

The copyright © of this thesis belongs to its rightful author and/or other copyright owner. Copies can be accessed and downloaded for non-commercial or learning purposes without any charge and permission. The thesis cannot be reproduced or quoted as a whole without the permission from its rightful owner. No alteration or changes in format is allowed without permission from its rightful owner.



PURCHASE INTENTION OF ELECTRIC VEHICLE AMONG GEN-X

SHEIKH MUHAMMAD AL-AZIM BIN SHEIK MUJIBU RAHMAN



**MASTER OF SCIENCE (TRANSPORTATION AND LOGISTICS MANAGEMENT)
UNIVERSITI UTARA MALAYSIA
MARCH 2023**

PURCHASE INTENTION OF ELECTRIC VEHICLE AMONG GEN-X

By

SHEIKH MUHAMMAD AL-AZIM BIN SHEIK MUJIBU RAHMAN



**Thesis Submitted to
College of Business
Universiti Utara Malaysia,
In Partial Fulfilment of the Requirement for the
Master of Science (Transportation and Logistics Management)**



Kolej Perniagaan
(College of Business)
Universiti Utara Malaysia

PERAKUAN KERJA TESIS / DISERTASI
(Certification of thesis / dissertation)

Kami, yang bertandatangan, memperakukan bahawa
(We, the undersigned, certify that)

SHEIKH MUHAMMAD AL-AZIM BIN SHEIK MUJIBU RAHMAN

calon untuk Ijazah **MASTER OF SCIENCE (TRANSPORTATION & LOGISTICS MANAGEMENT)**
(candidate for the degree of)

telah mengemukakan tesis / disertasi yang bertajuk:
(has presented his/her thesis / dissertation of the following title)

PURCHASE INTENTION OF ELECTRIC VEHICLE AMONG GEN-X

seperti yang tercatat di muka surat tajuk dan kulit tesis / disertasi.
(as it appears on the title page and front cover of the thesis / dissertation).

Bahawa tesis/disertasi tersebut boleh diterima dari segi bentuk serta kandungan dan meliputi bidang ilmu dengan memuaskan, sebagaimana yang ditunjukkan oleh calon dalam ujian lisan yang diadakan pada:

03 April 2024.

(That the said thesis/dissertation is acceptable in form and content and displays a satisfactory knowledge of the field of study as demonstrated by the candidate through an oral examination held on:

03 April 2024.

Pengerusi Viva
(Chairman for Viva)

: **Dr. Wadi Khalid bin Anuar**

Tandatangan
(Signature)

Pemeriksa Dalam
(Internal Examiner)

: **Dr. Wadi Khalid bin Anuar**

Tandatangan
(Signature)

Pemeriksa Dalam
(Internal Examiner)

: **Dr. Izatul Husna binti Zakaria**

Tandatangan
(Signature)

Tarikh: **03 April 2024**
Date:

Nama Pelajar
(Name of Student)

: **Sheikh Muhammad Al-Azim bin Sheik Mujibu Rahman**

Tajuk Tesis / Disertasi
(Title of the Thesis / Dissertation)

: **Purchase Intention of Electric Vehicle Among Gen-X**

Program Pengajian
(Programme of Study)

: **Master of Science (Transportation & Logistics Management)**

Nama Penyelia/Penyelia-penyelia
(Name of Supervisor/Supervisors)

: **Dr. Nooraini binti Ismail**


Tandatangan

Nama Penyelia/Penyelia-penyelia
(Name of Supervisor/Supervisors)

:

Universiti Utara Malaysia

Tandatangan

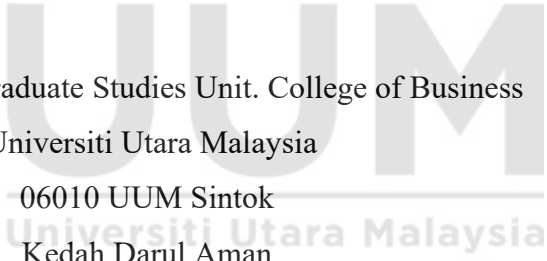
PERMISSION TO USE

In presenting this dissertation/project paper in partial fulfillment of the requirements for a Post Graduate degree from the Universiti Utara Malaysia (UUM). I agree that the library of this university may make it freely available for inspection. I further agree that permission for copying this dissertation/project paper in any manner, in whole or in part, for scholarly purposes may be granted by my supervisor(s) or in their absence, by the Director of Postgraduate Studies Unit. College of Business where I did my dissertation/project paper. It is understood that any copying or publication or use of this dissertation/project paper parts of it for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to the UUM in any scholarly use which may be made of any material in my dissertation project paper.

Request for permission to copy or to make other use of materials in this dissertation/project paper in whole or in part should be addressed to:



Director of Postgraduate Studies Unit. College of Business
Universiti Utara Malaysia
06010 UUM Sintok
Kedah Darul Aman



ABSTRACT

An electric vehicle (EVs), categorized as a mode of transportation that operates using electrical power, runs on an electric motor. This motor derives its energy from either batteries or fuel cells instead of gasoline or diesel-powered engines used in conventional vehicles. To cater to diverse driving demands, there are three types of EVs which include the all-electric model, plug-in hybrid variant, and fuel cell type. Despite being relatively expensive than traditional internal combustion engine cars, even though this gap is beginning to close off lately; cost continues to be one significant obstacle for their adoption by potential consumers. This paper aims to model electric vehicle purchase intention among Generation X consumers in an emerging market. Furthermore, the price value, perceived risk, environmental concern, and infrastructure barrier on the intention to purchase electric vehicles were examined. A total of 400 usable data were collected from Generation X respondents in Malaysia using structured questionnaires. This study utilizes the theory of planned behaviour (TPB) namely price value, perceived risk, environmental concern, and infrastructure barrier to better explain EV purchase intention among the Generation X consumers. As for the result, only one of the independent variables has a significant relationship with the dependent variable. Through this study, it will understand the purchase intention of choosing an electric vehicle.

Keywords: Intention to purchase, electric vehicle, Generation X, Malaysia.

ABSTRAK

Kenderaan elektrik (EV), yang dikategorikan sebagai mod pengangkutan yang beroperasi menggunakan kuasa elektrik, berjalan pada motor elektrik. Motor ini memperoleh tenaganya sama ada daripada bateri atau sel bahan api dan bukannya enjin berkuasa petrol atau diesel yang digunakan dalam kenderaan konvensional. Untuk memenuhi permintaan pemanduan yang pelbagai, terdapat tiga jenis EV yang termasuk model semua elektrik, varian hibrid *plug-in* dan jenis sel bahan api. Walaupun agak mahal daripada kereta enjin pembakaran dalaman tradisional, walaupun jurang ini mula ditutup sejak kebelakangan ini; kos terus menjadi satu halangan penting untuk diterima pakai oleh bakal pengguna. Kertas kerja ini bertujuan untuk memodelkan niat pembelian kenderaan elektrik dalam kalangan pengguna Generasi X dalam pasaran baru muncul. Tambahan pula, nilai harga, persepsi risiko, kebimbangan alam sekitar, dan halangan infrastruktur mengenai niat untuk membeli kenderaan elektrik telah diperiksa. Sebanyak 400 data boleh guna telah dikumpul daripada responden Generasi X di Malaysia menggunakan soal selidik berstruktur. Kajian ini menggunakan teori tingkah laku terancang (TPB) iaitu nilai harga, persepsi risiko, kebimbangan alam sekitar, dan halangan infrastruktur untuk menerangkan dengan lebih baik niat membeli kereta elektrik dalam kalangan pengguna Generasi X. Bagi keputusan, hanya satu daripada pembolehubah bebas yang mempunyai hubungan yang signifikan dengan pembolehubah bersandar. Melalui kajian ini, ia akan memahami niat pembelian untuk memilih kenderaan elektrik.

Kata kunci: Niat untuk membeli, kenderaan elektrik, Generasi X, Malaysia.

ACKNOWLEDGEMENTS

I would like to express my deepest gratitude to my thesis supervisor, Dr Nooraini binti Ismail, for their invaluable guidance, unwavering support, and insightful feedback throughout the entire process of completing this thesis. Their expertise and encouragement have been instrumental in shaping this work.

I extend my heartfelt appreciation to Universiti Utara Malaysia for providing the necessary resources and conducive environment for conducting this study. The facilities and library services have been indispensable in gathering relevant literature and data for this thesis. Furthermore, I am deeply grateful to my family for their unconditional love, encouragement, and understanding during this demanding journey. Their unwavering support has been my source of strength throughout.

Last but not least, I would like to thank my friends and colleagues for their encouragement, insightful discussions, and moral support, which have helped me stay motivated and focused. This thesis would not have been possible without the contributions and support of all those mentioned above. Thank you.

TABLE OF CONTENT

CERTIFICATION OF MASTER'S PROJECT PAPER	i
PERMISSION TO USE	ii
ABSTRACT	iii
ABSTRAK	iv
ACKNOWLEDGEMENTS	v
TABLE OF CONTENT	vi
CHAPTER 1: INTRODUCTION	1
CHAPTER 2: LITERATURE REVIEW	9
CHAPTER 3: METHODOLOGY	19
CHAPTER 4: RESULTS & DISCUSSION	39
CHAPETR 5: CONCLUSION & RECOMMENDATION	61
REFERENCES	68
APPENDIX	74



CHAPTER 1: INTRODUCTION

1.1: Introduction

The purchase intent of electric vehicles (EVs) car has gained significant attention, particularly in Malaysia due to their potential to reduce greenhouse gas emissions (GHG) and dependence on fossil fuels. This research aims to investigate the acceptance of EVs among Generation X consumers in Malaysia. Generation X refers to individuals born between 1965 to 1980, who are currently in their 40s and 50s. This generation is chosen amongst other generations due to their awareness and purchasing power of EVs. Understanding their attitudes and preferences towards EVs crucial for policymakers and manufacturers to promote sustainable transportation options. This research will discuss the factors influencing Generation X's purchase intention of EVs.

1.2: Background of study

Transportation industry plays a substantial role in the generation of greenhouse gas emissions and the deterioration of air quality, thereby necessitating the development of sustainable and environmentally friendly modes of transportation. EVs have emerged as a promising alternative to conventional internal combustion engine (ICE) cars, presenting the potential to decrease emissions and address the environmental consequences associated with transportation. Considering Malaysia's efforts to tackle environmental issues and foster sustainable development, it becomes imperative to comprehend the level of purchase intention towards EVs, with a specific focus on the Generation X consumer cohort.

Generation X, which encompasses individuals born between 1965s to 1980s, holds significant demographic importance in Malaysia as it serves as an intermediary cohort between the baby boomer and millennial generations (44-59 years old) (Kagan, 2024). The present generation has witnessed notable advancements in technology and societal transformations, which have had an impact on their attitudes, preferences, and behaviours concerning a range of products and services, including automobiles.

EVs market in Malaysia is now of modest size, although it is experiencing significant growth. Based on data provided by the Malaysian Automotive Association (MAA), the number of EVs sold in 2021 witnessed a notable surge, reaching 2,717 units, which represents a substantial growth compared to the 1,642 units sold in the preceding year of 2020 (Chan, 2023). EVs market share in Malaysia remains comparatively modest, representing a mere 0.4% of the overall volume of vehicle sales. Nevertheless, considering the government's objective to achieve a fleet of 125,000 (EVs) by the year 2030, it is anticipated that the market for EVs will persistently expand in the forthcoming years (Bernama, 2023). This phenomenon prompts inquiries regarding the precise determinants that shape individuals' inclination or opposition toward EVs adoption. Obtaining a thorough comprehension of these aspects is necessary to develop specific plans of action and programs that are geared toward boosting the use of EVs and achieving environmentally responsible transportation goals on a national scale across the country (Nadia Adnan, 2017).

The purchase intention of EVs among Generation X consumers may be influenced by various factors. The potential initial investment required for EVs purchases is likely to make cost and affordability significant factors to consider. The decision-making process of individuals can also be influenced by range anxiety, which arises from apprehensions regarding driving range and the accessibility of charging infrastructure (Hamed Khazaei, 2021). The presence of environmental consciousness and the consideration of sustainability issues can serve as influential elements, while individuals' perceptions of EVs technology, their driving experiences, and the accessibility of government incentives can additionally contribute to the formation of their attitudes towards EVs (Yasir Lashram, 2024)

Although there is existing research on EVs purchase intention in Malaysia, it is imperative to focus on the Generation X consumer group due to their distinct characteristics and market position. Gaining insight into the perspectives, preferences, and obstacles of this demographic is essential for the formulation of customised marketing strategies, financial incentives, and infrastructure development plans that effectively resonate with them.

The primary objective of this study is to fill the existing research gap by examining the level of purchase intention of EVs among Generation X consumers in Malaysia. The research will employ an approach to collect quantitative data to obtain a comprehensive understanding of

the diverse factors that impact individuals' purchase intention or rejection of EVs in Malaysia. The results of this study will hold significance for policymakers, automotive manufacturers, marketers, and industry stakeholders who aim to promote higher EVs adoption among Generation X consumers and contribute to Malaysia's endeavours in implementing sustainable and eco-friendly transportation alternatives. In essence, this research will be a valuable contribution to the wider global movement towards more environmentally friendly transportation systems, thereby promoting a sustainable future not only for Malaysia but also for the other regions.

1.3: Problem Statement

The transition to EVs is a critical step that must be made to halt the pace of climate change and reduce the negative impact of the transportation industry on the surrounding environment. Considering Malaysia's efforts to adopt more environmentally friendly methods of transportation, it is vital to gain a better knowledge of the consumer acceptance of EVs to facilitate their wider adoption. The purpose of this study is to investigate the factors that influence Generation X customers' acceptance of electric automobiles in Malaysia. Thus, this study chose Generation X consumers as a significant consumer segment with preferences and behaviours.

As of September 2021, Malaysia has been confronted with a range of environmental issues, prompting the nation to actively pursue sustainable measures, such as the integration of EVs. The escalation of air pollution has emerged as a noteworthy concern in urban regions of Malaysia, specifically in cities characterized by substantial traffic congestion. In light of the declining air quality, governmental bodies and relevant stakeholders have undertaken efforts to explore environmentally cleaner alternatives, such as EVs, which possess the capacity to generate zero tailpipe emissions (MIDA, 2022). This proactive approach aims to mitigate the adverse effects of air pollution. Similar to numerous other nations, Malaysia is susceptible to the ramifications arising from climate change. The combustion of fossil fuels within the transportation industry emits (GHGs), thereby making a significant contribution to the phenomenon of global warming and subsequent climate change. The adoption of EVs, which are powered by electricity generated from renewable sources, has the potential to substantially

diminish the nation's carbon footprint and contribute to the fulfilment of international obligations regarding emission reduction (Weeberb J. Requia, 2017).

The implementation of import taxes and levies on fully constructed EVs has been one of the significant factors contributing to the high cost of EVs in Malaysia (Koty, 2022). Because of these tariffs, the price of imported EVs models might dramatically increase, which reduces their competitiveness in the local market. The fact that Malaysia does not have a solid local ecosystem for the manufacturing of EVs has also contributed to the country's high prices. Vehicles that are not produced domestically are susceptible to the costs associated with importation and are often sold at a higher price point as a result. In an electric car, one of the most expensive components is the battery. Even though improvements in battery technology have resulted in declining prices over time, the cost of batteries continues to be a significant component of the total cost of EVs. The installation of charging infrastructure across the country necessitates the expenditure of a significant amount of capital. Adding to the total cost of owning an EVs is the expense of installing charging stations and continuing to maintain them.

The lack of a sufficient and well-distributed infrastructure for charging EVs in Malaysia presents a significant barrier to the mainstream adoption of EVs as transportation options. Potential purchasers of EVs are put off from purchasing because there are not enough charging stations in urban areas, roads, commercial hubs, or residential neighbourhoods. This causes them to worry that they will not be able to easily recharge their vehicles when they need to. As a result of the limited availability of charging stations, the practicality and convenience of owning an EVs are compromised, and customers are more likely to choose conventional automobiles instead (Lim, 2023). Another significant obstacle is this psychological barrier further exacerbates the difficulty of moving to EVs, as consumers choose the perceived safety and convenience of internal combustion engine vehicles. This is because EVs are not as efficient as internal combustion engine vehicles.

Despite an increased awareness of environmental issues and the advantages of EVs, the percentage of consumers in Malaysia who belong to Generation X who have adopted EVs is still relatively low. This raises questions about the underlying hurdles and drivers that influence the decision-making process that they have with electric automobiles. It is essential to get an understanding of these aspects to hasten the transition towards more environmentally friendly modes of transportation and accomplish the nation's sustainability goals.

1.4: Research Questions

Based on the problem defined, the study is carried out to answer the following research questions:

1. What is the relationship between price value and purchase intention of EV in Malaysia?
2. What is the relationship between perceived risk and purchase intention of EV in Malaysia?
3. What is the relationship between environmental concerns and the purchase intention of EVs in Malaysia?
4. What is the relationship between the infrastructure barrier and purchase intention of EVs in Malaysia?

1.5: Research Objectives

Therefore, the general objective of the study is to investigate factors influencing Generation X consumers' acceptance of EV cars in Malaysia. The specific objectives are:

1. To investigate the relationship between price value and purchase intention of EVs in Malaysia.
2. To investigate the relationship between perceived risk and purchase intention of EVs in Malaysia.
3. To investigate the relationship between environmental concern and the purchase intention of EVs in Malaysia.
4. To investigate the relationship between infrastructure barrier and purchase intention of EVs in Malaysia.

1.6: Significance of Research

The research on the purchase intention of EVs among Generation X consumers in Malaysia holds significant importance for several reasons. As Generation X consumers represent a significant demographic in Malaysia, their intention to purchase EVs can play a pivotal role in the promotion of sustainable mobility (Shahla Asadi M. N., 2022). To help in reduce carbon emissions, improve air quality, and mitigate the negative environmental impacts that relate to conventional automobiles, encouraging more members of Generation X to make conversion to EVs can be an effective strategy.

The findings of this study have the potential to shed insight into the issues that consumers of Generation X have regarding range anxiety and the availability of charging infrastructure. This insight can help prioritize the construction and growth of EVs charging networks, which will alleviate range anxiety, enhance the practicality and ease of owning an EVs, and reduce the cost of operating an EVs. In addition, the research has the potential to help the development of tailored consumer education and awareness campaigns by identifying the specific obstacles and misconceptions that Generation X consumers may have regarded EVs. Myths and misconceptions regarding EVs can be debunked, and more people will be encouraged to explore EVs as a practical mode of transportation if more people are aware of the benefits and technological breakthroughs associated with EVs.

