CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This section will briefly describe the research method used to gain an in-depth understanding of the study. Section 3.2 explains the research design of the study, whilst Section 3.3 discusses the research approach. The population and sampling are discussed in Section 3.4. Data collection and data analysis methods are presented in Section 3.4 and Section 3.5, respectively. Then, the pilot study for this research is demonstrated in Section 3.7. Finally, the conclusion of this chapter is discussed in Section 3.8.

3.2 Research Design

Research design is a structure of the research known as a blueprint or plan of a proposed research work that holds the elements in a research project, such as collecting, measuring, and analysing data to answer the research questions (Akhtar, 2016; Sekaran & Bougie, 2016). McMillan and Schumacher (2001) define it as a plan for selecting subjects, research site, and data collection procedures to answer the research question. In addition, Zikmund et al. (2013) define it as a master plan that specifies the methods and procedures for collecting and analyzing the needed information.

Research design is a strategic framework designed to carry out the research in a systematic way by adhering to a specific procedure and collecting the appropriate data for interpretation. Early on in the research process, the objective of the study is clearly outlined. Akhtar (2016) points out that the quantitative research design should be

developed once the problems have been identified, the objectives outlined, the concepts defined, and the hypothesis appropriately framed.

In conducting this study, it is crucial to determine the types of research designs to ensure that the research procedure goes smoothly (Akhtar, 2016). According to Zikmund et al. (2013), a research design can be divided into three types namely exploratory, descriptive and causal. Exploratory research is conducted at the primary stage of a research that aims to formulate a new solution for the problems with a more proper investigation. This is applied when new potential business opportunities have been discovered, which have not been explored by earlier researchers or only by a few researchers. Therefore, the research focuses on gaining insight into the subject area and is more useful in new product development.

A descriptive or statistical research describes the characteristics of objects, people, group, and organizational characteristics. In other words, it represents the market segments (Zikmund et al., 2013) and also describes the social events, social structure and social situations to answer the questions of what, who, where, how and when (Akhtar, 2016).

On the other hand, causal research intends to identify cause and effect relationships. It measures the effect of the independent variables on the dependent variable by analyzing it to form a conclusion. Hence, the research design of a causal research was chosen as the best option for this current study. This study aims to determine the relationship between political trust, government's integrity, competence and accountability with the public acceptance of carbon tax in Malaysia. Figure 3.1 presents the summary of the research process for this study.

