolitan areas like Metro Manila. However, the Philippine Development Plan estimates traffic congestion damages the economy by at least \$53.6 million daily or around \$18 billion annually in 2014.

To handle this pressing issue, the sector must receive the required assistance. Since the cost of using the Metro's public transportation system significantly impacts the majority's ability to purchase goods, as well as the rising prices of essentials as reflected in inflation, cost-free transportation options like the accessible MRT, and EDSA Carousel ride undoubtedly benefit many commuters (Beldad, 2022). The struggle of Filipino commuters in transportation in modern society relies on mass transportation. Filipinos from all walks of life, mainly commuters, constantly complain about being late for work by wasting time sitting in traffic. Students waste valuable time by sitting in a car stuck in traffic for hours or lining up at a bus, jeepney, or train stop in heavy rain. According to the Metro Manila Development Authority (2018), the Philippines is losing P3.5 billion in potential income daily as traffic congestion worsens. If the problem will not be resolved, the figure is expected to increase to P5.4 billion by 2035. Approximately millions of students, according to the Philippine Statistics Authority, rely on public transportation to get to school.

With the traffic congestion in Metro Manila, students who commute daily to get to school often affect their both personal and academic life. The following are the effects of traffic on students: (1) Substandard performance, (2) pressure on personal relationships, and (3) mental and physical exhaustion (Effects of Traffic to Students in the Philippines, 2020). Daily commuting has been a challenge for workers in the Philippines, especially during peak hours. In a survey conducted by Social Weather Stations (2020), forty-two percent (42%) of non-home-based workers said that getting to work is more difficult than it was before. Nineteen percent (19%) of respondents said that getting to work is slightly more difficult because of the health crisis, eleven percent said it is slightly harder, and a fourth, or twenty-eight percent said that going to work remains consistent as before. In general, the drawbacks of travel can include greater risks for personal safety and traffic safety, exposure to air pollution and noise, and community severance (Frank et al., 2019; Glazener et al., 2021).

Several studies show that having long commuting times and distances can cause related health problems such as lack of physical activity and sleep quality, hypertension, mental stress and anxiety, lack of motivation and enthusiasm, and negative mood that leads to unhappiness (Lyons and Chatterjee, 2008; Abou-zeid, 2009; Oliveira et al., 2015; Kunn Nelen, 2016; Wheatley, 2014; Wu, 2016). Additionally, long-distance commutes, particularly those lasting more than 60 minutes, not only cause personal health concerns but also restrict the time available for physical activities (Ettema et al., 2010; Wang, 2020). Luna (2022) mentioned that in the transportation advocacy network, most commuters in the Greater Metro Manila Area think they wait too long for a ride because there need to be more public utility vehicles on the road to meet the present demand from passengers. According to poll results, 96% of respondents disagree that there are enough PUVs, including buses and jeepneys, on the road to accommodate commuters. In comparison, 79% of respondents believe their wait time for a ride is typically too long. The passenger's satisfaction with public transportation depends on specific quality attributes. Physical attributes are measured in terms of reliability, frequency, speed, accessibility, information provision, ease of transfer, and vehicle condition, while perceived attributes are measured in terms of comfort, safety, convenience, and aesthetics (Redman et al., 2013).

3. Methods

This research study is quantitative in nature, emphasizing measurements and statistical analysis of collected data to ascertain the relationship between variables. Physical and Perceived attributes in the use of Quezon City Free Bus Service are the independent variables of the study, while the dependent variable is passenger satisfaction. The respondents of the study are students and workers who ride the Quezon City Free Bus Service. Judgment sampling was employed as there are predefined requirements and a limited number of individuals who have the knowledge needed by the researchers. According to Fleetwood (2018), the execution time for judgment sampling is as short as

possible. It allows researchers to directly address their target market and displays data in nearly real-time. Furthermore, a non-probability sampling technique known as judgmental sampling selects the sample members solely based on the researcher's expertise and judgment. Cochran's formula will be used to identify the appropriate sample size for determining the respondents for this research.