The findings of this study are in line with Malaysia's commitment to ecologically responsible practices and sustainable growth. In addition, the encouragement of Generation X consumers to purchase EVs could lead to a notable advancement in the United States' efforts to meet its climate and environmental goals, which include lowering greenhouse gas emissions and promoting cleaner energy alternatives. The findings can provide information to policymakers and government authorities concerning the cost-related hurdles that are experienced by consumers of Generation X. This knowledge can assist in the development of efficient regulations, incentives, and subsidies to promote the adoption of EVs, as well as to make EVs more inexpensive and appealing to the target audience. The findings of this study have the potential to offer insight into the efficacy of existing financial support mechanisms, such as tax incentives, subsidies, and rebates, in persuading consumers of Generation X to embrace EVs. This assessment has the potential to assist in the modification of existing policies and the exploration of new avenues of financial assistance to make EVs more affordable (Zimm, 2021)

The significance of this study comes from the fact that it can bring about good changes in the way transport is managed in Malaysia. The research has the potential to accelerate the adoption of EVs, contributing to a greener, more sustainable, and energy-efficient future. This will be accomplished by addressing the specific acceptance-related variables that are prevalent among consumers of Generation X.

1.7: Scope of Study

The research will centre on consumers belonging to Generation X, referring to individuals born between 1965s and 1980s, who are currently residing in different regions of Malaysia, including both urban and rural areas. The study will examine various geographical areas to obtain a comprehensive portrayal of the viewpoints of Generation X consumers throughout the nation. The primary objective of the study is to obtain a sufficiently large sample size of Generation X consumers to ensure that the results are statistically significant and representative of the population. The selection of the sample will employ a Krejci Morgan sampling methodology. This approach aims to guarantee the representation of a diverse and inclusive study population. The research will utilize a quantitative research technique to obtain a comprehensive comprehension of the reception of EVs among Generation X consumers. Quantitative surveys can be utilized to gather numerical data, which can then be analysed to assess the EVs purchase intention and to identify the factors that influence the willingness to purchase EVs. Data will be gathered via survey questions and will be carefully constructed to effectively gather pertinent data regarding the acceptance of EVs among Generation X consumers, as well as the various factors that impact their decision-making process. The quantitative data obtained from surveys will undergo statistical analysis to quantify levels of acceptance and explore potential correlations among various factors.

1.8: Limitation of research

The study's findings may have limited generalizability, as they are specific to the Gen-X population in Malaysia and may not be relevant to other age groups or cultural settings. Extrapolating the findings outside the specified population can result in inaccuracy. The study's

findings could be affected by the sampling methodology employed, and if the sample does not accurately represent the total Gen-X population in Malaysia, it may introduce bias. For instance, if the sample consists mostly of individuals from metropolitan areas or with higher levels of education, the results may not provide an accurate representation of the wider Gen-X community. Relying on self-reported data, such as survey replies, can lead to social desirability bias or mistakes caused by participants' subjective interpretations. Individuals may not consistently offer precise details regarding their true intentions or actions. The study may lack a comprehensive examination of the impact of cultural influences on buying intentions. The study may not effectively represent the nuanced sentiments of Gen-X persons from diverse cultural backgrounds in Malaysia towards electric automobiles.



CHAPTER 2: LITERATURE REVIEW

2.1: Introduction

The growing worldwide apprehension regarding environmental sustainability and the imperative to tackle climate change have generated substantial enthusiasm for EVs as a more environmentally friendly and sustainable substitute for traditional internal combustion engine vehicles. The growing concern over the effects of climate change and the deterioration of the natural environment has sparked an increased interest in the development of environmentally friendly modes of transportation. Electric cars, also known as EVs, have recently emerged as a viable alternative to traditional automobiles powered by internal combustion engines. These vehicles have the potential to lower emissions of greenhouse gases and to lessen the negative impact that the transportation industry has on the environment. Malaysia, similar to numerous other nations, is actively adopting sustainable transportation solutions. Consequently, comprehending the reception of EVs among various consumer segments, such as Generation X, has emerged as a pivotal research domain. The objective of this literature review is to present a comprehensive analysis of prior research pertaining to the acceptance of EVs among Generation X consumers in Malaysia.

2.2: Definition and Concept of Variables

Electric Vehicles

The automotive industry in Malaysia has been undergoing a transformation, with a growing emphasis on sustainable and eco-friendly mobility solutions. EVs have become a focal point, driven by global environmental concerns and the need for cleaner transportation alternatives. Hereby, we will explore the types of EVs and analyse the market trends shaping the EV landscape in Malaysia.

1. Battery Electric Vehicles (BEVs): Battery of the EVs is at the forefront of the change within the realm of electric mobility. Because these vehicles are powered purely by electric power that is stored in rechargeable batteries, they do not produce any pollutants from their tailpipes. It is necessary to have access to charging infrastructure to use BEVs, and developments in battery technology are increasing the range and

efficiency of these vehicles. Operate only on battery power and fully deplete the petrol in the motor. EVs have a specific mileage limit before they require recharging by connecting them to a power source, which helps alleviate a driver's concerns about running out of power. Since 2010, the rise in popularity of battery technology has led to an increase in the number of charging stations in both urban areas and highways. The number of EVs is also growing.

2. Plug-in Hybrid Electric Vehicles (PHEVs): Plug-in Hybrid EVs are vehicles that combine an internal combustion engine with an electric motor and a battery that can be recharged. PHEVs provide a dual power source, which enables drivers to travel for shorter distances using only electric power and for longer distances utilizing the internal combustion engine. Those customers who are concerned about range anxiety can benefit from this versatility.
3. Hybrid Electric Vehicles (HEVs): HEVs are vehicles that combine an internal combustion engine with an electric motor to create a hybrid powertrain. HEVs, in contrast to plug-in hybrid EVs (PHEVs), cannot be charged by plugging them in. Their batteries are instead charged by a process that involves regenerative braking and the power of the engine. Individuals who are not yet prepared to fully commit to electric driving can use hybrid EVs as a transitional option.
4. Natural gas vehicles (NGVs): The sector has also benefited from the expansion of natural gas as a power source, which has led to an increase in the production of natural gas-powered vehicles. Similar to gasoline-powered vehicles, compressed or liquefied natural gas is utilized, resulting in reduced emissions that are more environmentally friendly.
5. Fuel cell electric vehicles (FCEVs): FCEVs are hydrogen-powered cars that have been extensively researched and developed by car companies. These vehicles provide the advantage of emitting zero emissions and could achieve up to three times the efficiency of gas-powered cars. The vehicles are equipped with hydrogen-powered fuel cells. Fuel cells convert hydrogen and oxygen into electricity, which is then used to power electric engines. The main impediments to the wider adoption of fuel cell vehicles are the

expenses associated with cars and the restricted availability of hydrogen pumping stations.

6. Flexible fuel vehicles (FFVs): FFVs can run on a blend of petrol and ethanol. Primarily derived from Macaw, ethanol has had advantages due to government laws that necessitate alternative fuel sources. At present, Flex-Fuel cars own the most extensive fuel station network.

Market Trends:

Cost and Affordability

The cost of EV cars has been a major barrier to their widespread adoption. Generation X consumers, who are typically in their peak earning years, are more likely to consider the affordability of EV cars. A study by (Yew-Ngin Sang, 2015) found that Generation X consumers in Malaysia perceive EV cars as expensive due to high upfront costs and limited government incentives. Therefore, addressing the cost factor is crucial to increase their acceptance. The impediments to the adoption of EVs among Generation X consumers in Malaysia have been recognised to encompass cost and affordability. According to the study conducted by (Ibham Veza, 2022), the significant initial expense associated with EVs emerged as a prominent factor discouraging potential consumers within this demographic. Furthermore, considerations regarding the extended cost-effectiveness and prospective maintenance expenditures of EVs in comparison to traditional automobiles play a significant role in shaping individuals' decisions to adopt them. Han et al. (2020) proposes that the implementation of financial incentives, tax breaks, and subsidies could serve as viable strategies to mitigate cost-related obstacles and enhance the accessibility of EVs among Generation X individuals.

EVs have garnered growing interest as a viable mode of sustainable transportation aimed at mitigating greenhouse gas emissions and addressing the challenges posed by climate change. Nevertheless, the initial investment and the perceived cost-effectiveness of EVs continue to pose substantial obstacles to their widespread acceptance. Multiple studies have underscored the significant financial barrier posed by the initial cost of EVs, which serves as a prominent disincentive for prospective purchasers. According to a study conducted by (Silvana Secinaro, 2022), a significant portion of consumers held the perception that EVs were more costly

compared to conventional vehicles, which had a detrimental impact on their intentions to purchase. The primary factor contributing to consumers' hesitance in considering EVs as viable alternatives is frequently attributed to the substantial disparity in initial costs between EVs and vehicles powered by internal combustion engines. Although EVs may have a higher initial cost, scholarly investigations have indicated that considering the overall cost of ownership throughout the vehicle's lifespan can offer a more precise assessment of its affordability. The findings of (Petra Zsuzsa Lévy, 2017) (Nur Ayesha Qisteena Muzir, 2022) indicate that, despite initial financial investments, EVs can exhibit a total cost of ownership that is comparable to, or potentially lower than, that of traditional vehicles. This is particularly evident when considering the savings associated with fuel consumption and maintenance expenses. Emphasizing the enduring cost-effectiveness of EVs has the potential to foster favourable consumer perceptions regarding their affordability. Government incentives and financial support are pivotal factors in enhancing the cost-effectiveness of EVs. According to a study conducted by (Nisa, 2022), it was found that consumers' perceptions regarding the affordability of EVs were positively influenced when they were made aware of the various financial incentives that are available, such as tax credits and rebates. Financial incentives have been shown to effectively decrease the overall cost of EVs, thereby enhancing their financial feasibility for consumers. Government incentives and financial support are essential factors in enhancing the cost-effectiveness of EVs. According to a study conducted by (Nisa, 2022), it was found that consumers' perceptions regarding the affordability of EVs were positively influenced when they were made aware of the various financial incentives that were available, such as tax credits and rebates. Financial incentives have proven to be an effective strategy in reducing the overall cost of EVs, thereby enhancing their affordability for consumers.

Environmental Concerns

Generation X consumers are increasingly aware of the environmental impact of traditional gasoline-powered vehicles. They are concerned about air pollution and climate change, making them more inclined to consider EV cars as a greener alternative. According to a study by (Khazaei H, 2021) (Geny, 2021), environmental consciousness is a significant driver of EV adoption among Generation X consumers. Numerous studies have underscored the significance of environmental consciousness and sustainability considerations as primary drivers for Generation X consumers in Malaysia to contemplate the adoption of EVs. According to the study conducted by (Abbasi, 2021), there is a positive correlation between the degree of

environmental consciousness among Generation X individuals and their likelihood of adopting EVs. The recognition of environmental concern serves as a motivating factor for individuals to engage in pro-environmental behaviours. The adoption of EVs can be perceived as a viable strategy to diminish one's personal carbon footprints and actively contribute to the preservation of the environment. Numerous scholarly studies have been conducted to examine the influence of environmental attitudes on consumers' intentions to acquire EVs. According to a study conducted by (Zeinab Rezvani, 2015), there was a notable correlation between positive environmental attitudes and consumers' inclination to view EVs as a feasible choice. Consumers who hold the perception that EVs possess superior environmental attributes are more inclined to exhibit an intention to procure such vehicles. The influence of environmental labels and certifications on consumers' decisions to adopt EVs has been the subject of research. According to a study conducted by (Shahla Asadi M. N., 2020), the inclusion of environmental labelling has the potential to enhance consumers' perceptions of EVs and increase their attractiveness as environmentally friendly alternatives. The implementation of transparent and informative environmental labelling has the potential to enhance consumer recognition of EVs as environmentally sustainable options, thereby fostering greater acceptance and adoption of these vehicles.

According to the findings of several research, environmental concerns may have a more significant influence on certain behaviours than they do on others. It has been demonstrated that people's direct and indirect concerns about the environment influence their willingness to pay a higher price for environmentally friendly products. In addition, past study on cutting-edge automobile technology studied the ways in which environmental benefits might influence the choice of car that buyers make. Electric cars (EVs) are considered as a useful method to keep cities moving by lowering oil dependence and air pollution, which could be beneficial for both health and the environment (Moses, 2020). EVs are also associated with a lower carbon footprint. Since EVs do not produce any exhaust emissions, driving one can assist you in reducing the amount of carbon footprint you leave behind. Further reducing the negative impact that charging cars has on the environment can be accomplished by selecting renewable energy sources for the power that is used in your home. A significant portion of the transition to an energy system that is based on hydrogen will be comprised of fuel cell vehicles (FCVs) that are powered by hydrogen. Among all the different types of power sources for vehicles, fuel cells have the potential to be the most efficient and cause the least amount of pollution when they are combined with the appropriate energy source (Stambouli, 2002)

Infrastructure Barrier & Perceived Risk

Infrastructure readiness pertains to the level of convenience that consumers experience when recharging their EVs at public charging stations, commonly referred to as "technologically facilitating" conditions. Infrastructure accessibility is considered crucial for the successful deployment of EVs (Alghoul, 2018). Continual enhancements to road infrastructure were necessary to facilitate vehicle operations. Continuous enhancements to road infrastructure were necessary to facilitate vehicle operations. The accessibility of infrastructure is considered crucial for the successful deployment of EVs. According to (Funke, 2019), improving road infrastructure for vehicle operations is consistently necessary. Additionally, (Funke, 2019) suggests that charging infrastructure may be needed to attract groups of people who are not the usual early adopters of PEVs. The accessibility and location of the public charging infrastructure should be situated on land that is owned by the public.

Malaysia's dedication to improving its EVs infrastructure is clearly demonstrated by its well-thought-out plans and policies. The Malaysian Green Technology and Climate Change Corporation (MGTC) has stated that the government's goal of installing up to 10,000 public charging stations by 2025 is on track, with approximately 700 charging stations already in service (MGTC, 2023). This effort is a component of the Low Carbon Mobility Blueprint 2021-2030, which has the objective of diminishing the country's carbon emissions and fostering sustainable forms of transport (MGTC, 2023). The Malaysian government has implemented various incentives to expedite the adoption of EVs. These incentives encompass tax exemptions on import duty, excise duty, and road tax for EVs that are either locally produced or imported. Additionally, there is sales tax relief specifically for locally assembled EVs. In addition, the government is evaluating current procedures to optimise the approval process for EVs charging stations, resulting in a reduction in the time needed for installation approval. Although Malaysia has made progress in several areas, it still encounters many obstacles in terms of its preparedness for EVs infrastructure. An extensive analysis conducted by (Muzir NAQ, 2022) identifies several challenges that hinder the general acceptance of EVs in the country. These challenges include the high cost of EVs, limited travel demand, insufficient availability of charging stations, potential strain on the power system, and limitations in battery capacity.

Range anxiety, which refers to the apprehension of experiencing a depleted battery during a trip, has become a significant determinant affecting the level of acceptance of EVs among Generation X consumers in Malaysia. According to research conducted by (Balqis Al Braiki, 2020), the decisions made by individuals regarding the adoption of EVs are significantly influenced by their perception of the driving range and the availability of charging infrastructure. The availability of charging infrastructure and concerns about the limited range of EV cars are significant barriers to their acceptance. Generation X consumers in Malaysia may be hesitant to switch to EVs cars due to the lack of charging stations and fear of running out of battery during long journeys. To enhance the purchase of EVs among Generation X consumers, it is imperative to establish a comprehensive charging infrastructure network and effectively address concerns related to range anxiety. This can be achieved through the implementation of awareness campaigns and strategic planning for infrastructure development. A study by (Huan Ngo, 2020) emphasized the importance of expanding the charging network and improving battery technology to alleviate range anxiety among Generation X consumers.

2.3: Theoretical Framework

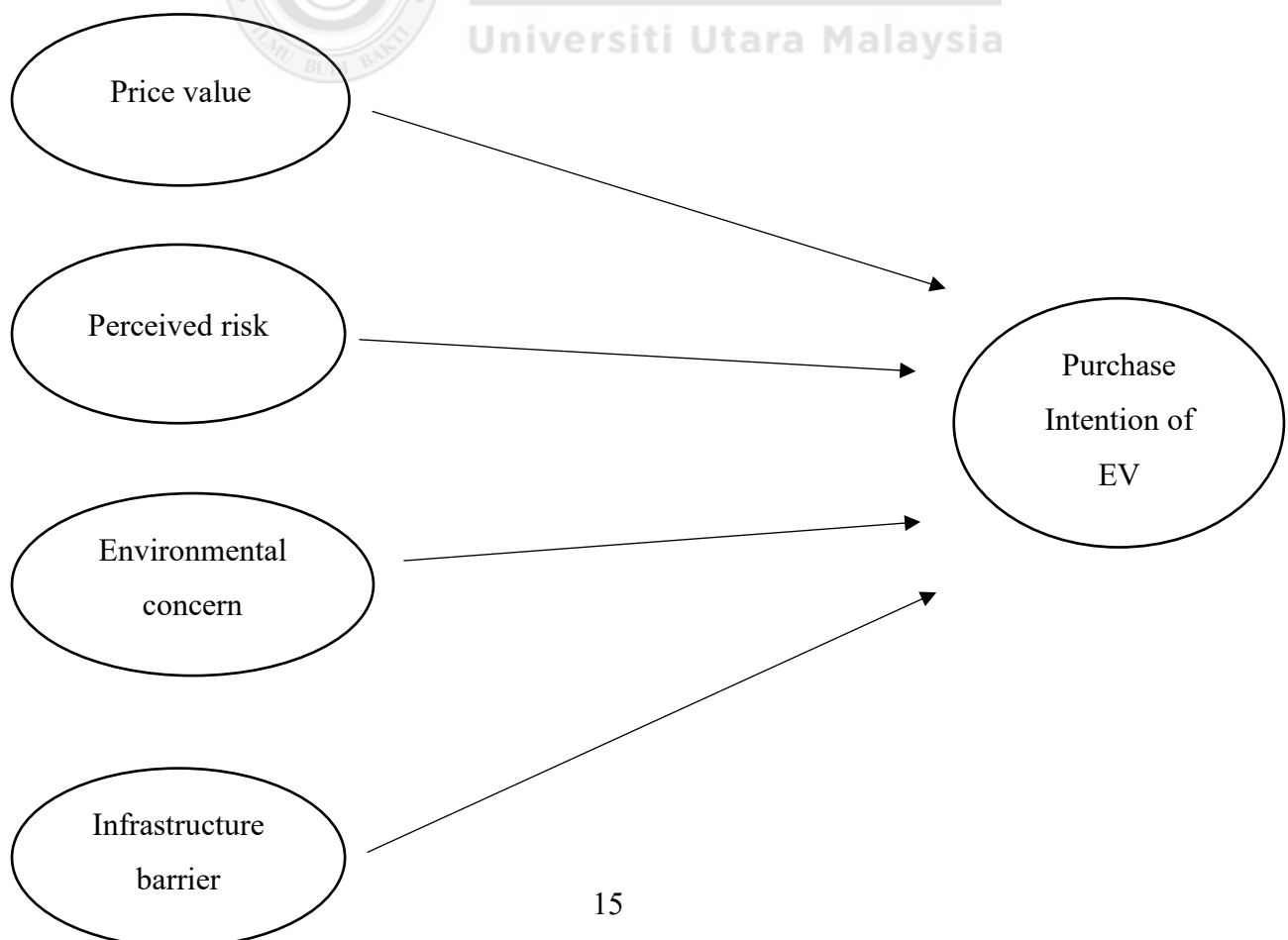


Figure: A conceptual framework of purchase intention of electric vehicle among Generation X. Adapted from (Ali Vafaei-Zadeh, 2022).