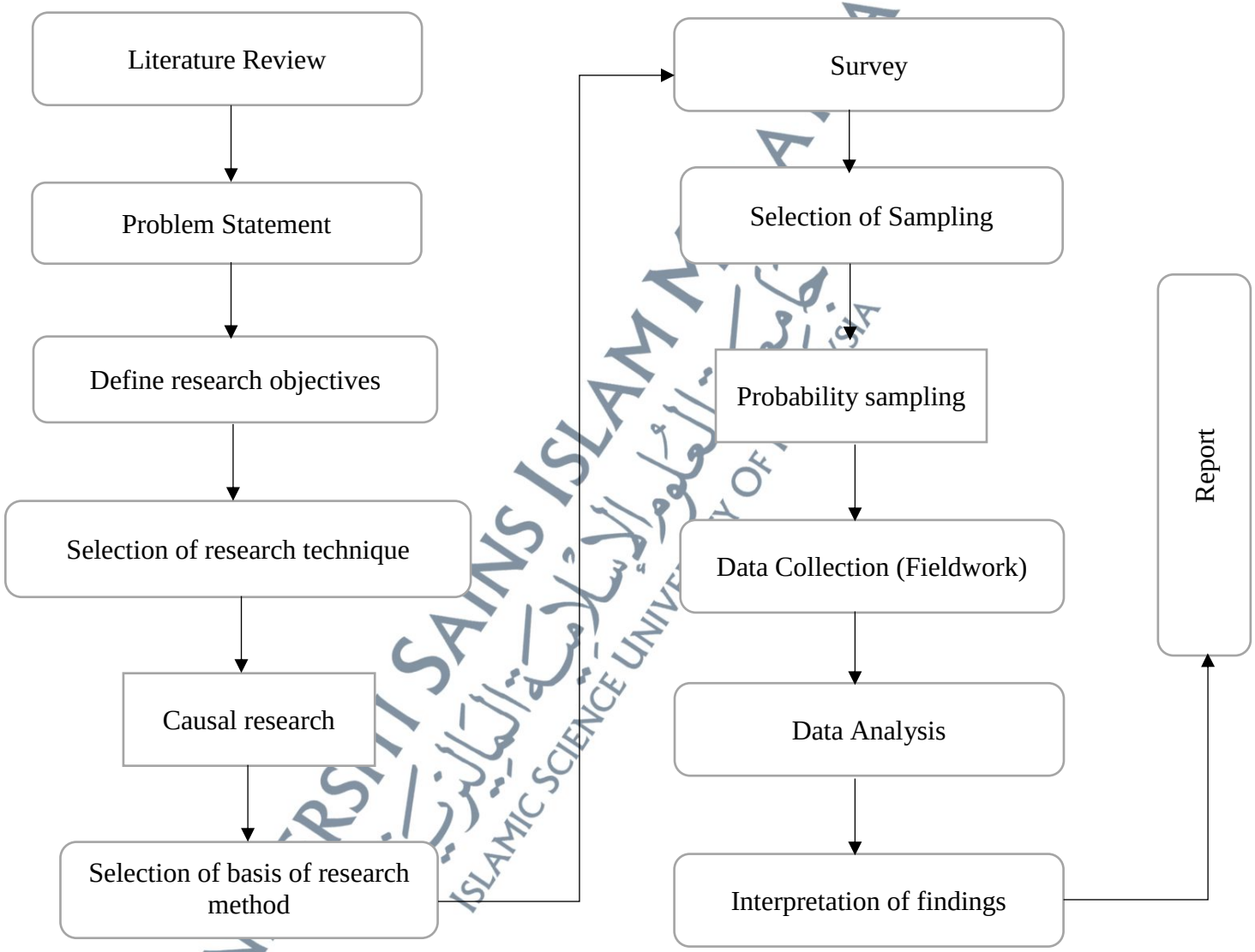


Figure 3.1: Summary of Research Process

3.3 Research Approach

Research approaches are research plans and procedures that include everything from broad to specific techniques such as data collection, data analysis, and interpretation. Three common research approaches include quantitative, qualitative and mixed-method research.

The quantitative research method was adopted from the philosophy of positivism and post-positivism, which believes that the social world can be understood in an objective way and is observable, stable and measurable (Žukauskas et al., 2018). The positivism perspective states that the goal can be understood as a universal truth, a rule or explanation that is always true so long as specified conditions are met. Science is used to gain the truth about the world because through it, we can observe, predict, measure and control it (Reed, 2010). Therefore, the quantitative method is replicable as the research relies on hypothesis testing (Daniel, 2016). Existing theories are used to develop a hypothesis which is then tested and proved correct, making the experiment a fundamental part of the quantitative approach (Trochim, 2006; Žukauskas et al., 2018).

A deductive approach is used to postulate theories. In achieving the result on the tested theory, the relationship among the variables is examined to get the quantified data. The variables of the study are measured so that the numbered data could be analysed using statistical procedures. Furthermore, disciplines such as mathematics and statistics become fundamental in the study process, making the finding reliable and robust. This method also ensures the validity of the study by applying the process of rigorous clarification, definition, and pilot experiments.

Moreover, the quantitative method can be administered and evaluated quickly as the responses from the data collection can be tabulated within a short time frame. It

uses statistical software such as Statistical Package for Social Sciences (SPSS), Minitab, Statistical Analysis System (SAS), R-programming, Statistic and Data (STATA), Structural Equation Modeling using Analysis of Moment Structures (SEM-AMOS), Structural Equation Modeling using the Partial Least Squares path modeling (SEM-PLS), and graphical user interface using the Partial Least Squares path modeling (WarpPLS) (Ong & Puteh, 2017). According to Bryman (2013), the quantitative approach emphasises numbers and figures in collecting and analysing data which reduces the time and effort in finding the results because the data can be calculated and conducted using computer software. Besides that, the findings can be generalised to the whole population or sub-population, and the larger sample can be randomly selected (Rahman, 2017). However, the quantitative method also has its weaknesses such as the lack of large-scale research resources (Choy, 2014). Due to a lack of skills and resources required to conduct a thorough quantitative evaluation, it will be impossible for a researcher to find a large-scale population when conducting a research with a significant sample size. As the quantitative research method adopts the philosophy of positivism, it leaves out the ordinary meaning of social phenomena and does not explain the context of the phenomena.