Equation 1:

$$n_0 = \frac{Z^2 pq}{e^2}$$
$$n_0 = \frac{(1.96)^2(0.5)(0.5)}{(0.08)^2} = 150$$

Based on the calculation shown above, the target number of respondents for this study will be 150 samples. The degree of confidence level was set at 95% with a margin of error of 8%, due to the limitations brought by the pandemic. The researchers used online Google forms to disseminate the survey questionnaire since the method is more convenient during this pandemic. The collected data can be automatically entered into a spreadsheet. For the data collection technique, the researchers will create Google Forms survey questionnaires that will be filled out by respondents. The questionnaire's format was taken from a study by Wong et al. (2017), while the list of attributes and their definitions were taken from a study by Redman et al. (2019). There are 5 sections in the questionnaire. The first section briefly discussed the purpose of the study, as well as what the respondents can anticipate while responding to the survey. The second section contains the privacy consent agreement where respondents can decide whether they agree to conditions like disclosing personal data. The third section contains the respondent's profile or demographics such as age, sex, place of residence, occupation, frequency of usage of Qcity Bus, and routes they take. The fourth section involves a five-point Likert scale rating for both physical and perceived features and it asks respondents to rate their level of satisfaction. The fifth and final section of the survey contains a closure statement thanking the respondents and assuring them that the information they provided will be kept private and used for academic purposes. The 10-item survey can be completed in as little as 2-3 minutes.

In order to interpret the data gathered from the respondents, listed below are the following statistical method that the proponents will be used:

A. Statistical Program

Statistical methods such as correlation, and multiple regression are also embedded into this software, which is why the researchers have chosen Minitab software as their statistical program. Minitab is known to be a software widely used in industries also it includes tools that can assist students and practitioners in systematically selecting the appropriate technique to analyze data and interpret the results (Ahmad, 2019).

B. Descriptive Statistics

The researchers will utilize the measures of central tendency to identify, understand, and interpret data. The central tendency allows the researchers to associate the overall satisfaction score or rating of all respondents to the survey. The mean is used to calculate the average of the data that were gathered. At the same time, the mode is known to be the most frequent number or satisfaction rate that may be experienced by passengers. Sharma (2019) stated that descriptive statistics is a statistical tool utilized to describe the behavior of a sample of data. When combined with various graphic analyses, descriptive statistics make up a significant portion of any quantitative data analysis.

C. Multiple Regression Analysis

The researchers will make use of multiple regression analysis as it will help the researchers in determining the relationship between the independent variables and dependent variables. Multiple regression analysis enables researchers to assess and interpret the strength of the relationship between an outcome of the dependent variable with several predictor variables, as well as the significance of each predictor to the relationship, frequently with the effect of other predictors statistically eliminated (Petchko, 2018).

D. Partial Least Squares - Structural Equation Modeling (PLS-SEM)

PLS-SEM will be used to visually assess the cause-and-effect relationship between the existing variables. According to Ravand et al (2016) PLS-SEM is a nonparametric technique that requires no distributional assumptions and may be computed using small sample sizes. Its goal is to maximize the explained variance

of dependent variables using an ordinary least squares estimation approach. Moreover, the structural Equation Model (SEM) is a field of statistical study that can test a series of relationships that are relatively difficult to measure simultaneously.

4. Data Collection

The first step would be to conduct a thorough investigation or in-depth investigation because it enables the researchers to read a great number of research papers and studies to determine which research areas have issues. Second, the problem's identification is crucial because it enables researchers to comprehend its importance and be aware of the methods that can be used to solve it. The third phase will involve using a sampling and data collection tool. Researchers will use the convenience sample technique in this step. The sample size for this study will be determined by applying Cochran's formula. The platform for data collection will be Google forms, where passengers may share their demographic information as well as the components that influence their satisfaction while riding the bus. The fourth step would be data and result in analysis, during which the researchers would use programs like Minitab, multiple regression, descriptive statistics, and PLS-SEM. In the fifth step, the researchers will present their findings and recommendations along with the results of the analysis. The overview of the data collection procedure employed in this research article is shown in Figure 3 below:

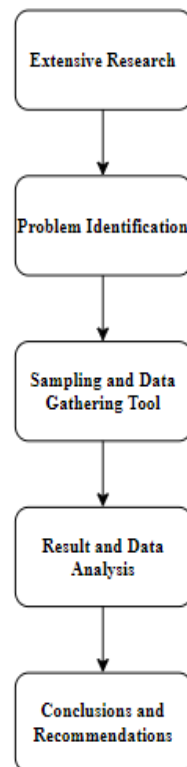


Figure 3. Data gathering procedure

5. Results and Discussion

5.1 Numerical Results

Table 1 shows the collected profile of the passengers of the QCity Bus. The results show that the majority of the respondents are male (n=80, 53.3%), and the ages largely range from 10-25 years old (n=80, 53.3%). Most of the respondents are employed (n=66,44%), and the majority reside in Quezon City (n=99, 66%). Most passengers ride the QCity Bus 1-2 times a week (n=71, 47.3%), and the route that is most taken is Route 1: Quezon City Hall to Cubao and vice versa (n=84, 28.2%) (Table 1).

Table 1. Demographic profile of the respondents (n=150)

Characteristics	Number of Respondents	
	Frequency	Percentage
Sex		
Male	80	53.3%
Female	70	46.7%
Age		
10 - 25 years old	80	53.3%
26 - 41 years old	61	40.7%
42 - 57 years old	7	4.7%
58 - 67 years old	2	1.3%
Occupational Status		
Student	61	40.7%
Employed	66	44.0%
Unemployed	18	12.0%
Others	5	3.3%
Place of Residence		
Quezon City	99	66.0%
Marikina City	15	10.0%
Rizal	11	7.3%
Caloocan City	7	4.7%
Manila City	5	3.3%
Bulacan	4	2.7%
Valenzuela City	2	1.3%
Pasig City	2	1.3%
Laguna	1	0.7%
Parañaque City	1	0.7%
Tagaytay City	1	0.7%
Others	2	1.3%
Frequency Usage of Quezon City Bus Service		
Daily	15	10.0%
1-2 times a week	71	47.3%
3-4 times a week	39	26.0%
5-6 times a week	14	9.3%
Others	11	7.3%
Routes of the Passengers they usually ride		
Route 1: Quezon City Hall to Cubao	84	28.2%
Route 2: QC Hall to Litex /IBP Road	36	12.1%
Route 3: Welcome Rotonda to Aurora Katipunan	46	15.4%
Route 4: QC Hall to General Luis	19	6.4%
Route 5: QC Hall to Mindanao Ave. via Visayas Ave.	32	10.7%
Route 6: QC Hall to Gilmore	16	5.4%
Route 7: QC Hall to C5 / Ortigas Ave. Ext.	35	11.7%
Route 8: QC Hall to Muñoz	30	10.1%

Table 2 shows the ANOVA summary table using Minitab Statistical Software. In terms of Physical Attributes, reliability, ease of transfer ($P < .001$), frequency ($P = .001$), and accessibility ($P = .006$) are the statistically significant factors, and the correlation is different from 0, while comfort, aesthetics ($P < .001$), and convenience ($P = .007$) are the statistically significant factors in terms of Perceived Attributes and the correlation is different from 0, as their p-values are less than 0.05. The results also suggest that at least one of the physical attributes and at least one of the perceived attributes are useful for predicting overall passenger satisfaction since the regression p-values $< 0.001 \leq 0.05$. Moreover, the results for Adjusted R-squared indicate that 66.72% of the changes in passenger satisfaction is explained by physical attributes, whereas 53.45% of the changes in passenger satisfaction is explained by perceived attributes.