The theoretical framework for the study titled "Purchase Intention of EV among Generation X" will utilise various pertinent theories to comprehensively comprehend and elucidate the determinants that impact the acceptance of EVs among Generation X consumers. The Theory of Planned Behaviour (TPB) is selected as the theoretical framework. The Theory of Planned Behaviour (TPB) is a psychological framework formulated by Icek Ajzen during the latter part of the 1980s. The model discussed is extensively employed in comprehending and forecasting human behaviour, namely within the domains of decision-making and the development of intentions. According to the theory, individuals' conduct is believed to be impacted by their attitudes, subjective norms, and perceived behavioural control. The Theory of Planned Behaviour (TPB) proposes that the perceived usefulness and perceived ease of use play crucial roles in determining the acceptance of technology. The purchase intention Generation X consumers towards EVs can be influenced by their perception of the utility of EVs in fulfilling their transportation requirements, as well as the comparative ease of using EVs in relation to conventional vehicles.

The theory of planned behaviour (TPB) has garnered much attention and widespread usage in the realm of transportation research literature. It serves as an essential framework that aids experts in predicting various observable behaviours within this field, such as speeding intention - a phenomenon analysed by esteemed scholars like (Cristea, 2016) (Sang, 2015). TPB also finds its application for studying travel mode choices extensively discussed to date by trailblazing researchers including (Wang, 2021) (Vankov, 2021). Moreover, drink-driving conduct is another relevant topic closely examined utilizing TPB's valuable insights highlighted through studies conducted across different angles (Moan, 2013). Last but not least, seat-belt utilization status too recognized (Okamura, 2012). Despite the consensus that the Theory of Planned Behaviour (TPB) is a comprehensive framework for understanding human behaviour, Ajzen's seminal work in 1991 (Ajzen, 2002) highlighted its capacity to accommodate additional variables as long as they yield substantial insights into behavioural mechanics. Consequently, this investigation expanded upon the ambit of intention formation within an EVs paradigm by scrutinizing and explicating multiple aspects such as environmental concern levels, price range sensitivity indices, perception regarding economic advantages accrued through EVs usage, psychological benefits realization odds along with infrastructure

readiness considerations; thereby enabling more exhaustive comprehension and coverage of TPB nuances.

Despite its reputation as a comprehensive behavioural theory, it is worth noting that (Ajzen, 2002) has highlighted the TPB's capacity to incorporate supplementary variables provided they meaningfully enhance the model's ability to explain behaviour. Thusly, this research endeavours to expand upon the scope of intention surrounding EV paradigms through explicit scrutiny and analysis of various components including environmental concern, price range considerations, perceptions regarding economic benefits and psychological advantages offered by such vehicles; along with assessment pertaining infrastructure readiness - all intended for purposes of comprehensively encapsulating varying dimensions encompassed within said theoretical framework.

The primary objective of this research is to place emphasis on the diverse aspects that play a critical role on the purchase intention of EVs among generation-X. As presented in figure above, the conceptual framework deployed throughout this study centres around comprehending and analysing various factors accountable for impacting one's willingness or inclination towards selecting EVs over traditional automobiles. According to (Young, 2020), a conceptual structure serves as the rationale behind why particular research must be executed - elucidating its importance within academia and society at large. One significant aspect highlighted by such frameworks is assessing existing knowledge related to complex phenomena; typically done via conducting extensive literature reviews aimed at identifying missing links while examining underlying problems/substances germane therein; furthermore, outlining any methodological foundations used during project implementation hereby cementing desired outcomes objectively achievable by investigators' efforts.

(Imenda, 2014) elucidates that the chief aim of incorporating a conceptual framework in research is to provide researchers with enhanced clarity regarding fundamental variables and key concepts under consideration throughout their investigations. Furthermore, this systematic tool offers roundabout guidance related to methodological approaches inclusive of considerations such as study design, target population identification, sample selection procedure determination data collection technique acquisition alongside analysis techniques employed subsequently. In situations where there exist no pre-existing theoretical perspective which dominates field advancement pertaining to studied phenomena, an additional purpose

behind utilizing conceptual frameworks is quite pertinent; serving as effective navigational aids for studying intricate phenomenon bringing together different sets of diversified information collected through various mediums from diverse fields while ensuring seamlessly coherent progress resulting in further conclusive outcomes about researched matters at hand particularly crucial whilst encouraging future scholarly endeavours on similar topics wherein comprehensive literature reviews will be used.

The discussion will revolve around the correlation that exists between four distinct independent variables namely the price value, perceived risk, environmental concerns, and infrastructure barrier. These IVs are intrinsically linked with a crucial outcome variable or dependent variable (DV), which in this case pertains the purchase intention to choose an EV, will be discussed.



CHAPTER 3: METHODOLOGY

3.1: INTRODUCTION

This study will be based on a specific target of Generation X consumers in Malaysia. The reason we choose Generation X since they bear a large amount of demographic weight in Malaysia since it bridges the generational gap that exists between the baby boomer and the millennial generation. The current generation has lived through significant advances in technology as well as societal transformations, both of which have influenced their perspectives, preferences, and behaviours regarding a variety of products and services, including automobiles. These advancements have had an impact on the current generation.

Based on this, this study has chosen a quantitative approach so that objective theories can be tested by examining the relationship among the variables. The design of the variables and instrument will be measurable as it is quantitative so that the data can then be analysed using statistical procedures. To attain quantitative and measurable data results, a survey by the distribution of questionnaires through convenience sampling is deemed suitable and appropriate as it less costly with a high chance of acquiring accurate information and able to cover a large population.

3.2: RESEARCH DESIGN

As indicated by (Asenahabi, 2019), the reasoning of a researcher is believed to be reflected in their research design. The aim of such an approach is to prevent individuals from becoming frustrated or feeling like they are missing crucial information through the amalgamation and integration of all vital aspects required for conducting systematic studies. This process clearly demonstrates how each component operates as part of an integrated whole, effectively paving the way towards answering key research questions. In line with this notion, (Sousa, 2007) states that a properly designed investigation requires appropriate frameworks or guides which provide direction not only during planning but also throughout implementation and analysis phases. These frameworks must help answer specific hypotheses while catering for varying types of inquiries requiring different methodologies based on study designs available at one's disposal.

Therefore, it becomes imperative first to establish comprehensive preparation plans comprising solid awareness about varied options pertaining quantitative approaches - considered among ubiquitous classifications used across diverse fields today- before embarking upon any investigations in earnestness.

The process of empirical evaluation places significant importance on the utilization of numerical measurements and analyses. As a result, in order to conduct this type of analysis effectively, the researcher chose to employ a quantitative approach. According to (Sibanda, 2019), this method focuses primarily on collecting data that consists solely of numeric values which can then be extrapolated for use within larger populations or groups. Furthermore, it is worth noting that employing quantitative research also permits gathering information surrounding an entire group's general attitudes towards subjects as well as their beliefs and actions regarding them. For example, researchers may wish to obtain knowledge about how many individuals perceive EVs compared with traditional automobiles by implementing surveys. Finally, the success achieved by conducting these types of studies depends largely upon establishing clear starting points at each stage along the way so respondents have appropriately structured opportunities available whereby they can offer valuable input relevant directionally toward one's objectives throughout what follows thereafter.

As postulated by (Sukamolson, 2007), the utilization of quantitative research methodology offers a host of benefits, one such advantage is its ability to furnish results that may be expressed numerically through statistical analysis. Moreover, precision and definitiveness characterize this type of research investigation ensuring consistency in data gathering procedures thus enabling standardization; Hence making it an ideal approach for studies requiring replicability on account or clarity. In line with these documented advantages, from surveys conducted via conventional means as well as internet-based platforms alongside telephone interviews attest to widespread adoption ubiquitous nature among scholars today.

Theory

It is often noted that the foundation of quantitative research lies in theory. This approach is reflective of a long-standing tradition that follows a broadly deductive path towards the connection between theoretical frameworks and scientific inquiry. A specific example can be found through consideration of the theory known as planned behaviour (TPB). As an influential

social-psychological concept, TPB has been shown to hold significant potential for modifying individual intentions regarding their actions based on both internal and external factors or circumstances.

Hypothesis

As part of the scientific method, it is a customary procedure to engage in presenting an inclusive summary or synopsis regarding the primary methodologies involved in quantitative research. This would serve as concrete evidence that supports the notion or assumption formulated deductively from existing theories and subsequently put through rigorous testing with regards to its validity within established frameworks under scrutiny using empirical data

Nonetheless, it is worth noting that a considerable proportion of quantitative research endeavours do not necessarily demand the creation and testing of a hypothesis; alternatively, researchers may utilize a theory as an overarching framework to gather pertinent information about various social phenomena. While formulating testable hypotheses tends to feature predominantly in experimental studies, this practice also prevails in survey-based investigations built upon cross-sectional design principles.

Hypothesis 1: Price Value and Purchase Intention of EV

H0: There is no significant relationship between price value and purchase intention of EV cars.

H1: There is a significant relationship between price value and purchase intention of EV cars.

Hypothesis 2: Perceived Risk and Purchase Intention of EV

H0: There is no significant relationship between perceived risk and purchase intention of EV cars.

H2: There is a significant relationship between perceived risk and purchase intention of EV cars.

Hypothesis 3: Environmental Concern and Purchase Intention of EV

H0: There is no significant relationship between environmental concern and purchase intention of EV cars.

H3: There is a significant relationship between environmental concern and purchase intention of EV cars.

Hypothesis 4: Infrastructure Barrier and Purchase Intention of EV

H0: There is no significant relationship between infrastructure barrier and purchase intention of EV cars.

H4: There is a significant relationship between infrastructure barrier and purchase intention of EV cars.

Note: H0 refers to the null hypothesis, which posits that there is no statistically significant relationship or effect. On the other hand, H1 represents the alternative hypothesis, which suggests the presence of a statistically significant relationship or effect. The hypotheses will serve as a framework for conducting research to examine the correlations between the identified factors and the degree of acceptance among Generation X consumers towards electric vehicle (EV) cars in Malaysia.

Research Design

The researchers employed a quantitative approach to gather data from the participants in this study. The primary aim of quantitative approaches is to provide a mathematical representation and manipulation of data to describe and explain the processes they reflect. Various methodologies can be employed to gather data from a representative subset of consumers, including online surveys, questionnaires, and traditional paper-based surveys. This study exclusively includes individuals aged between 40 and 50 years who are residents of Malaysia, possess a valid driver's license, and get regular salary payments. Additionally, the survey primarily targeted respondents in Malaysia, which has a higher number of private automobile drivers, vehicles, and EVs charging stations designing research involves creating an initial plan that outlines the necessary steps to be followed by the researcher to successfully carry out the research.

Data Collection

In the realm of experimental research, a commonly employed approach involves engaging in pre-testing procedures with respondents prior to instituting modifications to an independent variable intended for use with only one group. Subsequent testing is then conducted subsequent to said modifications. This endeavour calls upon researchers either to conduct structured interviews directly or dispense carefully crafted and pre-coded questionnaires by way of surveys that pertain specifically within the domain of cross-sectional study techniques. The primary aim behind observational studies primarily centres around observing human beings engaged in their everyday lives while providing scrutiny for behavioural patterns displayed under specific scenarios; such observations are classified accordingly post-examination according to its unique set parameters. Respondents involved on this occasion shall be furnished information regarding accessing online Google Forms at specified URLs from which they may provide data whilst responding appropriately thereof as posed through corresponding queries presented forthwith thereafter.

Data Analysis

At this stage, the primary objective is to collect a substantial amount of data that would allow for thorough analysis. The purpose behind said analysis is to not only search for any patterns but also examine whether one variable holds significant influence over another. To achieve clarity and precision when presenting quantitative results, displaying them in visual formats such as graphs, pie charts or bar charts proves incredibly effective due to their innate ability to convey information in an immediate yet intuitive manner whilst providing insights among variables.

For a quantitative study to be taken seriously and deemed credible, it is imperative that an array of established statistical methods are employed. Such techniques must include the utilization of the chi-squared test for several reasons; most importantly, this analytical method can help in establishing valid causal connections between variables being studied within a given research project. Unfortunately, many sociology students often dread tackling this aspect since it tends to require considerable time and effort as well.

Findings and Conclusion.

At this stage of the research, it is incumbent upon the investigator to carefully scrutinize and thoroughly examine all data that has been collected throughout their investigative endeavours. A meticulous analysis must be conducted utilizing various methodologies in order to draw conclusions from said findings. The fruits of these labours will subsequently come into view for consideration by way of observations garnered through this methodical process. It bears mentioning that during such a review, one ought not exclude any hypothesis as faulty reasoning could render valuable discoveries elusive or even skew results inexplicably. Ascertaining whether there exists evidence supporting postulated theories should therefore encompass part-and-parcel with discerning significant links between theoretical concepts underpinning relevant aspects germane within subject matter explored hitherto.

As the concluding phase of the research, it becomes necessary to transcribe all gathered information into a written form. Depending on its intended readership audience - namely whether academic or client-based - this write-up must demonstrate an unquestionably comprehensive and thorough approach towards achieving definitive results that are authentic, reliable in nature as well as being indicative enough for facilitating further studies concerning said topic. Moreover, by successfully conveying the importance of such findings through meticulous documentation within existing literature also provides valuable contributions when published since knowledge pertaining to their subject is significantly enhanced correspondingly leading to potential future developments based upon these discoveries.

3.3: DATA COLLECTION METHOD

(Nayak, 2019) have established in their research that online administration and management of self-administered questionnaires is a practicable option. This methodology entails gathering information systematically while seeking to attain the desired data on dependent variables. When it comes to obtaining information, there are two primary forms: primary and secondary. For this study, preliminary data will be gathered through an electronic survey or questionnaire presented via various communication channels such as WhatsApp, Instagram, Facebook Messenger or E-mail. We plan to distribute our research questionnaire utilizing Google's free Forms service which provides us with the opportunity to temporarily reduce potential costs meanwhile enhancing productivity levels of conducting surveys electronically whilst

simultaneously increasing informational trustworthiness due its well-established reputation for providing secure platforms for hosting sensitive information.

The distribution of the questionnaires in Malaysia is targeted towards the individuals belonging to Generation X. These citizens are permitted and encouraged to fill out the survey utilizing a provided, standardized questionnaire that they must select independently. Additionally, data will be collected from various social media platforms as well for further analysis and comparison with those obtained through traditional methods.

Primary Data

(Boeije, 2005) has pointed out that there exists a diverse range of techniques social scientists resort to in gathering data during their research. Among these methods, experiments and quasi-experiments are widely recognized as significant due to their study methodology which supports firm causal assessments; this aspect renders them highly advantageous for scientific researchers seeking comprehensive analysis through rigorous studies. In addition, structured questionnaire surveys serve as an indispensable way of collecting extensive information on multiple variables from sizeable representative samples of respondents, thus playing a pivotal role in the process of acquiring accurate data. Thirdly yet crucially, the qualitative research approach is characterized by the pursuit to obtain detailed insights into specific phenomena through intensive collection strategies such as conducting prolonged interviews with small purposive groups or undertaking participant-based observation and focus group discussions aimed at capturing rich aspects relevant to understanding the central issue under investigation.

According to the findings of (Boeije, 2005), primary data refers to those pieces of information that are directly gathered for the singular purpose of solving a particular research problem, through methods and procedures which have been specifically tailored towards meeting this objective. Upon obtaining new sets of such collected data, they are subsequently incorporated into an already existing wealth or stockpile of social knowledge. As time elapses faster than we acknowledge it; other researchers in their quest for novel discoveries now provide access by availing secondary datasets to the majority research community. These are then deemed as part-and-parcel of the conglomerate termed "secondary data". When studying the behaviour of endangered or rare species in their natural habitats. Under these circumstances, surveys may be a more feasible way to gather information. In essence, conducting a survey involves

gathering data about various aspects of individuals' experiences and attitudes through questionnaires or interviews with members of a diverse cross-section of the population. Researchers typically use standardized questions that are designed to elicit specific responses from participants which can then be grouped into categories for further analysis. Furthermore, it is important that researchers approach this method with open minds as respondents provide insights based on their subjective perspectives rather than objective facts alone. Additionally, by employing surveys researchers can obtain valuable information regarding people's behaviours over time in an affordable manner compared observation techniques, though some subject such as those involving endangered species may not lend themselves easily to direct study by physical observation due logistical constraints. When endeavouring to undertake a sociological inquiry, it is the norm to direct one's focus towards households. Nevertheless, an alternative approach involves narrowing down the demographic and conducting examinations on smaller sub-groups based upon their prior conduct or patterns of behaviour therein exhibited to attain more accurate results.

During the course of this particular research undertaking, it was determined by the researcher that data acquisition would be most effectively carried out through a personally administered questionnaire. The primary reason for favouring such an approach pertains to its relative cost-effectiveness in comparison with other possible methods and reduced probability of inadvertent errors occurring during the gathering process; indeed, this technique has generally shown itself to constitute a highly efficient manner by which potentially large-scale population input can be readily obtained.

A total of four hundred questionnaires will be disseminated among the specific population residing in Malaysia. In order to maximize response rates and efficacy, Google forms shall be distributed via various online platforms including but not limited to WhatsApp's and Telegrams. These electronic forms are conveniently provided as URLs on respondents' devices that can easily record information pertaining to their responses which is later compiled through monitored google form websites by rigorous researchers overseeing the process. Accompanying this methodical survey, a cover letter has also been intricately composed for statistical accuracy and clarity purposes; it outlines both intended purpose behind conducting said research as well as objectives aimed towards achieving insight into communal dynamics within Malaysia's demographic diversities at large. Moreover, an utmost standard of confidentiality measures has been promised therein with regards protecting sensitive data

divulged willingly by participants answering questionnaire prompts outlined clearly throughout this discreet operation governed underwritten "word-of-honour".