On the other hand, the qualitative research method adopts the ideographic understanding of interpretivism philosophy, emphasising that humans create meaning and are different from physical phenomena (Saunders et al., 2009). An interpretivist research aims to develop new knowledge and achieve rich understanding only through subjective interpretation and intervention. This approach studies the phenomenon of how people describe things and experience them through their senses because the researcher needs to understand the views of human thought and human behaviour in a

social context, such as their interaction, thought process, reasoning, composition and norms, to create a close relationship between the researcher and the respondents.

Furthermore, a qualitative research analyses the world by interpreting reality and understanding it through social construction such as language, consciousness, shared meaning and instruments (Myers, 2009). The qualitative data uses the instrument to give a full description of the research, such as observation, open-ended questions, in-depth interviews and field notes. For example, interviews allow the researcher to investigate and prompt things that cannot be observed; thus, the researcher can probe and interviewee's thoughts, values, prejudices, perceptions, views, feelings and perspectives (Wellington & Szczerbińsk, 2007). As a result, the researcher gains better insight into further actions. Complex issues can easily be understood because the participant has sufficient freedom to determine what is consistent in giving the information for the research study (Atieno, 2009).

However, this approach abandons the scientific methods and procedures of enquiry and investigation. As this approach is used to interpret the data, it can be said that there is no verification of the truth statement made by the researcher since the approach is characterized by feelings and personal reports; thus, it cannot give reliable and consistent data. In addition, the process is time-consuming (Choy, 2014), and the finding could not be extended to broader populations.

A mixed-method research is a method that includes both quantitative and qualitative approaches where it focuses on both numeric and narrative data and analyses. The mixed-method approach is called pragmatism, introduced by the American philosophers Charles Pierce, William James and John Dewey (Hookway, 2020; Saunders et al., 2009). The word pragmatism was derived from the Greek word "pragma", which means action (Pansiri, 2005), which describes the concept of

pragmatism itself as the knowledge that arises from actions, situations, consequences and solutions to problems (Creswell, 1993). Pragmatism holds that human activity could not be separated by past experiences and beliefs originating from those experiences. Individuals act as they do because they are aware of the potential consequences of their actions and because they use the results of previous actions to predict the outcomes of future ones (Kaushik & Walsh, 2019). In addition, this philosophy believes that reality is not static; it changes over time because of human action.

This study adopted the philosophy of positivism in order to get the truth about the world by observing, predicting, measuring and controlling. Therefore, a quantitative research approach was chosen because this research is reliable in hypothesis testing. As quantitative methodology employs numerical data to quantify the social phenomenon, and SPSS was chosen as the best technique to analyse the findings of the study accurately. Thus, performing the quantitative research will help the researcher examine the level of public trust in the government to accept carbon tax. Previous studies on public acceptance of carbon tax had adopted the same quantitative approaches (Fairbrother et al., 2019; Hammar & Jagers, 2006). Moreover, as this study attempts to test the hypothesis to answer the research questions, this approach is deemed the best for this study.

3.4 Population and Sampling

3.4.1 Sampling Design

Sampling can be defined as a procedure that draws conclusions by measuring a portion of the population (Zikmund et al., 2013). When conducting a research study, it

is critical to select a specific population to ensure that the data needed to answer the objectives of the study can be obtained.

3.4.1.1 Target Population

Population can be understood as the entire group of people, events, or things of interest that the researcher intends to investigate (Sekaran & Bougie, 2016). As this study aims to gain insight into public acceptance of carbon tax implementation in Malaysia, the target population for this study consists of Malaysians over the age of 18 who reside in Malaysia. The reason for choosing people above 18 years old is because most past studies on carbon tax had conducted surveys among people over 18 years old (Baranzini & Carattini, 2017; Fairbrother et al., 2019; Goh & Matthew, 2021). The sampling process needs to be conducted to get a sufficient number of the right elements from the population. Furthermore, sampling allows the researcher to collect data from a small group of the population instead of the entire population, and the results can be generalized to the whole population.