Table 2. Analysis of variance (ANOVA) of respondents

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Physical Attributes					
Regression	7	142.501	20.3573	43.67	0.000
Reliability	1	5.94	5.9402	12.74	0.000
Frequency	1	5.166	5.1661	11.08	0.001
Speed	1	0.495	0.4945	1.06	0.305
Accessibility	1	3.656	3.6556	7.84	0.006
Information Provision	1	0.146	0.1456	0.31	0.577
Ease of Transfer	1	13.43	13.4303	28.81	0.000
Vehicle Condition	1	0.095	0.0946	0.2	0.653
Error	142	66.193	0.4661		
Lack-of-Fit	119	64.359	0.5408	6.79	0.000
Pure Error	23	1.833	0.0797		
Total	149	208.693			
Perceived Attributes					
Regression	4	114.156	28.5391	43.77	0.000
Comfort	1	9.82	9.8196	15.06	0.000
Safety	1	0.399	0.399	0.61	0.435
Convenience	1	4.912	4.9124	7.53	0.007
Aesthetics	1	9.945	9.9453	15.25	0.000
Error	145	94.537	0.652		
Lack-of-Fit	72	57.301	0.7958	1.56	0.03
Pure Error	73	37.236	0.5101		
Total	149	208.693			
Variables		S	R-sq	R-sq(adj)	R-sq(pred)
Physical Attributes		0.682748	68.28%	66.72%	63.55%
Perceived Attributes		0.807452	54.70%	53.45%	50.92%

Table 3. Descriptive statistics of the level of satisfaction to physical and perceived attributes and overall service quality

Variable	Mean	StDev	Mode	N for Mode
Physical Attributes				
Reliability	3.38	1.0341	4	55
Frequency	3.1933	1.0973	4	55
Speed	2.9067	1.1372	2	45
Accessibility	3.0533	1.11	2	48
Information Provision	3.1533	1.0975	3	45
Ease of Transfer	2.9133	1.1169	2	55
Vehicle Condition	3.0267	1.0803	2	46
Perceived Attributes				
Comfort	3.3733	1.1443	4	52
Safety	3.4867	1.0728	4	47
Convenience	3.1933	1.1094	2	47
Aesthetics	3.0267	1.0615	2	50
Overall Service Quality	3.0933	1.1835	2	42

Table 3 shows the passengers' level of satisfaction with the quality attributes and overall service quality of QCity Bus. For the physical attributes, reliability obtained the highest average score (\bar{x} =3.38) with a modal score of 4 (n=55). On the other hand, speed obtained the lowest average score (\bar{x} =2.91) with a modal score of 2 (n=45). For the perceived attributes, safety obtained the highest average score (\bar{x} =3.49) with a modal score of 4 (n=47), whereas aesthetics obtained the lowest average score (\bar{x} =3.03) with a modal score of 2 (n=50). The modal score for overall satisfaction is 2 (n=42), indicating that respondents are most frequently dissatisfied. The average score for overall satisfaction is 3.09 with a standard deviation of 1.18, indicating that the respondents are generally neutral about the service quality of the QCity Bus.

5.2 Graphical Results

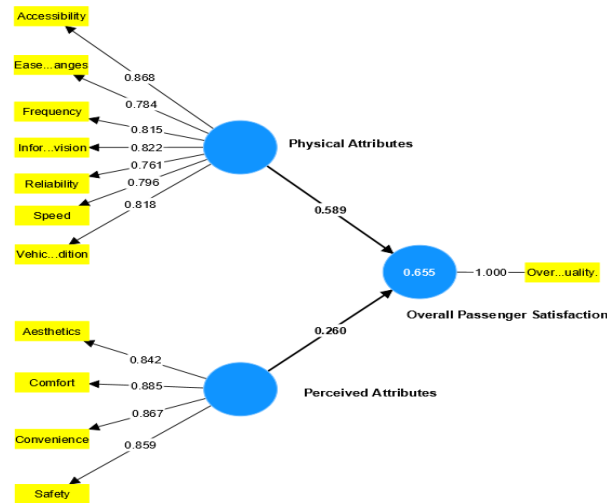


Figure 1. PLS-SEM model

The model above consists of an inner and outer model (Figure 1). The inner model consists of the path coefficients while the outer model consists of the outer weights/loadings. The outer model is a measurement model that shows the reliability and validity of the indicators with its underlying construct. The relationship between the variables in the inner model will be statistically significant if the path coefficient values are greater than 0.1. According to the admin of HKT consultant (2021), the relationship between the variables is not statistically significant if the path coefficient value is less than 0.1. The path coefficient value of perceived attributes ($0.260 > 0.1$) shows the path relationship between perceived attributes and overall passenger satisfaction is statistically significant. Furthermore, the path coefficient value of physical attributes ($0.589 > 0.1$), shows the path relationship between physical attributes and overall passenger satisfaction is statistically significant. However, the inner model suggests that the physical attributes with a path coefficient value of 0.589 have the strongest effect on overall passenger satisfaction. Hair et al. (2014) suggested that the (standardized) outer loadings should be 0.708 or higher and that all indicators' outer loadings should at least be statistically significant. The outer loadings in the outer model above indicate that all values are significant and valid as they are greater than 0.708.