3.4: STUDY POPULATION

There are diverse ways to acquire information. Ideally, a researcher would gather data from each member belonging to the population under scrutiny. Nevertheless, this is not always feasible or practical based on various reasons such as lack of resources or time constraints among others. In relation to our study's methodology, specific individuals were carefully selected according to two criteria for participation. Firstly, it was necessary that these participants have not availed themselves of an EVs at any point thus far in their lives which has significant bearing on this research project being undertaken. Secondly and additionally noteworthy with regard to demographics factorials amongst Generation X: targeting those who fall within the age bracket of 44-59 years old provides further insight into attitudes towards EVs specifically held by members partaking in that generational range segmentation analysis could provide useful insights worthwhile exploring through interpretative lenses used during qualitative exploration phase underway cutting edge technology presently employed heavily throughout academic field work fostering new vistas discovery amidst burgeoning plethora emerging technologies impacting society influencing global market trends shaping future developments yet unfolding before us all today.

The principal rationale for opting to choose consumers belonging to the Generation X cohort is rooted in the fact that their inclusion aligns with and suits the specific research area under examination, namely EVs. The suitability of these target demographics can also be ascribed to their possession of a substantially greater level of income vis-à-vis other consumer groups. Additionally, owing largely due to logistical considerations associated with traveling via roads on a regular basis, this demographic segment's requirement for personal vehicular transportation makes them appropriate candidates. Furthermore, members within this age group evince an undivided focus on determining crucial factors such as performance indexation metrics together with overarching value derived from owning cars before making any final purchasing decisions. These key aspects further corroborate how instrumental individuals from Gen X are when it comes down towards driving sustainable growth across automobile sectors while simultaneously establishing trust among customer bases through providing top-quality products marked by minimal risk exposure levels against known marketplace hazards.

3.5: SAMPLE SIZE

As stated by (Taherdoost, 2021), when the aim of an empirical inquiry is to derive inference about a population from data obtained through sampling of that particular population, the size of said sample assumes paramount importance. One must acknowledge that procuring findings from a random selection without previously guaranteeing it meets defined minimal dimensions could lead to inaccurate interpretations due to potential distortions surrounding both error and bias caused entirely by shortcomings resulting solely insufficient statistical representation alone.

To ensure that the results obtained from a random sample are accurate and unbiased, it is imperative to select an adequate sample size. The determination of what constitutes as sufficient depends on numerous factors, which necessitate clarification for inexperienced survey conductors. This is primarily because the total number of individuals chosen in proportion with population complexity, researcher objectives and anticipated statistical manipulations determines relevance rather than merely representing a percentage of those being studied. For example, hypothetically speaking; if researchers aim to forecast how people belonging to a particular age demographic would react when exposed to a new product, the research can initiate by gathering representatives who match this criterion accordingly. This competently illustrates why sampling adequacy hinges upon identifying participants within specified demographics rather than simply considering fraction or ratio expressed relative to the study's overall population.

For the purpose of this investigation, the researcher utilised the table that Krejcie and Morgan (1970) had created in order to determine the appropriate size of the sample (Chuan, 2006). Researchers have the ability to employ in order to determine the suitable sample size based on the size of the population, with the assumption that the population percentage is 0.5 and the degree of accuracy is 0.0512. Using this table, the process of determining the sample size is simplified, which eliminates the need for difficult calculations. As a result, this table has become an indispensable instrument in the field of social and behavioural science research. The chart that Krejcie and Morgan have created implies that a sample size of 384 is sufficient to establish statistically accurate inferences about a population that is at least one million people

in size. The significance of this guideline has been extensively acknowledged, and it has been utilised in a variety of research investigations to guarantee correctness and representativeness.

<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	100000	384

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970

Figure: Krejcie & Morgan 1970

In order to conduct their study in Malaysia, the researchers have made the decision to administer a questionnaire amongst members of the general population. To ensure that they obtain a representative sample for their research, these individuals will be selected randomly from within this group. In making this determination regarding selection methodology, convenience sampling has been deemed most appropriate by those involved with designing and implementing said survey. For clarity's sake: Convenience sampling refers specifically to

instances where data is acquired through voluntary participation on behalf of those providing information; such respondents are typically chosen at random based upon willingness or availability as described by (Sekaran, 2016)

3.6: SAMPLING TECHNIQUE

Sampling method

It has been established that there exist two distinct methodologies for sampling, which include probability and non-probability techniques (McCombe, 2022). In this particular inquiry project, the research team utilized a stratagem of data collection known as non-probability sampling. This means that participants or subjects were selected without granting each member of the population an equal opportunity to be chosen. Therefore, no random selection process took place during participant recruitment in this study design.

According to the scholarly works of (Aalizadeh, 2022), non-probability sampling constitutes a wide range of techniques that enables researchers to effortlessly select samples from a given target population without any specific probability distribution. (McCombe, 2022) emphasized on four common and widely acknowledged categories of non- probability sampling methodologies, namely: convenience, quota, snowball and judgmental methods respectively. In line with Simkus's research studies in 2022 pertaining to the limitations stemming from time constraints as well as controlled budgetary factors allied with operating within larger sampled sizes for various expeditions; it has been concluded via utmost consideration that implementing Convenience Sampling is favourable amongst all other available options due its practicality over aforementioned circumstances.

According to (Sekaran, 2016) scholarly work, the practice of convenience sampling is widely seen as an advantageous technique for rapidly acquiring fundamental information with optimal efficiency. This method facilitates expedited identification of potential research participants that match the pre-determined criteria established by investigators. In essence, this form of non-probability sampling relies on individuals who happen to be present at a specific location during a fortuitous moment in time when data collection occurs being chosen as study subjects or respondents. In the context of research, non-probability sampling is frequently employed in cases where utilizing a random probability-based sample from the population would be impractical or unfeasible due to resource constraints such as time and cost. In non-probability

sampling methods, there exists an uneven likelihood for any given unit within your target population to be selected. As such, it has been elected to utilize non-probability based techniques when surveying our group of 400 respondents.

3.7: RESEARCH INSTRUMENT DEVELOPMENT

A research instrument is a crucial and significant tool utilized in academic investigations to obtain, quantify, evaluate, and examine diverse data associated with it. In this study under observation, the collection of data through quantitative methods will be done by utilizing instruments that are more practical for efficient management. One such survey instrument employed here was administered using questionnaires. According to (Rowley, 2014) on identifying various types of research tools used widely across an extensive range of locations concerning numerous respondents involved at once - suggests that questionnaire indeed results as being one among them due to its facilitation service offered for uncomplicated information requests along with consistent far-reaching specialized knowledge exploration approaches processable via collecting explicit answers based upon standard questions asked within similar demographics profiles facilitating fair outright assessment opportunities. In order designated proponents enthused were engaged therein developing systematic strategized plans accommodating objectives included fetching sample responses involving potential participants who could eventually act up like suitable honest correspondents so executing surveys worked out convenient tactics having prepared accordingly devising proper framework made streamlining all measures effective logically characteristic attempts reached bringing outcomes put forth successful achievement apropos certain standards established thereof thereby making sure credibility maintained while ensuring authenticity upheld throughout.

This study employed a standardised questionnaire. Questionnaires are an effective technique for a big number of people and/or those who do not have the time to attend interviews or participate in studies to acquire data. For this analysis, a five-page questionnaire survey is suitable. Respondents could privately state their views or feelings without worrying about the researcher's potential reaction (NC, 2006). This study used a standardised questionnaire that has five sections. (Section A, B, C, D and E) will be used for the survey. Section A will consist of questions on respondents' demographic profiles. Section B, C, D, and E will be questions based on price value, perceived risk, environmental concerns, and infrastructure barrier

respectively. Sections B, C, D, and E will be a five-point Likert scale, ranging from (1) strongly disagree to (5) strongly agree.

Question
Section A (Fontanella, 2022) Demographic attributes of the respondents Section B Price Value (PV) (Zhang et al. 2020) Section C Perceived Risk (PR) (Choi et al.2015) Section D Environmental Concerns (EC) (Mohd Suki,2019) Section E Infrastructure Barrier (IB) (She et al. 2017) Section F Intention to Buy (INT) (Semeijn et al. 2019)

Figure: Source of Question

3.8: MEASUREMENT OF THE VARIABLES

The process of characterizing the values assumed by a variable is facilitated via measurement scales, as expounded upon by (Simo-Tagne, 2022). According to this author, it was in 1946 that renowned psychologist Stanley Smith Stevens proposed four tiers of assessment measures. These include the nominal scale, ordinal scale, interval scale and ratio scale - all comprising exemplary systems for gauging measurements. Of particular significance are each level's distinguishing features which may offer insights into probabilities surrounding analytical outcomes

(Yusoff, 2014) posits that there exists a need for utilizing diverse measures when it comes to assessing different items. As such, questionnaires were adopted as an investigative tool in this particular study; these surveys encompassed three distinct types of measuring scales-nominal scale, ordinal scale and interval or Likert Scale. To determine the ideal statistical inference test

applicable for analysis purpose, (Bhandari, 2022) methodology advocates collecting data from all measurement variables prior to undertaking comprehensive analytical investigation procedures thereof.

Nominal Scale

According to (Mou, 2022) a nominal scale is an appropriate method of measurement for qualitative variables, as it relies solely on the use of numbers to categorize or identify objects in this particular context. In contrast, (Bhandari, 2022) suggests that the nominal scale constitutes the most rudimentary and cost-effective form of assessment. Henceforth, when employing a nominal scale approach, responses are designated by name or classified into distinct groups. The Section A (Demographic Profile) of this questionnaire employed a nominal scale to measure gender, age, ethnicity, education, marital status, vehicle driving experience, monthly household income, and current locality.

Ordinal Scale

A type of measurement variable commonly referred to as an ordinal variable functions by allowing values to be entered in a predetermined order or rank. Such variables are frequently utilized within quantitative analyses and represent the second level of measurement, additionally constituting a subset of nominal variables. As per (Bhandari, 2022) research findings, items falling under this scale range from least satisfied to most satisfied on an escalating basis. Ordinal scales facilitate comparisons between two individuals with regards to their possession levels related to dependent variables—unlike nominal scales that lack such capacity. To measure both independent and dependent factors regarding respondents' intentions for purchasing EVs, concern for the price value, perceived risk, environmental concern, and infrastructure barrier. Sections B-F included employing not only ordinal but also interval-based Likert scaling techniques alike among those used in measuring these metrics via survey questionnaires too. To be more specific, the purpose of the Likert scale, which consists of five levels: [strongly disagree (1), disagree (2), neutral (3), agree (4), and highly agree (5)], is to assess and ascertain the extent or level of concurrence or discordance between the various affirmations being presented.

3.9: DATA ANALYSIS

The methodology applied to examine the information acquired through the questionnaire is elaborated in detail within our data analysis design. Study is investigated using several descriptive statistics, including measures like mean values, medians and modes as well as frequencies and percentages for comprehensive exploration of patterns contained within transcript responses. Furthermore, three diverse statistical methods were utilized - namely descriptive research explorations coupled with reliability analyses alongside Pearson correlations – towards gaining insights into key elements that influence intentions around Malaysian EVs purchases. The objectives underpinning this study worked together seamlessly alongside scalable measurements centred on constructs designed to detect tendencies across sufficient sample sizes needed for achieving reliable outcomes capable of impacting future projects beyond itself. To facilitate all aspects associated with collating clean insightful data sets conveniently managing said datasets; SPSS Software provided us a user-friendly interface containing customizable dialogue boxes suited precisely according to preference researchers use when inputting numerical value tables need.

In the particular study, the respondents who were specifically selected for participation provided responses to the survey questionnaire. The collected data were afterwards analysed utilizing the IBM Statistical Package for the Social Sciences (SPSS) software. SPSS refers to a collection of software packages designed to facilitate the analysis and management of substantial volumes of data through the utilization of comprehensive statistical analysis techniques. The software possesses the capability to transform the outcome into a tabular format and a graphical representation, thereby presenting the analysed data in a concise and accessible manner. The basic characteristics of the respondents were examined using descriptive statistics, which involved calculating the mean, percentage, and standard deviation. The researchers utilized a Likert scale consisting of five points to assess the participants' responses, which ranged from strongly agree to strongly disagree. The assessment was conducted using the parameters outlined in Table 1. Correlation analysis is commonly employed as an inferential statistical method to ascertain the association between two variables.

Reliability Analysis

Cronbach's alpha is a commonly used statistical measure in social sciences research to evaluate the internal consistency and reliability of a set of survey or test items. This statistic, denoted as (α), offers insight into how well all the individual components within an assessment tool truly align with one another in terms of measuring a singular concept or construct (Tavakol, Making sense of Cronbach's alpha, 2011). By performing this type of analysis, Cronbach's alpha allows for more accurate assessments by providing researchers with an indication on whether there are any discrepancies between different elements designed to capture specific attributes such as attitudes, abilities and knowledge. By measuring latent constructs within these questionnaires or tests using multiple variables based around similar concepts that have been identified previously - it becomes easier to gauge their effectiveness overall through examining correlations without biasing against negative responses from participants themselves who might not be fully aware they were partaking in experimental measures beforehand; thus, yielding reliable results.

Reliability and consistency are determined when Cronbach's Alpha is greater than 0.70 (Cronbach, 2004). According to (Tavakol, Making sense of Cronbach's alpha, 2011), a low Alpha indicates a lack of questions, poor item relationships, and unique building styles. One statistical measure of inter-rater reliability is Cronbach's Alpha. When the Cronbach alpha is less than 1, the relationship becomes more significant., whereas values greater than 0.51 are also considered acceptable.

<i>Cronbach's Alpha Score</i>	<i>Level of Reliability</i>
0.0 – 0.20	Less Reliable
>0.20 – 0.40	Rather Reliable
>0.40 – 0.60	Quite Reliable
>0.60 – 0.80	Reliable
>0.80 – 1.00	Very Reliable

Form of evaluation made in a Likert scale of 1 through 4 with details of values as follows:

1. Very poor
2. Not good
3. Good
4. Very good

Figure: Cronbach's alpha level of reliability

Descriptive Analysis

In the field of research methodology, descriptive analysis pertains to the systematic procedure of producing a summary and expounding on vital attributes associated with a given dataset or phenomenon. This type of analytical activity serves as an essential starting point for any comprehensive appraisal, yielding straightforward evaluations pertaining to both the sample size and measures used in data collection. By means of performing such analysis schemes, researcher is capable of presenting quantitative insights that can be readily comprehended-frequently employing statistics-based graphics and tables as visualization aids.

Descriptive analysis is a method that focuses on providing an accurate and systematic account of factors pertaining to a particular population, situation or occurrence. Its main objective is to furnish responses regarding what, who, where, when and extent aspects while excluding queries related to why questions (Loeb, 2017). This modus operandi plays an exceedingly significant role in determining attributes such as frequencies prevailing amongst data categories or trends existing within observations; thereby making it fundamental for deciphering various distinguishable characteristics (Descriptive Research | Definition, 2023). The methodology of descriptive research entails various techniques encompassing surveys, observations, and case studies. Surveys are a data collection tool employed for attaining an extensive spectrum of information capable of being scrutinized with respect to frequencies, averages as well as patterns thereof. In the event that exactitude in relation to truthfulness is indispensable while

acquiring insights into human behaviour or phenomena under observation, relying on respondents might not be suitable; hence solid justification can be found by resorting towards direct observational methods instead. Furthermore, exploring the realm beyond mere fact-finding encompasses carrying out exhaustive investigation focusing upon identification associated with noteworthy social phenomenon which were hitherto undocumented thereby creating standalone product offering unique value proposition called "descriptive analysis".

Spearman's Rank Correlation

The objective of the examination is to evaluate the degree of association between two variables and their appropriateness for characterization through a monotonic function. Subsequently, using the test statistic t, a p-value may be ascertained. In case this computed p-value falls below an established level of significance (usually 5%), it indicates that there exist ample grounds to reject the null hypothesis; otherwise, retention thereof is justifiable. With negative correlation occurring in cases where we evaluate coefficients ranging from -1 up till less than 0 indicating non-conformance or discrepancy among variables while positive correlation occurs when evaluated at greater values than zero, but lesser numbers compared with one signifying compliance amid them both simultaneously. Evaluation yielding results equalling '0' implies no correlation can be discerned amidst these parameters'.

$$\rho = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}$$

Figure: Formula of Spearman's Rank Correlation

3.10: SUMMARY

Finally, the approach that served as the foundation for our research has been defined and presented in this chapter. The following topics are covered: methods for doing, identifying a study population, selecting a sampling strategy, finding an adequate sample size, developing appropriate measurement equipment, analysing acquired data, and making conclusions. In the

fourth chapter, we will delve even further and more deeply into our analysis and discussion of the findings, even further.



CHAPTER 4: RESULTS & DISCUSSION

4.1: INTRODUCTION

This chapter presents the outcomes obtained from the research and analysis conducted. It covers various areas, namely: response rate, data screening and cleaning process, demographic profile of participants, scale measurement techniques (including descriptive analysis), reliability testing measures such as a normality test and Pearson's correlation test along with hypothesis tests and multiple regression analyses. The study solicited responses from one hundred forty individuals whose feedback was integral to this project. Furthermore IBM/SPSS Statistics 26 computer program facilitated our exploratory data assessment procedures which can be accessed through here. Essentially, this part fulfils two objectives in providing an overall summary of both inferential findings as well as their discussive interpretations related to significant discoveries identified throughout the inquiry.

4.2: RESPONSE RATE

A set of questionnaires consists of 23 questions including gender, age, ethnicity, education, marital status, vehicle driving experience, monthly household income, and current locality, and 15 questions for 3 variables of price value, perceived risk, environmental concern, and infrastructure barrier.

The variables of price value, perceived risk, environmental concern, and infrastructure barrier were generated using manual scoring as follows:

- Calculate the average score of the items for each dimension.

Example: Job Satisfaction = mean (item1, item 2, item3)

4.3: DEMOGRAPHIC PROFILE

Gender

		Gender			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	133	33.3	33.3	33.3
	Male	263	65.8	65.8	99.0
	Prefer not to say	4	1.0	1.0	100.0
	Total	400	100.0	100.0	

Figure: Gender of respondents.

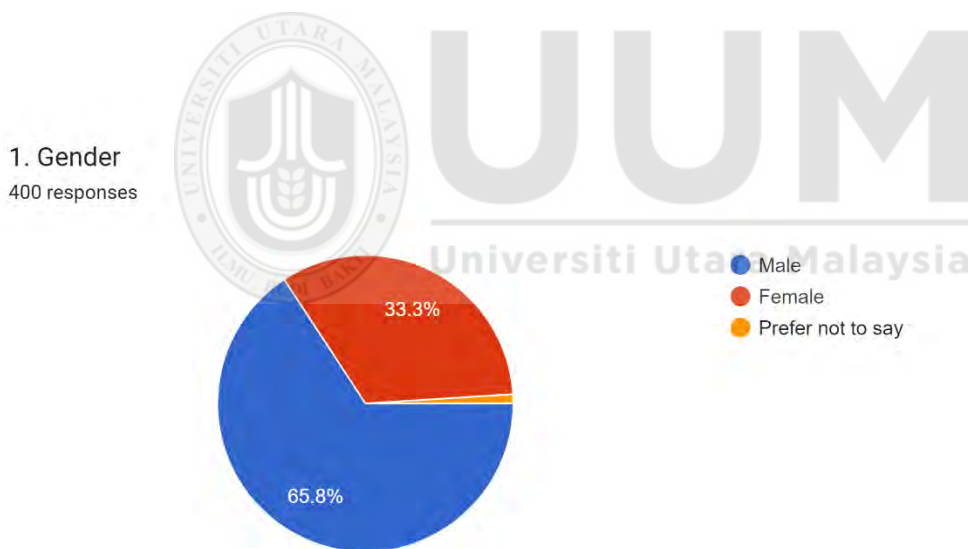


Figure: Pie chart of gender.