3.4.1.2 Sampling Frame and Sampling Population

A sampling frame is a list of elements in the population used to obtain a sample (Sekaran & Bougie, 2016). For this study, Malaysia's population is 21.1 million (Suruhanjaya Pilihan Raya Malaysia, 2022). To generalize the sample, the entire group of Malaysian citizens is included whereby the citizens must be currently living in Peninsular Malaysia, Wilayah Persekutuan Labuan, Sabah and Sarawak. This means that all Malaysian citizens aged above 18 years old can be regarded as the sampling frame. This study is interested in knowing whether public trust in the government influences their support for carbon tax implementation.

3.4.1.3 Sampling Elements

Sampling elements refer to individual respondents who possess the necessary information for the study (Sekaran & Bougie, 2016). In this study, individuals who live in Peninsular Malaysia, Wilayah Persekutuan Labuan, Sabah and Sarawak, and aged above 18 are considered as the sampling elements.

3.4.1.4 Sampling Technique

The sampling technique selects an individual or a subset of the population to make statistical inferences. There are two primary types of sampling techniques namely probability sampling and non-probability sampling. Probability sampling was chosen for this study because each sampling frame has a known and non-zero chance of being selected as subjects (Sekaran & Bougie, 2016). This sampling can either be simple random sampling or complex probability sampling. As this study intends to generalize the sample to the entire population, complex probability sampling was chosen as the best sampling technique. Complex random sampling consists of five common sampling designs: systematic sampling, stratified random sampling, cluster sampling, area sampling, and double sampling.

Systematic sampling is performed by choosing the sample at a regular interval, starting from a random point of the sampling frame. For stratified random sampling, the element of the sample is selected by dividing the population into several sub-groups and the chosen sample based on the criteria. In cluster sampling, the population is divided into clusters in cluster sampling, and the sample is drawn from the selected cluster. On the other hand, area sampling refers to the cluster of geographic areas where the sample is selected by clustering the geographic area into cities, counties and others. Double sampling is a type of sampling technique used

when the research intends to recollect the sample from the sub-sample of the primary sampling. Therefore, area sampling was selected in this current study as the best method for selecting a sample from the entire research population.

Area sampling has the advantage of being cost-effective. This is because it reduces the cost of contacting the respondents of the population when distributing the survey questionnaire (Hair et al., 2020; Sekaran & Bougie, 2016). However, area sampling requires a significant amount of time and effort to collect data. Therefore, this study decided to use area sampling method because the advantages outweighed the disadvantages. The population were divided into 16 areas based on the number of state (Kementerian Komunikasi dan Multimedia Malaysia, 2019). Table 3.1 shows the areas involved in this study.

Table 3.1: Areas and States Involved

Area No.	States
1	Johor
2	Kedah
3	Kelantan
4	Melaka
5	Negeri Sembilan
6	Pahang
7	Perak
8	Perlis
9	Pulau Pinang
10	Sabah
11	Sarawak
12	Selangor
13	Terengganu
14	Wilayah Persekutuan Kuala Lumpur
15	Wilayah Persekutuan Labuan
16	Wilayah Persekutuan Putrajaya

3.4.1.5 Determination of Sample Size

In conducting a quantitative research, it is challenging to collect all the data from the respondents. Determining the right number of sample size is important to ensure that the sample size represents the whole population of the study. Previous studies had used various methods to identify the number of sample size, including Krejcie and Morgan (1970), Sekaran and Bougie (2016) and Hair et al. (2020). There are also numerous software that can be used to calculate the sample size, such as MINSIZE2 (Morse, 1999) and G Power (power analysis) introduced by Cohen (1962), which calculate the needed sample size with respect to the analysis techniques and defined significant values.

Krejcie and Morgan (1970) provided a guideline that simplifies sample size selection. Table 3.2 presents the table of the population (N) and sample (S) proposed by Krejcie and Morgan (1970). In this study, the researcher relied on the guidelines provided by Krejcie and Morgan (1970) in determining the number of samples based on the population. As the number of the Malaysian population is 21.1 million, the appropriate number of samples is 384.