5.3 Proposed Improvements

The results of this study should be taken into consideration in assessing ways to improve the free bus transportation in Quezon City, and if possible, can be offered and implemented in highly dense Metropolitan areas to provide a much more convenient and cost-free transportation to commuters in the Philippines. There are several limitations in this study that can be explored and considered to provide more understanding regarding free transportation. For future researchers who ought to study similar research about this paper, they can consider contextual factors such as socio-economic status, age, and sex since this could affect a variety of related health habits which can be considered in the assessment of health or satisfaction of the commuters. The study also limits to Quezon City only. In order to gain more accurate data, researchers must not limit themselves in getting respondents from Quezon City. They can include other cities that offer free bus transportation. Next, the authors limit the study to free bus transportation. Future researchers can get further perceptions or insights of the commuters in the Philippines if they include another mode

of transportation that is offering free services to the public commuters. Furthermore, if possible, future researchers should try to physically survey or interview passengers, as there is also a limitation of responses when being surveyed via online means. The authors suggest involving persons with disabilities (PWD), senior citizens, etc., in future studies. Lastly, this study used a five Likert scale rate as part of their survey questionnaire wherein there is a neutral option that makes the responses relatively imprecise due to having a neutral decision to choose from. The authors suggest utilizing an even-numbered Likert scale rate in order to acquire more definite responses.

6. Conclusion

To determine the relationship between quality attributes and satisfaction and identify the significant variables that affect passengers' satisfaction with the Quezon City free bus service, is the goal of this study. The researchers were able to successfully gather data from respondents by conducting an online survey. Different statistical methods were used to evaluate the relationship between variables. To summarize, the results show that:

1. The majority of the respondents are men, and their ages typically range from 10 to 25. The majority of respondents work, and most of them live in Quezon City. The majority of riders utilize the QCity Bus 1-2 times a week, and Route 1 is the most frequently traveled route.
2. The researchers found that reliability, frequency, accessibility, and ease of transfer are Physical Attributes that greatly influence passengers' satisfaction with Quezon City's free bus service.
3. Comfort, convenience, and aesthetics are Perceived Attributes that greatly influence passengers' satisfaction with Quezon City's free bus service.
4. H_{01} is rejected and H_{a1} is accepted, thus concluding that there is a significant relationship between physical attributes and the passengers' satisfaction with Quezon City's free bus service.
5. H_{02} is rejected and H_{a2} is accepted, thus concluding that there is a significant relationship between perceived attributes and the passengers' satisfaction with Quezon City's free bus service.
6. Based on the findings above, the researchers created the PLS-SEM figure that also serves as the passenger satisfaction model. There is a statistically significant relationship between both perceived and physical attributes and the passengers' satisfaction with Quezon City's free bus service, as shown by the PLS-SEM model, that every numerical value in the inner and outer models exceeds the required standard value.

This study aims to provide comprehensive data about the correlation between Quezon City Bus Service attributes and customer satisfaction that can influence how strategically public transportation systems are implemented and how well passengers' requirements and wants are achieved. The study could potentially benefit both passengers and the local/national government since it evaluates and determines the factors that affect passenger satisfaction in Quezon City, thus providing a new perception of the free Bus Service administered by the Quezon City Government. Given the significance of transportation in our everyday lives, improving system efficiency in the Philippines remains an extreme challenge. The results may be utilized by the national and/or local government units (LGUs), Metropolitan Manila Development Authority (MMDA), non-governmental organizations (NGO), etc. who seek to provide their fellow countrymen with efficient and convenient public transportation. Implementers of free public transportation services may consider factors such as reliability, frequency, accessibility, ease of transfer, comfort, convenience, and aesthetics to fulfill and satisfy passengers' physical and perceived demands and deliver a higher overall satisfaction with their service.

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