According to the data presented in both the table and pie chart regarding respondents' gender, it can be observed that a significantly larger proportion of males participated in this study survey as compared to their female counterparts. Specifically, out of all respondents who took part in this research initiative, an overwhelming 65.8% (equivalent to 263 individuals) identified themselves as male. It is noteworthy that only about one-third or roughly 33.3% (133 people) were women while those who chose not to disclose any information related to their

gender constituted just around 1% (or four people). Various reasons may explain why such marked differences exist between genders when it comes participation rates for surveys centred on Vs; perhaps men are more likely than females towards EVs awareness-raising campaigns through various convenient digital channels which increasingly dominate social interactions these days?

Age

		Age			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	41-46 years old	46	11.5	11.5	11.5
	47-50 years old	208	52.0	52.0	63.5
	51-56 years old	146	36.5	36.5	100.0
	Total	400	100.0	100.0	

Figure: Age

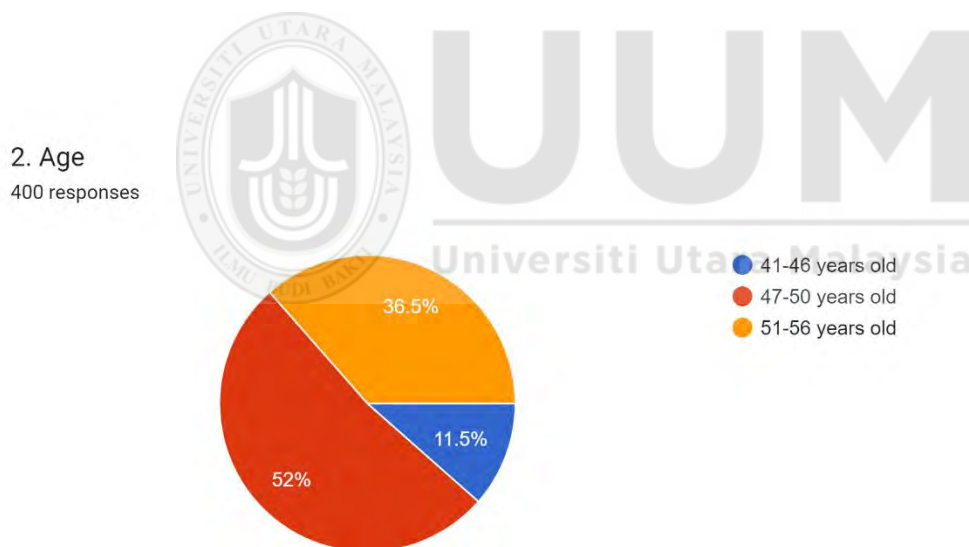


Figure 1: Pie chart of Age.

The data derived from the table and pie chart illustrate that among all age groups, individuals who belong to the 47-50 years old category were found to be the most numerous respondents with a percentage of 52%, amounting to a total of 208 people. The second-largest group in terms of participants was those ranging between ages 51-56 whose constitutes reached an overall representation rate equalling at about 36.5% (146 persons). Lastly, it is evident according to said sources that individuals aged anywhere between categories categorized as

being within ages spanning from 41-46 obtained recognition by accounting for only around 11.5 % which translates into them also having fewer survey-takers of 46 persons represent their cohort compared relative abundances exhibited amongst other selections listed above.

Ethnicity

Ethnicity					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Chinese	198	49.5	49.5	49.5
	Indian	125	31.3	31.3	80.8
	Malay	77	19.3	19.3	100.0
	Total	400	100.0	100.0	

Figure: Ethnicity

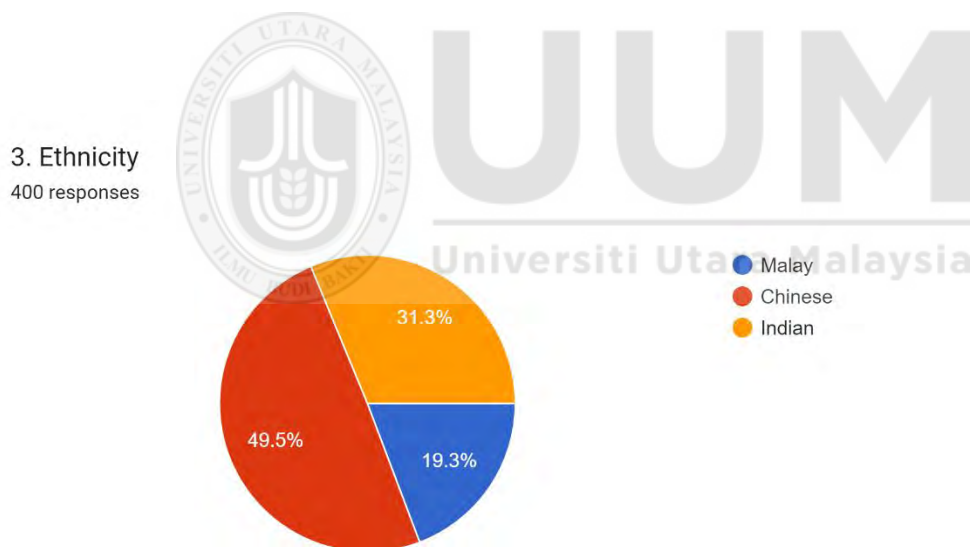


Figure: Pie chart of Ethnicity

As per the data presented by both the table and pie chart regarding ethnicity, it can be inferred that respondents belonging to the Chinese race constitute a majority with a respondent rate of 49.6%, comprising as many as 198 participants. On further scrutiny, it becomes evident that individuals identifying themselves as Indian are also fairly represented in this study, with their fraction amounting to around 31.3% (125 respondents). In contrast, while still accounting for almost one-fifth of all participants who responded during this survey period - we find Malay

people constituting only about 19.3% (77 respondents) of all responding ethnicities considered within its scope.

Education

		Education			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelor's Degree	170	42.5	42.5	42.5
	High School	32	8.0	8.0	50.5
	Master's Degree	184	46.0	46.0	96.5
	Ph.D. or higher	14	3.5	3.5	100.0
	Total	400	100.0	100.0	

Figure: Education

4. Education 400 responses

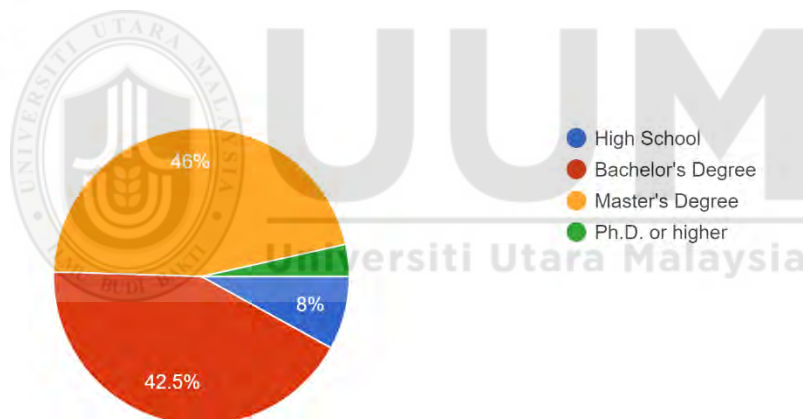


Figure: Pie chart of Education

According to the data presented in both the table and pie chart that refer to academic respondents, it can be inferred that individuals with a master's level of education constitute the largest proportion at 46% which corresponds to 184 participants. The second highest population belongs to those who hold a degree academic qualification standing close behind at 42.5%, indicating their presence as strong contributors comprising around 170 people. Next up is seen among persons holding high school academics qualifications make up an amounting percentage of only about 8% accounting for approximately 32 survey takers while those

achieving Doctorate-level certification represent merely 3.5% percent or 14 candidates forming one of our smallest samples from this group surveyed earlier on mention here thus far.

Marital Status

Marital status				
		Frequency	Percent	Valid Percent
Valid	Married	257	64.3	64.3
	Single	143	35.8	35.8
	Total	400	100.0	100.0

Figure: Marital Status

5. Marital status

400 responses

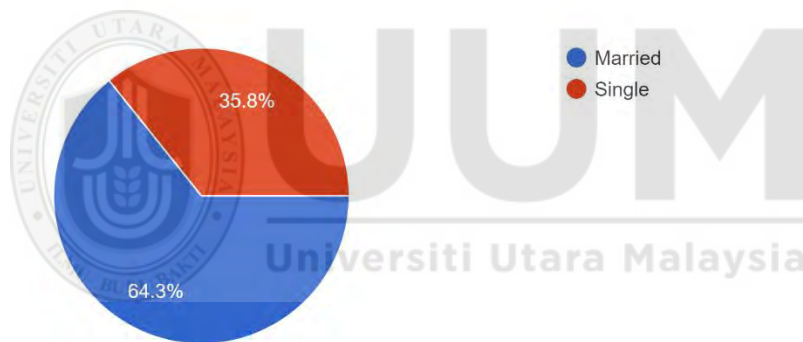


Figure: Pie chart of Marital Status.

Upon analysing both the table and pie chart that illustrate respondents' marital status, it can be inferred that a considerable majority of them are in fact married. This is evidenced by the maximum percentage value of 64.3% which equates to as many as 257 individuals having indicated their current legal union or previous nuptials. On the other hand, there seems to be a relatively lesser number of participants who consider themselves single with only about 35.8%, comprising approximately 143 individuals indicating this relationship category out of all those who took part in this survey study. As such, being unmarried appears to have been reported less frequently than any other listed marital identification among all these involved parties based on our findings provided through visual aids shown.

Vehicle Driving Experience

Vehicle Driving Experience				
		Frequency	Percent	Valid Percent
Valid	< 5 years	5	1.3	1.3
	> 16 years	227	56.8	56.8
	11-16 years	115	28.7	28.7
	5-10 years	53	13.3	13.3
	Total	400	100.0	100.0

Figure: Vehicle Driving Experience

6. Vehicle Driving Experience

400 responses

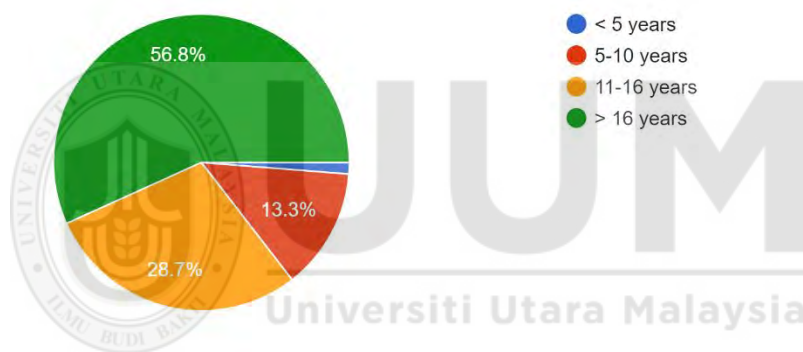


Figure: Pie chart of Vehicle Driving Experience

According to the tabulated data and accompanying pie chart regarding vehicle driving experience, it can be inferred that a majority of drivers belonging to this survey possess over 16 years of driving expertise. This population accounts for approximately 56.8% (227 respondents) on record, while individuals with an 11–16-year tenure represent roughly 28.7% (115 respondents). Furthermore, persons possessing 5-10 years' worth of driver's license gravitate towards only about 13.3 % (53 respondents), whereas those with less than 5 years exposure in driving experience constitute just under 1.3 % (5 respondents).

Monthly Household Income

Monthly Household Income				
		Frequency	Percent	Cumulative Percent
Valid	< 3,000	2	.5	.5
	>15,000	9	2.3	2.8
	12,001-15,000	52	13.0	15.8
	3,000-6,000	27	6.8	22.5
	6,001-9,000	156	39.0	61.5
	9,0001-12,000	154	38.5	100.0
	Total	400	100.0	100.0

Figure: Monthly Household Income

7. Monthly Household Income

400 responses

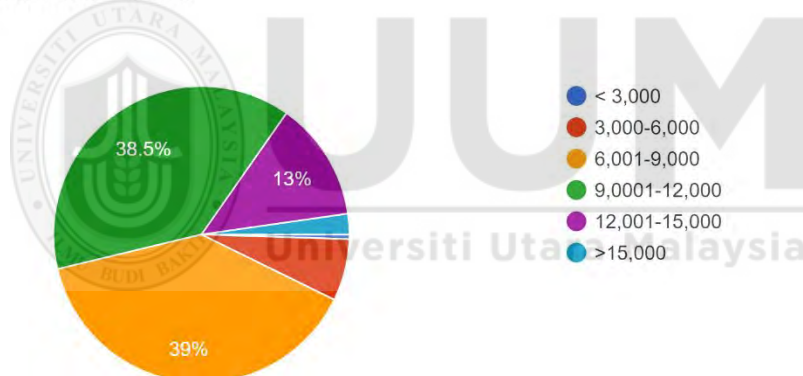


Figure: Pie chart of Monthly Household Income

The average monthly household income of survey respondents is displayed in table & pie chart as above. Six groups have been created based on how much money people make monthly basis. 39% of respondents (156 total) had monthly salaries of range RM6,000 - RM 9,000, while 38.5% (154 total) have monthly income of between RM9,000 to RM12,000. However, only 52 respondents are 13% as salary range records at RM12,000 – RM 15,000. Followed by the income of range RM 3,000 – RM 6,000 at 6.8% of respondents (27 total), those salary more than RM 15,000 they're 2.3% of respondents (9 total) and lastly the income at least is RM 3,000 marking at 0.5% of respondents (2 total).

Current Locality

Current Locality					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Rural	1	.3	.3	.3
	Sub-urban	69	17.3	17.3	17.5
	Urban	330	82.5	82.5	100.0
	Total	400	100.0	100.0	

Figure: Current Locality

8. Current Locality

400 responses

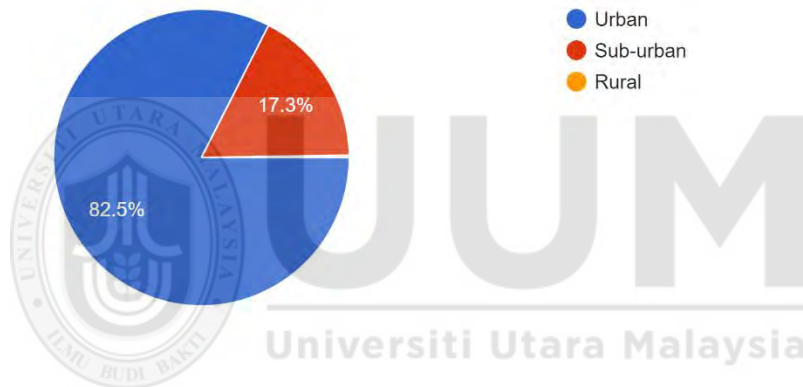


Figure: Pie chart of Current Locality

According to the data presented in both the table and pie chart pertaining to current locality, it is evident that respondents hailing from urban areas have registered a significantly higher rate of 82.5%, with 330 individuals having provided their inputs accordingly. This percentage is followed by those dwelling in sub-urban territories who accounted for a comparatively lower proportion at 17.3% or an equivalent number of 69 contributors. It can be further deduced from the analysis that responses derived from rural zones were minimal as only one respondent was recorded, representing around just about negligible figure constituting merely .03%.

4.4: SCALE MEASUREMENT

Descriptive Analysis

The process of descriptive analysis was executed on fifteen distinct items based upon their respective variables. Consequently, a comprehensive summary comprising the mean and standard deviation values for each item in question has been systematically presented within the table provided below.

Price Value	Variables	Mean	Std Deviation
PV 1	In my opinion electric car is reasonably priced.	3.75	0.992
PV 2	In my opinion electric car offer value for money.	3.72	1.015
PV 3	In my opinion electric car is economical in the long run.	3.72	0.992

Perceived Risk	Variables	Mean	Std Deviation
PR 1	In my opinion electric car would lead to a financial loss to me.	2.17	0.827
PR 2	In my opinion electric car might not perform well and create problems.	2.04	0.855
PR 3	In my opinion electric car would be risky.	2.19	0.896

Environmental Concern	Variables	Mean	Std Deviation
EC 1	Supporting environmental protection makes me feel that I'm an environmentally responsible person.	4.01	0.761
EC 2	I feel proud of being a green person.	4.17	0.839
EC 3	Supporting environmental protection makes me feel meaningful.	3.98	0.720

Infrastructure Barrier	Variables	Mean	Std Deviation
IB 1	In my opinion the public infrastructure for electric car is available.	2.15	0.841
IB 2	In my opinion the electric car infrastructure at work is available.	2.06	0.833
IB 3	In my opinion the electric car infrastructure at home is available.	2.03	0.872
IB 4	In my opinion the electric car infrastructure on highway is available.	2.14	0.845

Intention to Buy	Variables	Mean	Std Deviation
INT 1	When I have/need to buy a new car, I'm willing to buy an electric car.	4.09	0.734
INT 2	When I have/need to buy a new car, I'm planning to buy an electric car.	3.80	0.757
INT 3	When I have/need to buy a new car, I opt to buy an electric car?	3.90	0.806

Figure: Summary of mean and standard deviation.

As seen in the abovementioned tabular presentation, there are displayed both the averages and standard deviations of those parameters which proved to have a successful impact on participants' intentions regarding their potential acquisition of an EVs. Based on this summary data, it is noteworthy that all four independent variables were rather close to 4.0 as far as their numerical values go while not displaying any considerable amount of deviation from said value(s). Taking these results into account leads us towards concluding that there exists a strong inclination amongst respondents for purchasing an automobile powered by electricity; this conclusion being evidently supported through logical interpretation thereof based upon our gathered findings.

In addition, it was shown that the independent variable representing environmental concern had the highest mean, whereas the infrastructure barrier had the lowest mean over the course

of this research. In general, the respondents, who are Generation X in Malaysia, are aware that having concern for the environment was a significant motivating factor in their decision to purchase an EVs. The reason for this is EC2, which states, “I feel proud of being a green person” and has a mean score of 4.17. Most respondents agreed with this statement. Meantime, IB 3: “In my opinion the electric car infrastructure at home is available”, 2.03 marks the lowest mean, which was shared by all groups.