Table 3.2: Table for Determining Sample Size from a Given Population

N	S	N	S	N	S
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	180	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	1000000	384

Source**:** Krejcie & Morgan (1970)

3.5 Data Collection Method

The data collection method plays a crucial role in conducting a research as it is the process of gathering and measuring information and establishing a systematic data collection to be analysed (Sekaran & Bougie, 2016). At the beginning of the data collection process, the researcher needs to identify the nature of the study and the research objectives to select the types of data collection for their research. In data collection, there are two types of data namely primary data and secondary data. Data collection begins by examining the secondary data such as government publications, websites, books, and journal articles. Next, primary data include surveys, observations, experiments, questionnaires, observations, and interviews (Hair et al., 2020).

For this study, quantitative research was adopted. The data were obtained from primary sources through survey research method. The survey questionnaire was

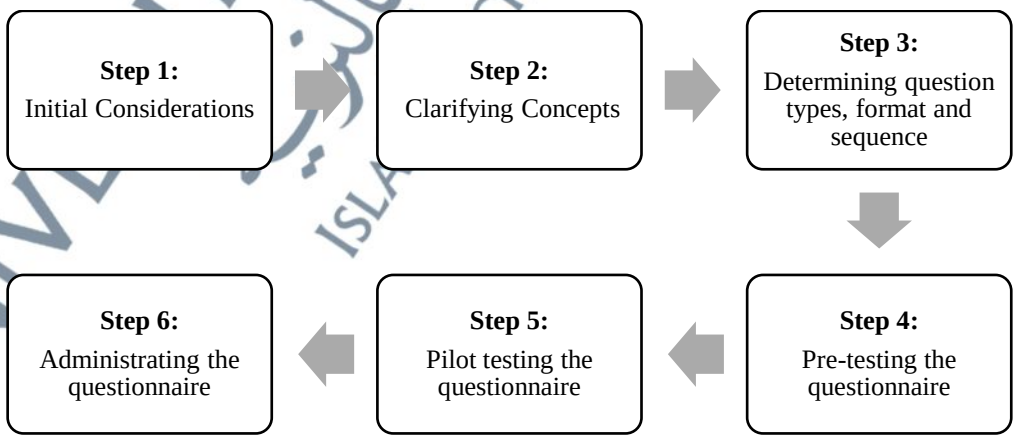
adopted to collect the data needed for the study and answer the research questions. The questionnaire was distributed via online to the respondents.

3.5.1 Questionnaire Design

A questionnaire is one of the general designs used by researchers to obtain large quantities of data by answering a set of questions (Hair et al., 2020). It is crucial to design the questionnaire appropriately to collect the information needed. This is because this is the only opportunity to interact with the respondents. Therefore, this study developed a questionnaire design based on the survey design by Hair et al. (2019).

3.5.2 Questionnaire Design Procedure

The researcher designed the survey questionnaire in order to meet the research objectives and answer the research questions. Thus, the questionnaire was properly constructed and follow a systematic process to ensure that the final outcome of the data is reliable and valid (Hair et al., 2020). Below in Figure 3.2, the steps of the questionnaire design procedure is described:



Source: Hair et al. (2019)

Figure 3.2: Steps in Questionnaire Design Procedure

Step 1: Initial Considerations

The first step is identifying the problems of the study, clarifying the objective of the study, and set out the research questions. Since this study wants to examine the four variables, the researcher obtained the survey questions for each variable from several literatures (Davidovic & Harring, 2019; Fairbrother et al., 2019; Jagers et al., 2010; Kallbekken & Sæælen, 2011; J. Kim et al., 2013; Kitt et al., 2021).

After having this core information, it is important to identify the sampling approaches for the study and the data collection method of the study. An effective survey distribution strategy increases the survey response rates, as well as the quality of the data collected. A questionnaire can be disseminated in a number of ways such as personal administration (paper-based distribution); via mail, and electronic and online modes (Sekaran & Bougie, 2016).

Paper-Based Distribution

For local surveys, personally administering questionnaires is a good way to collect data. In this way, the researcher or a member of the research team can quickly gather completed responses. Any questions that the respondents have can be answered immediately. The researcher can also introduce the research topic and encourage respondents to be honest. In addition, a paper-based distribution is less expensive and takes less time to administer to a large number of individuals at the same time than an interview. Furthermore, administering a questionnaire does not necessitate the same level of expertise as conducting an interview. In contrast, there is a risk that the researcher would introduce bias into their data by asking the respondents to answer questions in a way that differs from the way the questions were asked, particularly to

those who received the questionnaire by mail. Furthermore, completing questionnaires by hand requires considerable time and effort.