Besides, the statement “In my opinion electric car is reasonably priced” has the highest mean (3.75) for price value, PV1 as they are much EVs out there with attractive price offers mainly EVs from China, such as BYD, and Chery. Moreover, PV2 and PV3: “In my opinion electric value for money” and “In my opinion electric car is economical in the long run” respectively shares the same mean, 3.72 as it denotes the pricing point would an attraction to consumers in Malaysia and would be the next main mode of transportation. In addition, in terms of perceived risk, the statement “In my opinion electric car would be risky” records the highest mean, 2.19 as follows by PR 1 and PR 2: “In my opinion electric car would lead to financial loss to me”; “In my opinion electric car might not perform well and create problems” respectively. This indicates that the respondents look towards future perspective of mean of transportation which would be beneficial in the long run as the safety measures are ensured in EVs and value for money.

In terms of infrastructure barrier, IB 1: “In my opinion the public infrastructure for electric car is available” marks the highest mean (2.15) as compared to lowest mean of 2.03 of IB 3: “In my opinion the electric car infrastructure at home is available”. Respondents view as the readiness of EVs infrastructure is lacking in Malaysia as it is in budding stage and more installation to be fixed by the government to cater the citizens. In conclusion, price value, perceived risk, environmental concern, and infrastructure barrier influence the purchase intention among Generation X in Malaysia

4.5: REALIBILITY ANALYSIS

Cronbach's alpha served as the measure of choice for assessing the reliability of questionnaire variables. In addition to evaluating item stability and consistency, Cronbach's alpha was employed. As displayed in the table below, guidelines exist pertaining to desirable magnitudes of this coefficient (Tavakol, Making sense of Cronbach's alpha, 2011).

Alpha Coefficient Range, α	Strength of Associations
$\alpha \geq 0.90$	Excellent
$0.90 > \alpha \geq 0.80$	Very Good
$0.80 > \alpha \geq 0.70$	Good
$0.70 > \alpha \geq 0.60$	Moderate
$0.60 > \alpha$	Poor

Figure: Size of Cronbach's Alpha Coefficient.

Pilot Test

Conducting a pilot study before disseminating the questionnaire to its intended recipients is a necessary step in research. The preliminary testing of the survey allows for an examination of the relationship between independent and dependent variables, verifying that each question accurately supports their corresponding variable and ensuring dependable outcomes. A reliability coefficient value exceeding 0.70, as prescribed by (Saidi, 2019), confirms acceptance levels deemed adequate for successful experimentation execution. If obtained data reveals said values have not been achieved through analysis using Cronbach's alpha coefficient on 30 randomly selected sent respondents' answers during this early-stage assessment phase; adjustments may need implementation until satisfactory results are attained before wider dissipation across participants occurs.

		Cronbach's Alpha	N Items	Results
Independent Variable	Price Value	0.854	3	Very Good
	Perceived Risk	0.944	3	Excellent
	Environmental Concern	0.953	3	Excellent
	Infrastructure Barrier	0.942	4	Excellent
Dependent Variable	Intention to Buy	0.947	3	Excellent

Figure: Reliability Statistics for Pilot Test

The statistics pertaining to dependability for individual variables tested during the pilot phase are presented in the table above. Findings from reliability testing indicate that, excepting sort out, a significant proportion of variables yielded an "excellent" and "very good" outcome with Cronbach's Alpha values surpassing 0.90 and range 0.80 – 0.90. Based on these results, one may conclude that both dependent and independent variable factors demonstrate favourable association amongst each other resulting in questionnaire validity; thereby enabling research personnel to proceed towards distributing questionnaires within specified populations utilizing Cronbach's Alpha as reference. The results for the N items' price value are identified as "very good," with a mean of 0.854. The independent variables in question, namely perceived risk (0.944), environmental concern (0.953) and infrastructure barrier (0.942), fall under the category of "excellent." In other hand, our dependent variable intention to buy is categorized as excellent with a mean score of 0.947.

Actual Reliability Test

Upon procuring data from a sample of four hundred respondents, it became necessary to perform an additional reliability test in order to ascertain the consistency and dependability of all variables involved.

		Cronbach's Alpha	N Items	Results
Independent Variable	Price Value	0.8	3	Very Good
	Perceived Risk	0.745	3	Good
	Environmental Concern	0.645	3	Moderate
	Infrastructure Barrier	0.84	4	Very Good

Dependent Variable	Intention to Buy	0.756	3	Good
---------------------------	------------------	-------	---	------

Figure: Actual Reliability Statistics

The table above illustrates the concrete outcomes of reliability statistics obtained for all variables. Cronbach's alpha values are presented, indicating a satisfactory level of reliability at 0.756 for the dependent variable and 0.8 for the independent variable in question from our conducted test results on pertinent data sets. The results for the dependent variable of “price value” shows at 0.8 (very good), “perceived risk” marks at 0.745 (very good), “environmental concerns” marks at 0.645 (moderate), and “infrastructure barrier” falls at 0.84 (very good). Meanwhile for dependent variable, “intention to buy” indicates lows reliability of 0.503.

4.6: NORMALITY TEST

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Price_Value	.223	400	<.001	.865	400	<.001
Perceived_Risk	.282	400	<.001	.820	400	<.001
Environmental_Concern	.224	400	<.001	.864	400	<.001
Infrastructure_Barrier	.257	400	<.001	.787	400	<.001
Intention_to_Buy	.216	400	<.001	.921	400	<.001

a. Lilliefors Significance Correction

Figure: Normality Test for all variables

The above table presents the outcomes of normality tests, specifically Kolmogorov-Smirnov and Shapiro-Wilk tests for statistical parameters such as degree of freedom and p-value. Given that the sample size exceeds 50 observations, this study shall rely on interpreting results from Kolmogorov-Smirnov test rather than Shapiro-Wilk's, which is only appropriate for relatively smaller samples. It should be noted that null hypotheses must be rejected if corresponding p-values fall below a significance level of 0.05.

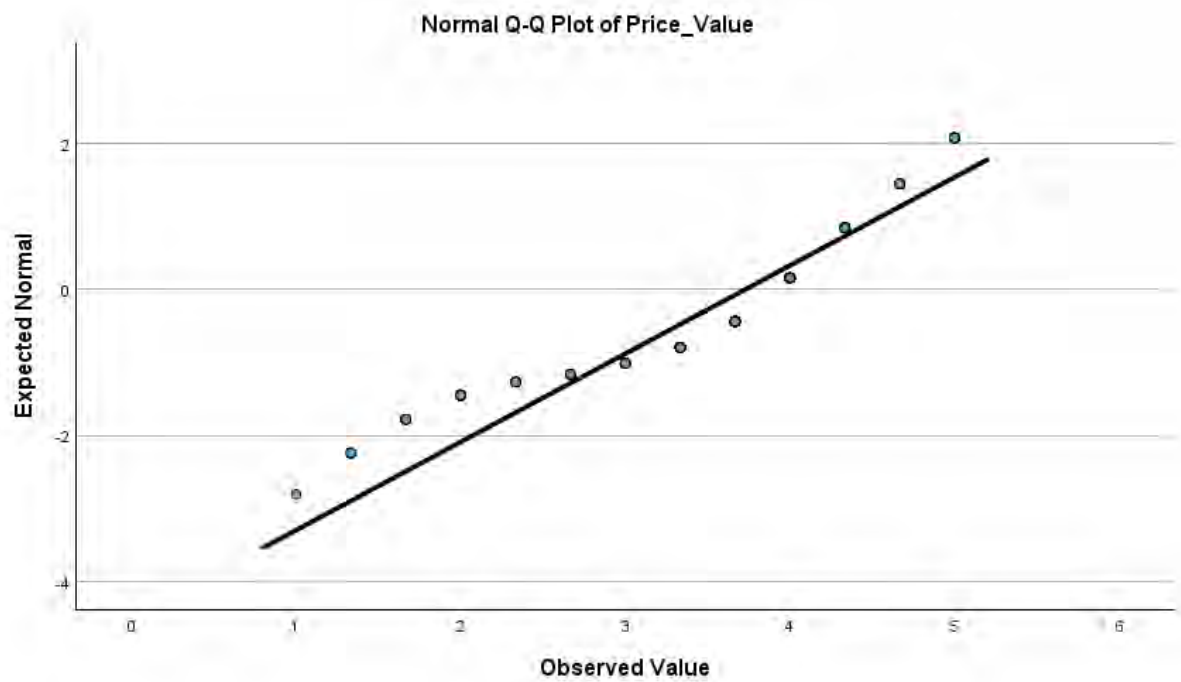


Figure: Normality Test of Price Value (IV 1)

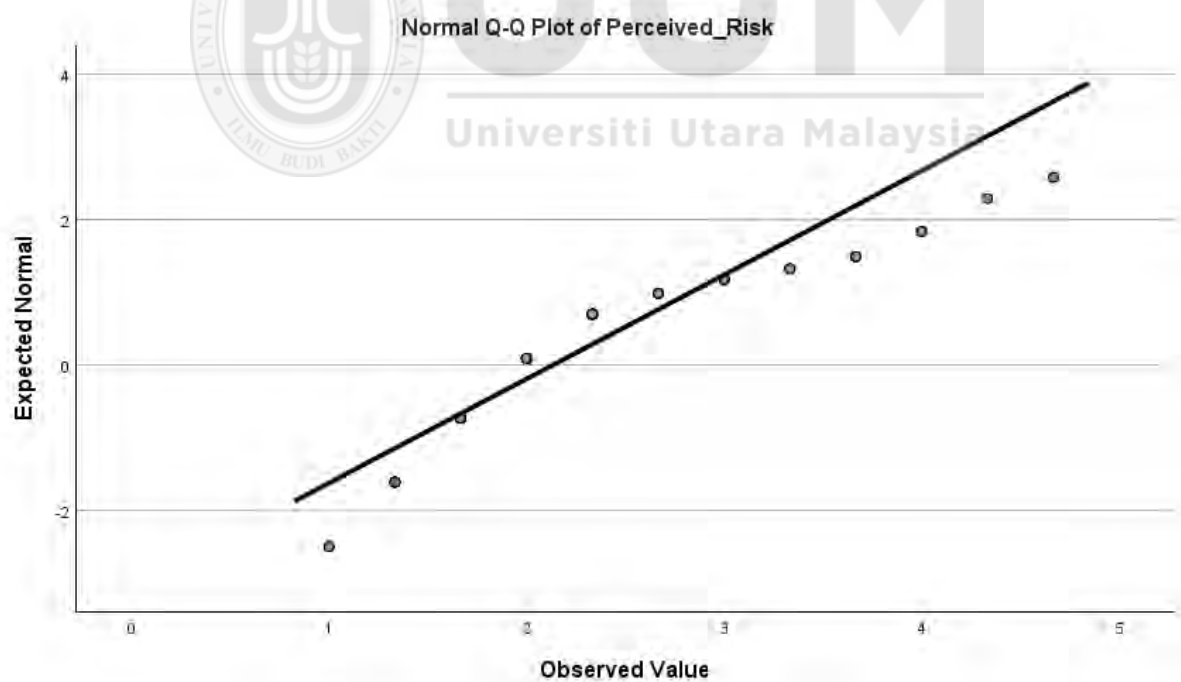


Figure: Normality Test of Perceived Risk (IV 2)

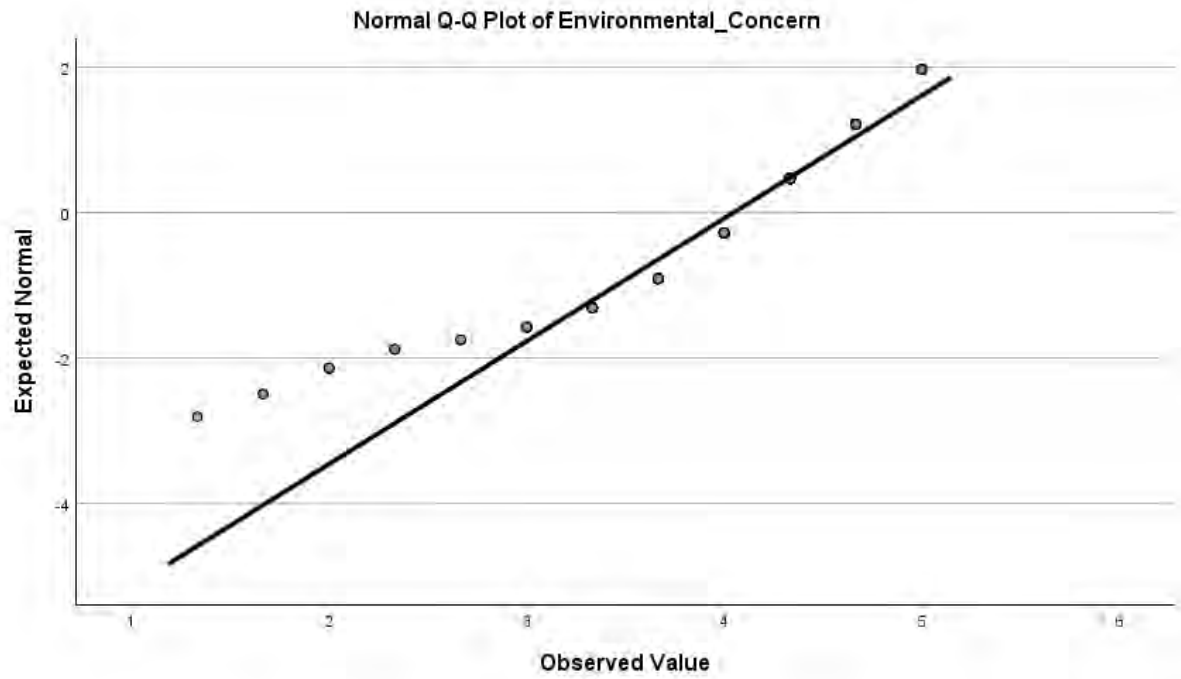


Figure: Normality Test of Environmental Concern (IV 3)

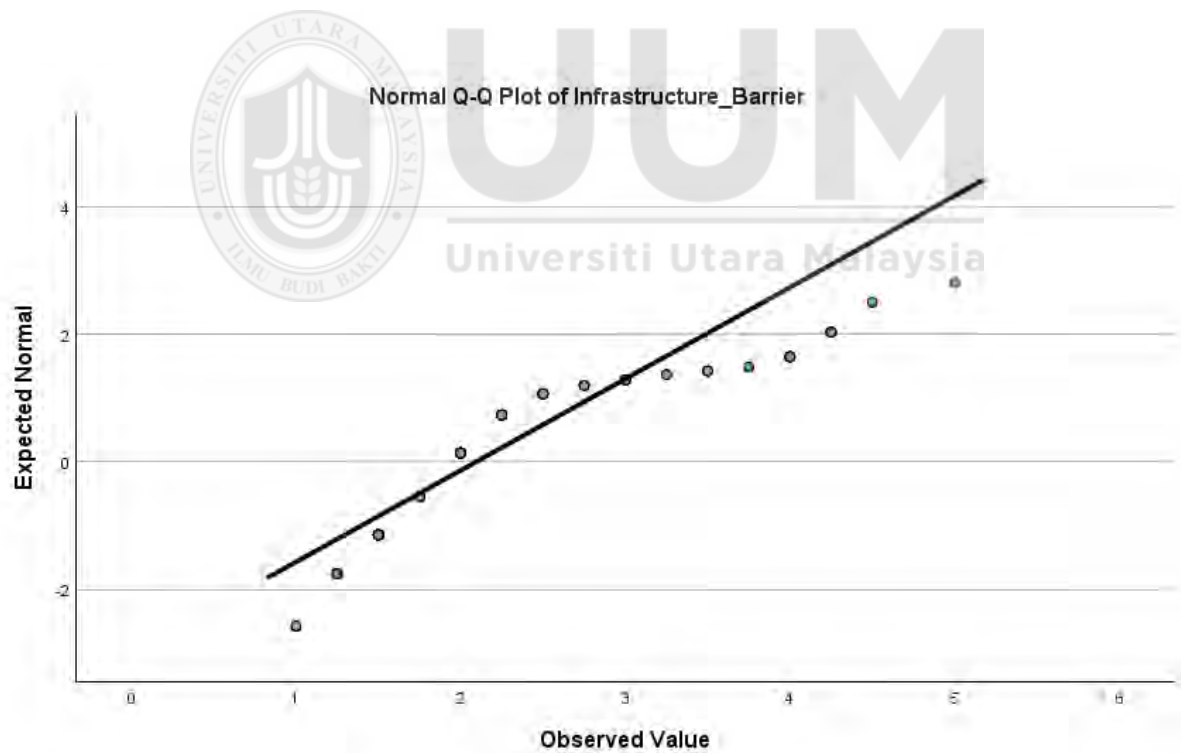


Figure: Normality Test of Infrastructure Barrier (IV 4)

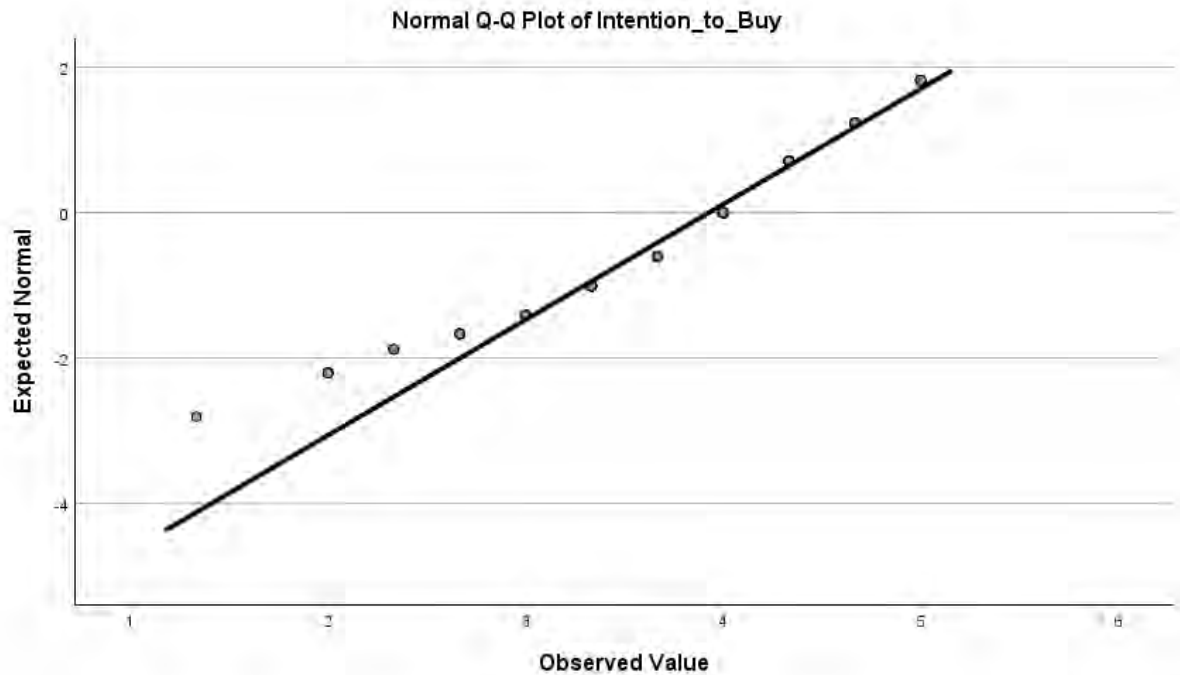


Figure: Normality Test of Intention to Buy (DV)

The displayed output presents a Normal Q-Q Plot representing the independent and dependent variables. The plot depicts that the data is not normally distributed, as evidenced by its deviation from the diagonal line. This assertion is further supported by the accompanying tables which indicate non-normal distribution of data points. Therefore, it can be concluded that all figures presented demonstrate evidence of abnormality due to their deviation from normality on this plot's diagonal line.

4.7: SPEARMAN'S RANK CORRELATION ANALYSIS

Spearman's Rank Correlation, denoted by the symbol ρ (rho), is a nonparametric metric used to measure rank correlation sets (Frost, 2021). It evaluates the degree of association between two variables and how well it can be described using a monotonic function. Spearman's correlation serves as an alternative to Pearson's correlation when dealing with curvilinear or ordinal data sets (Frost, 2021). This type of statistical analysis produces reliable results when compared variables exhibit monotonically related behaviour, even if this pattern does not manifest in linear fashion throughout all datasets involved. The Spearman coefficient functions via computing Pearson's product-moment correlations on ranked dataset values obtained from

assigning ranks 1 through n sequentially based upon ascending lowest-to-highest raw value ranges within respective ranking subgroups for continuous and discrete ordinal variable types alike (Patel, 2021). This approach allows for accurate modelling assessments while simultaneously enabling effective text document similarity evaluations across comparable samples using The Spearman Coefficient Formula defined as being equivalent mathematically speaking to that found in traditional applications: specifically operating under standard parameters governing interactions among rank-based correlational data structures commonly encountered within scientific research environments today—making them quite versatile tools indeed.

Grading Standards

Correlation Degree

$\rho = 0$	no correlation
$0 < \rho \leq 0.19$	very weak
$0.20 \leq \rho \leq 0.39$	weak
$0.40 \leq \rho \leq 0.59$	moderate
$0.60 \leq \rho \leq 0.79$	strong
$0.80 \leq \rho \leq 1.00$	very strong
1.00	monotonic correlation

Figure: Grading table of spearman correlation (Yan, 2019)

		Correlations					
			Price_Value	Perceived_Risk	Environmental_Concern	Infrastructure_Barrier	Intention_to_Buy
Spearman's rho	Price_Value	Correlation Coefficient	1.000	-.199**	.126*	-.149**	.031
		Sig. (2-tailed)	.	<.001	.012	.003	.531
		N	400	400	400	400	400
	Perceived_Risk	Correlation Coefficient	-.199**	1.000	-.129**	.343**	.057
		Sig. (2-tailed)	<.001	.	.010	<.001	.254
		N	400	400	400	400	400
	Environmental_Concern	Correlation Coefficient	.126*	-.129**	1.000	-.122*	.184**
		Sig. (2-tailed)	.012	.010	.	.015	<.001
		N	400	400	400	400	400
	Infrastructure_Barrier	Correlation Coefficient	-.149**	.343**	-.122*	1.000	-.031
		Sig. (2-tailed)	.003	<.001	.015	.	.538
		N	400	400	400	400	400
	Intention_to_Buy	Correlation Coefficient	.031	.057	.184**	-.031	1.000
		Sig. (2-tailed)	.531	.254	<.001	.538	.
		N	400	400	400	400	400

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

*, Correlation is significant at the 0.05 level (2-tailed).

In order to provide early indicators of prospective interrelationships in the various interactions, the Spearman's rank correlation analysis ρ (rho) is employed to characterize the strength and direction of bivariate relationships. The purpose of the test is to assess the level of correlation between two variables and their suitability for characterization through a monotonic function. Subsequently, a p-value may be computed based on the test statistic t . Should the calculated p-value fall below the predetermined level of significance (typically 5%), then it is deemed appropriate to reject the null hypothesis; otherwise, retention of said hypothesis is warranted.

The independent variable of "Environmental Concern" has significant correlation as the p-value registered as (<0.001) of which < 0.05 . Whereas all three other independent variables show no significant correlation as the p-value denotes more than 0.05: "Price Value" (0.531), "Perceived Risk" (0.254), "Infrastructure Barrier" (0.538). As since the independent variable of "Environment Concern" shows significant correlation, the degree of correlation is 0.184 ρ which falls under the very weak category. Whereas in terms of degree of correlation, the three others independent variable ("Price Value", "Perceived Risk", and "Infrastructure Barrier") falls under the negative correlation of 0.031 ρ , 0.057 ρ , and -0.31 ρ respectively.

4.8: HYPOTHESIS TEST

The relationship between Price Value and Purchase Intention

Hypothesis 1: Price Value and Purchase Intention of EV

H0: There is no significant relationship between price value and purchase intention of EV cars.

H1: There is a significant relationship between price value and purchase intention of EV cars.

The data obtained from the Spearman's correlation test based on table above indicates there is no significant correlation as the p value registered > 0.05 (0.531), and degree of correlation falls under the negative correlation as value marks as 0.031 ρ . Thus, researcher accepts null hypothesis (H0) and rejects alternative hypothesis (H1)

The relationship between Perceived Risk and Purchase Intention

Hypothesis 2: Perceived Risk and Purchase Intention of EV

H0: There is no significant relationship between perceived risk and purchase intention of EV cars.

H2: There is a significant relationship between perceived risk and purchase intention of EV cars.

The data obtained from the Spearman's correlation test based on table above indicates there is no significant correlation as the p value registered > 0.05 (0.254), and degree of correlation falls under the negative correlation as value marks as 0.057 ρ . Thus, researcher accepts null hypothesis (H0) and rejects alternative hypothesis (H2).

The relationship between Environmental Concern and Purchase Intention

Hypothesis 3: Environmental Concern and Purchase Intention of EV

H0: There is no significant relationship between environmental concern and purchase intention of EV cars.

H3: There is a significant relationship between environmental concern and purchase intention of EV cars.

The data obtained from the Spearman's correlation test based on table above indicates there is significant correlation as the p value registered < 0.05 (< 0.001), and degree of correlation falls under very weak correlation as value marks as 0.184 ρ . Thus, researcher accepts alternative hypothesis (H3) and rejects null hypothesis (H0).

The relationship between Infrastructure Barrier and Purchase Intention

Hypothesis 4: Infrastructure Barrier and Purchase Intention of EV

H0: There is no significant relationship between infrastructure barrier and purchase intention of EV cars.

H4: There is a significant relationship between infrastructure barrier and purchase intention of EV cars.

The data obtained from the Spearman's correlation test based on table above indicates there is no significant correlation as the p value registered > 0.05 (0.538), and degree of correlation falls under the negative correlation as value marks as $-0.031p$. Thus, researcher accepts null hypothesis (H_0) and rejects alternative hypothesis (H_4).



CHAPETR 5: CONCLUSION & RECOMMENDATION

5.1: INTRODUCTION

This chapter presents the findings derived from various analytical techniques, including descriptive analysis, reliability analysis and Spearman correlation. As detailed in Chapter 4 of this research study, these results were obtained with due consideration given to the underlying problem and prior research studies explored within an overview presented during Chapter 2. Furthermore, researcher explicitly identified their initial assumptions regarding hypothesis testing methodology employed as part of determining acceptance or rejection of their formulated hypothesis. Finally, an outcome objective incorporating insights gleaned in accordance with stated study objectives outlined at outset (Chapter 1) is further elaborated upon throughout this section.

5.2: KEY FINDINGS

The principal aim of this study is to ascertain the correlation between purchase intent for EVs and factors such as price value, perceived risk, environmental concern, and infrastructure barrier among Malaysian Generation X consumers. A total of 400 respondents participated in the survey which was analysed using SPSS Statistics software version 26. To ensure accuracy in results obtained from questionnaires administered during data collection, a reliability test was conducted with Cronbach's alpha coefficient on thirty participants in a pilot test whose outcomes indicated dependability greater than 0.7. Subsequent questionnaire reliability tests indicate sufficiency suitable for this research project.

To ensure continued investigation of insights from your data, it is imperative to assess the extent and nature of the association between independent and dependent variables. Reliability testing serves this purpose effectively. In order to guarantee validity and precision in every variable, they are scrutinized extensively during data analysis procedures. The utilization of Spearman's Correlation Analysis facilitated identification and resolution of goals for this study. The findings of Chapter 4 illustrate that Generation X consumers are inclined towards purchasing EVs as a result of certain environmental concern. The factors influencing the intention to purchase an electric car include price value, perceived risk, environmental concern, and infrastructure barrier, all of which are summarized in table below.

Hypothesis	Result	Finding of Data Analysis
H0: There is no significant relationship between price value and purchase intention of EV cars.	0.531p 0.031p	Hypothesis is rejected
H0: There is no significant relationship between perceived risk and purchase intention of EV cars.	0.254p 0.057p	Hypothesis is rejected
H3: There is a significant relationship between environmental concern and purchase intention of EV cars.	<0.001 p 0.184p	Hypothesis is accepted
H0: There is no significant relationship between infrastructure barrier and purchase intention of EV cars.	0.538p -0.031p	Hypothesis is rejected

Figure: Finding of the result.

5.3: DISCUSSION

ROI: To investigate the relationship between price value and purchase intention of EVs in Malaysia.

Based on results from spearman's correlation analysis, it shows that the price value has no significant relationship towards purchase intention of EVs. This result does not achieve the objective as there is no significant correlation as the p value registered > 0.05 (0.531), and degree of correlation falls under the negative correlation as value marks as 0.031p. It is essential to acknowledge that the influence of price on purchase intention can differ depending on consumer attributes. Consequently, although a correlation between pricing and value may not

be noteworthy in certain situations, it could exert considerable sway under alternative circumstances contingent upon several factors including antecedents and customer views.

Furthermore, (Dhawan, 2017) has suggested that the price point is a pivotal factor, while (Lashari, 2021) assert that aspects such as perceived utility, social status symbolism, ecological consciousness, economic advantages and buying expenditure are critical determinants. Further to this dimension of consumer behaviour analysis are factors including emotions and attitudes towards EVs, encompassing considerations like distance capacity range capability, acquisition expenses outlay, charging facility installation costs disbursement spent in operating it over time duration experienced by owners or users themselves. This constitutes an influential role on consumers' reception towards EVs (He, 2023).

RO2: To investigate the relationship between perceived risk and purchase intention of EVs in Malaysia.

Perceived risk is one of the predictors of the factors which influence purchase intention of EVs. This result does not achieve the objective as there is no significant correlation as the p value registered > 0.05 (0.254), and degree of correlation falls under the negative correlation as value marks as 0.057p. Referring to the results from spearman's correlation analysis, it shows that the perceived risk has no significant relationship towards purchase intention of EVs. This might be because perceived risk encompasses several concerns that prospective buyers may have, including the dependability of the vehicle, accessibility to charging infrastructure, maturity regarding technology and potential financial loss.

According to (Higueras-Castillo, 2023), the perceived risk of a product may not be considered as having an influential and direct connection with buying intent. This could potentially stem from heightened trust in EVs technology, enhancements in infrastructure development, and greater recognition around ecological matters that supersede apprehensions regarding possible risks associated with said products.

RO3: To investigate the relationship between environmental concern and the purchase intention of EVs in Malaysia.

Based on results from spearman's correlation analysis, it shows that the environmental concern has significant relationship towards purchase intention of EVs as to diminish carbon emissions and tackle issues stemming from environmental changes. This result achieves the objective as there is significant correlation as the p value registered < 0.05 (<0.001), and degree of correlation falls under very weak correlation as value marks as 0.184p. Environmental concern pertains to the level of consciousness and unease that individuals possess in relation to environmental issues, as well as their eagerness or inclination towards undertaking measures for mitigating negative impacts on the environment. This particular concern has been uncovered as a pivotal factor which motivates people towards buying EVs (Dutta, 2021). In essence, consumers who exhibit elevated levels of environmental concern are prone to viewing EVs favourably owing to their potential for making an affirmative impact upon the natural world by lessening carbon emissions- thereby reducing one's ecological footprint.

RO4: To investigate the relationship between infrastructure barrier and the purchase intention of EVs in Malaysia.

According to the results from spearman's correlation analysis, it shows that infrastructure barrier also has no significant relationship towards purchase intention of EVs. This result does not reach the objective as there is no significant correlation as the p value registered > 0.05 (0.538), and degree of correlation falls under the negative correlation as value marks as -0.031p. Although infrastructure barriers remain a consideration for prospective EVs purchasers, their effect on purchase intention may not be as pronounced as previously believed. An intricate interplay of diverse factors ultimately determines consumers' decision-making in this regard. With the EV market's ongoing evolution, it is imperative to monitor these dynamics and adapt strategies proactively to foster sustainable transportation growth.

It has been posited by certain studies that although consumers acknowledge the presence of infrastructure impediments, these might not have a substantial and direct link with purchase intention (Jayasingh, 2021). This could be attributed to other aspects such as environmental awareness, perceived financial benefits and social influence which appear more paramount in influencing consumer attitudes towards EVs (Lashari, 2021).

5.4: IMPLICATION

The findings of the study have significant implications for the EVs industry. The survey results suggest that Generation X consumers in Malaysia are more likely to choose for an EVs, owing to their awareness of its advantages. Furthermore, this investigation has facilitated several theoretical contributions towards future studies on this topic and highlights the increasing involvement of the automotive sector with EVs. It is evident from our research that it has greatly enhanced both empirical and theoretical understandings related to purchase intentions among Generation X customers looking forward to buying an EVs. Our analysis was grounded within a well-established theory widely known as Theory of Planned Behaviour (TPB). Particularly noteworthy is respondent's overwhelming environmental concern which indicates a strong inclination by Gen-Xers toward adopting environmentally friendly modes transportation options such EVs given they provide much needed relief in mitigating carbon footprint emissions. This suggests that if we incorporate these favourable outcomes into product marketing strategies targeted at wider demographic groups aiming specifically reduce CO₂ emission would be extremely beneficial when promoting EVs uptake across different generations (Thanh Tiep Le, 2023).

5.5: LIMITATION

The limitation of this study denotes a restriction in its scope, thereby potentially compromising the precision and thoroughness of research undertakings. In particular, focusing on Generation X consumers in Malaysia posed certain challenges as local participation was not entirely forthcoming due to some respondents' reluctance to participate fully in surveys administered by researchers. As such, the findings may not be entirely representative or applicable for their intended purposes given that key demographic information did not receive adequate coverage during data collection activities. Consequently, utilizing these results as a reliable guide is problematic under these circumstances whereby pertinent viewpoints have been omitted from consideration through non-response bias issues affecting survey participants.

A restricted timeframe was allocated for the execution of this study, which would impinge upon the precision and dependability of collected data. The researchers sought an extended duration to collect superior quality information, enhance reliability, receive requisite assistance

and enable a rigorous research undertaking. Additionally, stipulated timelines pose challenges regarding completion deadlines across all chapters since they cannot be feasibly achieved within set targets due to certain logistical constraints. For instance, disseminating over 350 questionnaires in such narrow confines poses complex logistical obstacles towards accomplishing qualitative findings as well conducting necessary analyses vitalizing Chapter Four that is yet pending finalization tying up key aspects with definitive dissertation fulfilment objectives indispensable to any substantive scholarly contribution per se undertaken herein distinctly by researcher ushering future progressions profoundly impactful!

5.6: RECOMMENDATION

The findings of this study offer valuable recommendations for the industry. The foremost suggestion pertains to devising targeted marketing strategies to promote EVs among Generation X in Malaysia, given that environmental concerns are a critical factor impacting their purchasing decisions regarding EVs. Therefore, automobile manufacturers should develop precisely tailored promotional campaigns aligned with the values and preferences of said demographic group by leveraging social media platforms and creating captivating content accentuating the ecological benefits of opting for an EVs while simultaneously addressing any related apprehensions experienced by these buyers.

Automotive manufacturers are able to foster collaboration with government-led initiatives. The study additionally highlights the influential role that governmental policies play in bolstering consumer confidence towards EVs purchases. In order to heighten appeal of EVs among Generation X, who make up the central buyer demographic within Malaysia's market, it is imperative for automotive industries to align themselves and participate in programs promoting sustainable transportation underlined by strong public-private partnerships. Among these efforts could be inclusive measures such as subsidy offerings or incentives aimed at encouraging purchase volume per capita along with substantial investment into developing infrastructure specific towards sustaining EV function ability alongside compellingly prioritizing human resource development enabling further progress of this industry.

Finally, it is incumbent upon automobile manufacturers to endeavour towards prioritizing affordability and accessibility in the context of EVs production. The automotive industry must make a concerted effort toward making EVs more economically accessible for baby boomers

through measures such as providing financing options, reducing component costs associated with EVs manufacturing processes while increasing its market availability. Addressing these critical obstacles will significantly enhance adoption prospects among Generation X consumers situated within Malaysia's demographic landscape.

5.7: CONCLUSION

This chapter has focused on the key findings that were derived from a comprehensive investigation pertaining to the intentions of individuals towards purchasing an EVs. The research was conducted in Malaysia through questionnaire surveys, under the supervision of qualified researchers. Through meticulous analysis and categorization techniques employed by these professionals, it was determined whether or not such objectives had been satisfactorily addressed based on survey data. The results obtained have shed light on various aspects related to EVs purchase decisions while offering a holistic view surrounding previous investigations into similar topics. Based upon extant literature supplied for this purpose, our study has gone beyond merely filling apparent gaps; we can confidently claim that valuable previews into studies dedicated entirely to exploring elements influencing intentionality toward buying an EV are provided herein with detailed reports containing penetration rates supporting claims made thus far. Given its potential as an environmentally friendly alternative solution aimed at reducing carbon dioxide emissions significantly compared with conventional combustion engine vehicles, predictably EVs have emerged as perhaps one most promising modes transportation whose time may come sooner rather than later, production-level investment might turn out very cost-effective.