Mail Questionnaires

This type of questionnaire is self-administered (paper-and-pencil) via mail. Mail questionnaires have long been the backbone of business research, but they are now obsolete with the advent of the Internet and social media. Instead, online surveys are posted online or sent via email (Sekaran & Bougie, 2016).

Electronic and Online Questionnaires

Electronic or online questionnaires can be distributed quickly and easily. Online questionnaires are frequently used to gain a deeper understanding of the respondents' views and preferences. With online survey research, a researcher can reach a wider range of people and groups because the Internet makes it possible. Respondents that receive a link to a questionnaire can complete it at their own pace and convenience. Moreover, online questionnaires save even more money, time, and effort. Currently, survey development software packages and online survey services make online survey research considerably more convenient and accessible (Sekaran & Bougie, 2016).

However, there are also important disadvantages to online questionnaires. When performing online research, researchers typically confront sample issues. Indeed, return rates on such questionnaires are low. Posting survey invitations on social networks, discussion groups, and chat rooms is typically unpleasant or disrespectful. Many individuals consider this form of posting as "spam" and the researcher may be flooded with emails from disgruntled members of a virtual community. Finally, the

disadvantage of electronic questionnaires is that any doubts the respondents might have cannot be clarified.

Since the benefits of electronic and online questionnaires exceed the drawbacks, electronic and online questionnaires have been chosen as the distribution method for this study in gaining data from the respondents in Malaysia.

Step 2: Clarifying Concepts

Once the previous step has been taken, a list of the questionnaire items was designed. In this part, it is crucial to examine the questionnaire list that provides the information that answers the research questions. Therefore, the researcher needs to identify whether the respondents can understand the list of questions to answer the questions.

Constructing the content, structure, and appearance of a questionnaire is an important part of this step. The content or concept of the study was clearly defined by clarifying the method of measurement used for the study. In other words, the questions that are related and relevant to the research objectives were included. Table 3.3 presents the summary of the listed questions in the questionnaire. Furthermore, the structure of the questions was arranged well, such as the wording used in the study, the sequence of the questions and the general layout of the questions. The purpose of this step is to reduce errors made by the respondents when answering the questionnaires.

Table 3.3: Summary of the Listed Questions in the Questionnaire

No	Variables	Questions	References
1	Political trust	1. In personal, to what extent do you trust the government? 2. How much do you personally trust politicians? 3. How much do you personally trust political parties? 4. How much do you personally trust the parliament? 5. Do you trust the government that made the decision to introduce the carbon tax?	Adapted from Jagers et al. (2010). Adapted from Davidovic and Harring (2019) and Fairbrother et al. (2019). Adapted from Kim et al. (2013).
2	Government's integrity	1. The government intends to act in the best interest of the public. 2. The government intends to act fairly. 3. The government is open and honest with the public, even if it is not in their favor. 4. The government avoids being overly influenced by interest groups.	Adapted from Kitt et al. (2021).
3	Government's competence	1. The government is doing a good job with regards to climate change. 2. The government is competent enough to deal with climate change. 3. The government has the necessary skilled people to carry out its job with regards to climate change.	Adapted from Kitt et al. (2021) and Poortinga and Pidgeon (2003).
4	Government's accountability	1. In general, do you trust the government in spending the national revenue collection? 2. Do you trust that the government uses the revenue from carbon taxes in a good way? 3. How much do you trust the government in spending the revenue in improving public welfare?	Adapted from Kallbekken and Sæælen (2011). Adapted from Kallbekken and Aasen, (2010). Self-construct.
5	Public acceptance of the carbon tax	1. Do you support this government decision to implement carbon tax? 2. To what extent do you support the implementation of the carbon tax policy? 3. Are you willing to accept this government's decision to implement carbon tax?	Adapted from Kim et al. (2013).

To ensure a thorough design of the research, the operational definition was used to measure the concepts and variables used in this study. Each variable will have a specific definition based on the suitability of the study and objectives. Table 3.4

presents the operational definitions for the independent variables and dependent variable used in this study.