REFERENCES

- Aalizadeh, R. N. (2022). A novel workflow for semi-quantification of emerging contaminants in environmental samples analyzed by LC-HRMS. *Analytical and Bioanalytical Chemistry*, 414(25), 7435-7450.
- Abbasi, H. A. (2021). Consumer Motivation by Using Unified Theory of Acceptance and Use of Technology towards Electric Vehicles. *MDPI*, 21.
- Ajzen, I. (2002). Constructing a TPB questionnaire: Conceptual and methodological considerations.
- Alghoul, M. A. (2018). The role of existing infrastructure of fuel stations in deploying solar charging systems, electric vehicles and solar energy: A preliminary analysis. *Technological Forecasting and Social Change*, 317-326.
- Asenahabi, B. M. (2019). Basics of research design: A guide to selecting appropriate research design. *International Journal of Contemporary Applied Researches*, 76-89.
- Balqis Al Braiki, S. H. (2020). Artificial intelligence in education and assessment methods. *Bulletin of Electrical Engineering and Informatics*, 10.
- Bernama. (19 1, 2023). *MAA EXPECTS MORE THAN 2631 EV UNITS TO BE SOLD THIS YEAR*. Retrieved from Bernama: <https://www.bernama.com/en/business/news.php?id=2157712>
- Bhandari, N. W. (2022). A comprehensive survey on computational learning methods for analysis of gene expression data. *Frontiers in Molecular Biosciences*, 9.
- Blumberg, B. C. (2014). Business research methods. *EBOOK*.
- Boeije, H. (2005). Data collection, primary versus secondary. *Encyclopedia of Social Measurement*, Volume I.
- Chan, M. (19 January, 2023). *EV sales in Malaysia increase to 2,631 units in 2022 – up 860% fr 2021; sales in 2023 “will be much higher”*. Retrieved from Paultan.Org: <https://paultan.org/2023/01/19/ev-sales-in-malaysia-increase-to-2631-units-in-2022-up-860-fr-2021-sales-in-2023-will-be-much-higher/>
- Chuan, C. L. (2006). Sample size estimation using Krejcie and Morgan and Cohen statistical power analysis: A comparison. *Jurnal Penyelidikan IPBL*, 78-86.
- Cristea, M. &. (2016). Attitude, perceived behavioral control, and intention to adopt risky behaviors. *Transportation research part F: traffic psychology and behaviour*, 157-165.

- Cronbach, L. J. (2004). My current thoughts on coefficient alpha and successor procedures. *Educational and psychological measurement*, 391-418.
- Descriptive Research | Definition, T. M. (22 June, 2023). *Descriptive Research | Definition, Types, Methods & Examples*. Retrieved from Scribbr: <https://www.scribbr.com/methodology/descriptive-research/>
- Dhawan, R. G. (2017). The future of mobility in India: Challenges & opportunities for the auto component industry. In *Automotive Component Manufacturers Association of India annual conference*, 1-36.
- Dutta, B. &. (2021). Consumers purchase intentions of green electric vehicles: The influence of consumers technological and environmental considerations. *Sustainability*, 13(21).
- Frost, J. (12 April, 2021). *Spearman's Correlation Explained*. Retrieved from Statistics By Jim: <https://statisticsbyjim.com/basics/spearman's-correlation/>
- Funke, S. Á. (2019). How much charging infrastructure do electric vehicles need? A review of the evidence and international comparison. *Transportation research part D: transport and environment*, 224-242.
- Geny, V. (2021). Key factors influencing Electric Vehicles adoption: A multidimensional meta-analysis. *Department of Industrial Economics at Blekinge Institute of Technology*, 49.
- Hamed Khazaei, M. A. (2021). Moderating effects of personal innovativeness and driving experience on factors influencing adoption of BEVs in Malaysia: An integrated SEM–BSEM approach. *Heliyon*, 1-21.
- He, Z. Z. (2023). Influence of emotion on purchase intention of electric vehicles: a comparative study of consumers with different income levels. *Current Psychology*, 42(25).
- Higuera-Castillo, E. S.-C. (2023). Factors affecting adoption intention of electric vehicle: a cross-cultural study. *Environment, Development and Sustainability*, 1-37.
- Huan Ngo, A. K. (2020). Optimal Positioning of Dynamic Wireless Charging Infrastructure in a Road. *Transportation Research and Development*, 53.
- Ibham Veza, M. A. (2022). Electric Vehicles in Malaysia and Indonesia: Opportunities and Challenges. *MDPI*, 24.
- Imenda, S. (2014). Is there a conceptual difference between theoretical and conceptual frameworks? *Journal of social sciences*, 185-195.
- Jayasingh, S. G. (2021). Factors influencing consumers' purchase intention towards electric two-wheelers. *Sustainability*, 13(22).

- Kagan, J. (11 January, 2024). *Investopedia*. Retrieved from Generation X (Gen X): Between Baby Boomers and Millennials: <https://www.investopedia.com/terms/g/generation-x-genx.asp>
- Kathrin Monika Buhmann, J. R. (2023). Consumers' preferences for electric vehicles: The role of status and reputation. *ELSEVIER*, 22.
- Kelley, K. &. (2013). Multiple regression. In *Handbook of quantitative methods for educational research*, 69-101.
- Khazaei H, T. M. (2021). Moderating effects of personal innovativeness and driving experience on factors influencing adoption of BEVs in Malaysia: An integrated SEM-BSEM approach. *Heliyon*, 21.
- Koty, A. C. (8 6, 2022). *Electric Vehicles in Malaysia: Tax Incentives for Owners and Manufacturers*. Retrieved from ASEAN BRIEFING: <https://www.aseanbriefing.com/news/electric-vehicles-in-malaysia-tax-incentives-for-owners-and-manufacturers/>
- Lashari, Z. A. (2021). Consumers' intention to purchase electric vehicles: Influences of user attitude and perception. *Sustainability*, 13(12).
- Lim, A. (15 6, 2023). *Still a lack of EV charging stations in Malaysia – MOSTI*. Retrieved from PAULTAN.ORG: [https://paultan.org/2023/06/15/still-a-lack-of-ev-charging-stations-in-malaysia-mosti/#:~:text=As%20of%20September%20last%20year,to%20science%2C%20technology%20and%20innovation%20\(](https://paultan.org/2023/06/15/still-a-lack-of-ev-charging-stations-in-malaysia-mosti/#:~:text=As%20of%20September%20last%20year,to%20science%2C%20technology%20and%20innovation%20()
- Loeb, S. D. (2017). Descriptive Analysis in Education: A Guide for Researchers. *National Center for Education Evaluation and Regional Assistance*, 53.
- McCombe, P. A. (2022). Effects of biological sex and pregnancy in experimental autoimmune encephalomyelitis: It's complicated. *Frontiers in Immunology*, 13.
- MGTC. (2023). *Malaysian Government drafting strategic framework to develop EV charging infrastructure*. Malaysia: Malaysian Green Technology And Climate Change Corporation.
- MIDA. (31 10, 2022). *MALAYSIA'S SHIFT TOWARDS GREEN MOBILITY*. Retrieved from MIDA: <https://www.mida.gov.my/malaysias-shift-towards-green-mobility/>
- Moan, I. S. (2013). Whether or not to ride with an intoxicated driver: Predicting intentions using an extended version of the theory of planned behaviour. *Transportation research part F: traffic psychology and behaviour*, 193-205.

- Moses, M. (15 February, 2020). *Benefits of electric cars on the environment*. Retrieved from EDF Energy: <https://www.edfenergy.com/energywise/electric-cars-and-environment>
- Mou, J. C. (2022). A test of protection motivation theory in the information security literature: A meta-analytic structural equation modeling approach. *Journal of the Association for Information Systems*, 196-236.
- Muzir NAQ, M. M. (2022). Challenges of Electric Vehicles and Their Prospects in Malaysia: A Comprehensive Review. *Sustainability*, 40.
- Nadia Adnan, S. M. (2017). A new era of sustainable transport: An experimental examination on forecasting adoption behavior of EVs among Malaysian consumer,. *Transportation Research Part A: Policy and Practice*, 79-295,.
- Nayak, S. D. (2019). Strengths and Weaknesses of Online Surveys. *OSR Journal of Humanities and Social Sciences*, 31-38.
- NC, J. (2006). Designing A Questionnaire. *Malays Fam Physician*, 1-4.
- Nisa, S. K. (2022). Sustainable transport utilisation: a study on factors influencing electric vehicle adoption intention. *INDERSCIENCE ONLINE* , 19.
- Nur Ayesha Qisteena Muzir, M. R. (2022). Challenges of Electric Vehicles and Their Prospects in Malaysia: A Comprehensive Review. *Sustainability*, 1-40.
- Okamura, K. F. (2012). Predicting motivational determinants of seatbelt non-use in the front seat: A field study. *Transportation research part F: traffic psychology and behaviour*, 502-513.
- Okeoghene, O. B. (2021). MULTIPLE LINEAR REGRESSION MODEL: A STATISTICAL TOOL FOR PREDICTION OF SCORES OF FINAL YEAR MATHEMATICS DEGREE STUDENTS OF THE COLLEGE OF EDUCATION, AGBOR IN AFFILIATION WITH DELTA STATE UNIVERSITY, ABRAKA. *Abacus (Mathematics Science Series*, 48(2).
- Pallant, J. F. (2016). Assessment of the dimensionality of the Wijma delivery expectancy/experience questionnaire using factor analysis and Rasch analysis. *BMC pregnancy and childbirth*, 1-11.
- Patel, K. (26 March, 2021). *What Is Spearman's Rank Correlation and How Is It Useful for Business Analysis?* Retrieved from DATAVERSITY: <https://www.dataversity.net/what-is-spearman's-rank-correlation-and-how-is-it-useful-for-business-analysis/>
- Petra Zsuzsa Lévy, Y. D. (2017). The effect of fiscal incentives on market penetration of electric vehicles: A pairwise comparison of total cost of ownership. *ELSEVIER*, 10.

- Rowley, J. (2014). Designing and using research questionnaires. *Management research review*, 308-330.
- Saidi, S. S. (2019). Investigating the Validity and Reliability of Survey Attitude towards Statistics Instrument among Rural Secondary School Students. *International journal of educational methodology*, 651-661.
- Sang, Y. N. (2015). Modelling electric vehicle usage intentions: an empirical study in Malaysia. *Journal of Cleaner Production*, 75-83.
- Saunders, J. A.-R. (2012). CD4+ regulatory and effector/memory T cell subsets profile motor dysfunction in Parkinson's disease. *Journal of Neuroimmune Pharmacology*, 927-938.
- Sekaran, U. &. (2016). Research methods for business: A skill building approach. *john wiley & sons*.
- Shahla Asadi, M. N. (2020). Factors Impacting Consumers' Intention toward Adoption of Electric Vehicles in Malaysia. *Journal of Cleaner Production*, 37.
- Shahla Asadi, M. N. (2022). Drivers and barriers of electric vehicle usage in Malaysia: A DEMATEL approach. *Resources, Conservation, and Recycling*, Volume 177.
- Sibanda, M. (2019). Decision-making in English Clinical Commissioning groups: A mixed methods study. *heffield Hallam University (United Kingdom)*.
- Silvana Secinaro, D. C. (2022). Electric vehicles' consumer behaviours: Mapping the field and providing a research agenda. *ELSEVIER*, 18.
- Simo-Tagne, M. E. (2022). Energy, environmental and economic analyses of an indirect cocoa bean solar dryer: A comparison between natural and forced convections. *Renewable energy*, 1154-1172.
- Sousa, S. F. (2007). General performance of density functionals. *The Journal of Physical Chemistry A*, 111(42).
- Stambouli, A. B. (2002). Fuel cells, an alternative to standard sources of energy. *Renewable and sustainable energy reviews*, 295-304.
- Sukamolson, S. (2007). Fundamentals of quantitative research. *Language Institute Chulalongkorn University*, 1-20.
- Taherdoost, H. &. (2021). Empirical modeling of customer satisfaction for E-services in cross-border E-commerce. *Electronics*, 10(13), 1547.
- Tavakol, M. &. (2011). Making sense of Cronbach's alpha. *International journal of medical education*, 53.
- Tavakol, M. &. (2011). Making sense of Cronbach's alpha. *International journal of medical education*, 53.

- Thanh Tiep Le, F. J. (2023). What drives purchase behavior for electric vehicles among millennials in an emerging market. *Journal of Cleaner Production*, Volume 428.
- Vankov, D. S. (2021). Understanding the predictors of young drivers' speeding intention and behaviour in a three-month longitudinal stud. *Accident Analysis & Prevention*, 151.
- Wang, X. S. (2021). Exploring the effects of the built environment on commuting mode choice in neighborhoods near public transit stations: Evidence from China. *Transportation planning and technology*, 4(1), 111-127.
- Weeberb J. Requia, M. M. (2017). How clean are electric vehicles? Evidence-based review of the effects of electric mobility on air pollutants, greenhouse gas emissions and human health. *Atmospheric Environment*, 1-40.
- Yan, Z. &. (2019). Meteorological Factors Affecting Pan Evaporation in the Haihe River Basin and China. *Water. Research Gate*, 18.
- Yasir Lashram, A. S. (2024). Navigating challenges in the transition to green transportation: A perception study exploring factors influencing drivers' intentions for electric vehicle adoption. *AIP Advances*, 1-15.
- Yew-Ngin Sang, H. A. (2015). EXPLORING FACTORS INFLUENCING ELECTRIC VEHICLE USAGE INTENTION: AN EMPIRICAL STUDY IN MALAYSIA. *International Journal of Business and Society*, 18.
- Young, R. J. (2020). Postcolonialism: A very short introduction. *Oxford University Press*.
- Yusoff, R. &. (2014). Generation of an interval metric scale to measure attitude. *Sage Open*, 2158244013516768.
- Zeinab Rezvani, J. J. (2015). Advances in consumer electric vehicle adoption research: A review and research agenda. *ELSEVIER*, 15.
- Zimm, C. (2021). Improving the understanding of electric vehicle technology and policy diffusion across countries. *Transport Policy*, Volume 105.

APPENDIX

SECTION A: DEMOGRAPHIC ATTRIBUTES

1. Gender

"What gender do you identify as?"

- A. Male
- B. Female
- C. Prefer not to say.

2. Age

"What is your age?"

- A. 41-46 years old
- B. 47-50 years old
- C. 51-56 years old
- D. Others

3. Ethnicity

"Please specify your ethnicity."

- A. Malay
- B. Chinese
- C. Indian
- D. Others

4. Education

"What is the highest degree or level of education you have completed?"

- A. High School
- B. Bachelor's Degree
- C. Master's Degree
- D. Ph.D. or higher

5. Marital Status

"Are you married?"

- A. Married
- B. Single
- C. Others

6. Vehicles Driving Experience

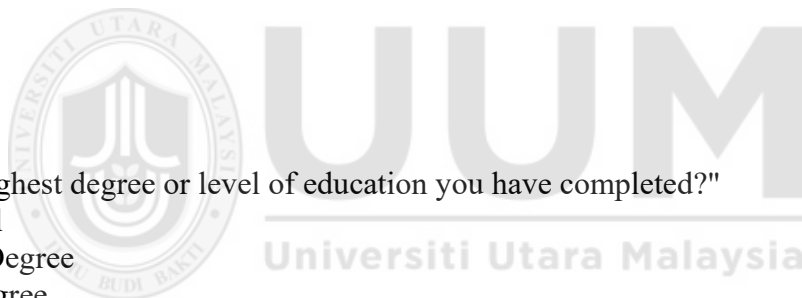
"State your driving experience".

- A. < 5 years
- B. 5-10 years
- C. 11-16 years
- D. >16 years

7. Monthly Household Income

"What is your annual household income (RM)?"

- A. <3,000
- B. 3,000-6,000



- C.6,001-9,000
- D.9,0001-12,000
- E.12,001-15,000
- F.>15,000

8.Current Locality

“Which locality do you live in?”

- A. Urban
- B. Sub-urban
- C. Rural

SECTION B: PRICE VALUE (PV)

1.In my opinion electric car is reasonably priced.

- 1.Strongly agree
- 2.Agree
- 3.Neutral
- 4.Disagree
- 5.Strongly Disagree

2. In my opinion electric car offer value for money.

- 1.Strongly agree
- 2.Agree
- 3.Neutral
- 4.Disagree
- 5.Strongly Disagree

3. In my opinion electric car is economical in the long run.

- 1.Strongly agree
- 2.Agree
- 3.Neutral
- 4.Disagree
- 5.Strongly Disagree

SECTION C: PERCEIVED RISK (PR)

1. In my opinion electric car would lead to a financial loss for me.

- 1.Strongly agree
- 2.Agree
- 3.Neutral
- 4.Disagree
- 5.Strongly Disagree

2.In my opinion electric car might not perform well and create problems.

- 1.Strongly agree
- 2.Agree
- 3.Neutral
- 4.Disagree
- 5.Strongly Disagree

3. In my opinion using electric car would be risky.

- 1.Strongly agree
- 2.Agree
- 3.Neutral
- 4.Disagree
- 5.Strongly Disagree

SECTION D: ENVIRONMENTAL CONCERN (EC)

1.Supporting environmental protection makes me feel that I'm an environmentally responsible person.

- 1.Strongly agree
- 2.Agree
- 3.Neutral
- 4.Disagree
- 5.Strongly Disagree

2.I feel proud of being a green person.

- 1.Strongly agree
- 2.Agree
- 3.Neutral
- 4.Disagree
- 5.Strongly Disagree

3.Supporting environmental protection makes me feel meaningful.

- 1.Strongly agree
- 2.Agree
- 3.Neutral
- 4.Disagree
- 5.Strongly Disagree

SECTION E: INFRASTRUCTURE BARRIER (IB)

1.In my opinion the public infrastructure for electric car is available.

- 1.Strongly agree
- 2.Agree
- 3.Neutral
- 4.Disagree
- 5.Strongly Disagree



2. In my opinion the electric car infrastructure at work is available.

- 1.Strongly agree
- 2.Agree
- 3.Neutral
- 4.Disagree
- 5.Strongly Disagree

3. In my opinion the electric car infrastructure at home is available.

- 1.Strongly agree
- 2.Agree
- 3.Neutral
- 4.Disagree
- 5.Strongly Disagree

4. In my opinion the electric car infrastructure on highway is available.

- 1.Strongly agree
- 2.Agree
- 3.Neutral
- 4.Disagree
- 5.Strongly Disagree

SECTION F: INTENTION TO BUY (INT)

1. When I have/need to buy a new car, I'm willing to buy an electric car

- 1.Strongly agree
- 2.Agree
- 3.Neutral
- 4.Disagree
- 5.Strongly Disagree

2. When I have/need to buy a new car, I'm planning to buy an electric car

- 1.Strongly agree
- 2.Agree
- 3.Neutral
- 4.Disagree
- 5.Strongly Disagree

3. When I have/need to buy a new car, I opt to buy an electric car

- 1.Strongly agree
- 2.Agree
- 3.Neutral
- 4.Disagree
- 5.Strongly Disagree