Table 3.4: Operational Definitions for the Independent and Dependent Variable

	Variables	Operational Definitions
Independent variable	Political trust	Public trust towards the government and its components (political parties, politicians).
	Government's integrity	Public's personal perception that the government is fair, open, honest, and acts in the public's best interest.
	Government's competence	Public's personal perception in the government that they are skilled and experienced enough to deal with climate change.
	Government's accountability	Public's perception on the government in managing the revenue spending.
Dependent variable	Public acceptance of the carbon tax	Public acceptance of the carbon tax implementation in Malaysia.

Step 3: Determining Question Types, Format and Sequence

In information collection, the designation of a questionnaire set is crucial since it influences the perceptions of the respondents when answering questions. Several controls were included in the pre-test of the questionnaire set in order to reduce method bias. According to Kock et al. (2021), it is crucial to take procedure control in the survey design in order to combat several biases.

For this study, closed-ended questions were used in constructing the series of questions. The sequence of questions is divided into two sections namely Section 1 and Section 2. Section 1 provides questions that directly specify the topic of the study, and subsequently address the research objectives. This section consists of 18 questions related to the variables of the study: political trust, government's integrity, competence, accountability, and public acceptance of carbon tax.

Procedure control of common method bias was performed by designing the survey with rigour and specific controls. Firstly, Section 1 uses the different levels of the Likert scale ranging from 1 to 5, such as 1 (Strongly Distrust) to 5 (Strongly Trust), 1 (Strongly Disagree) to 5 (Strongly Agree), 1 (Strongly Not Confident) to 5 (Strongly Confident), 1 (Strongly Not Support) to 5 (Strongly Support), and 1 (Strongly Not Accept) to 5 (Strongly Accept). Secondly, the controls setting of designing the questionnaire using Google Form was taken into this step by designing the questions in the form of multiple choices design instead of linear scale design. This is to prevent the respondents from randomly answering the questions without understanding each question and to tackle the common method bias. Other than that, this study made a few modifications in the Google Form to ensure that the participants answer all of the questions.

In Section 2, the demographic questions were constructed to understand the respondents' general information regarding their age, education, employment status, monthly gross income, gender, race, and location.

The questionnaire was originally written in English, but it was translated into Bahasa Melayu to ensure that the respondents have a better understanding of the questions. According to Behr (2018), translating the questionnaire is crucial to increase the number of respondents and to ensure that they understand the questions completely.

In addition, the participants were informed of the duration of the study so that they may prepare their time accordingly. It took approximately 5 to 7 minutes to complete the survey. Furthermore, the questionnaire explicitly mentions that there are no correct answers and that all the responses would be kept anonymous. In order to protect the participants' privacy, this study did not gather their email addresses. This

instruction is stated in the questionnaire design in order to increase the motivation of the respondents to answer the online survey. As a result, a reminder was sent to the participants a month after the Google Form link was sent to them.

Step 4: Pre-testing the Questionnaire

When the questionnaire set was constructed, the expert reviewer reviewed the questionnaire to identify the words, format, and sequence of the questionnaire. Table 3.5 demonstrates that two reviewers with an academic background in the quantitative study conducted a pre-test of the questionnaire in order to identify the weaknesses of the questionnaire and ensure that the set of questions can be understood by the potential respondents. The comments from the reviewers on the sequence of the questionnaire and rewording of the sentence in the questions were applied. The questionnaire was revised following the reviewers' comments (Appendix 1).

Table 3.5: List of Reviewers

No.	Reviewers	Positions and Organisations
1.	Dr Salwa Hana Yussof	Assistant Professor, International Islamic University Malaysia.
2.	Assoc. Prof. Dr Syadiyah Abdul Shukor	Associate Professor, Universiti Sains Islam Malaysia

Step 5: Pilot Testing the Questionnaire

A new set of questionnaires was constructed after making some revisions (Appendix 2). Then the pilot study was conducted in May 2021 among 50 respondents using an online survey. However, only 35 of the respondents answered the online survey. According to Browne (1995), the sample size of 30 is considered sufficient to conduct a pilot study. After the data for the pilot study was collected, the validity and

reliability analyses were conducted to identify the data structure in the questionnaire design and its consistency.

Step 6: Administrating the Questionnaire

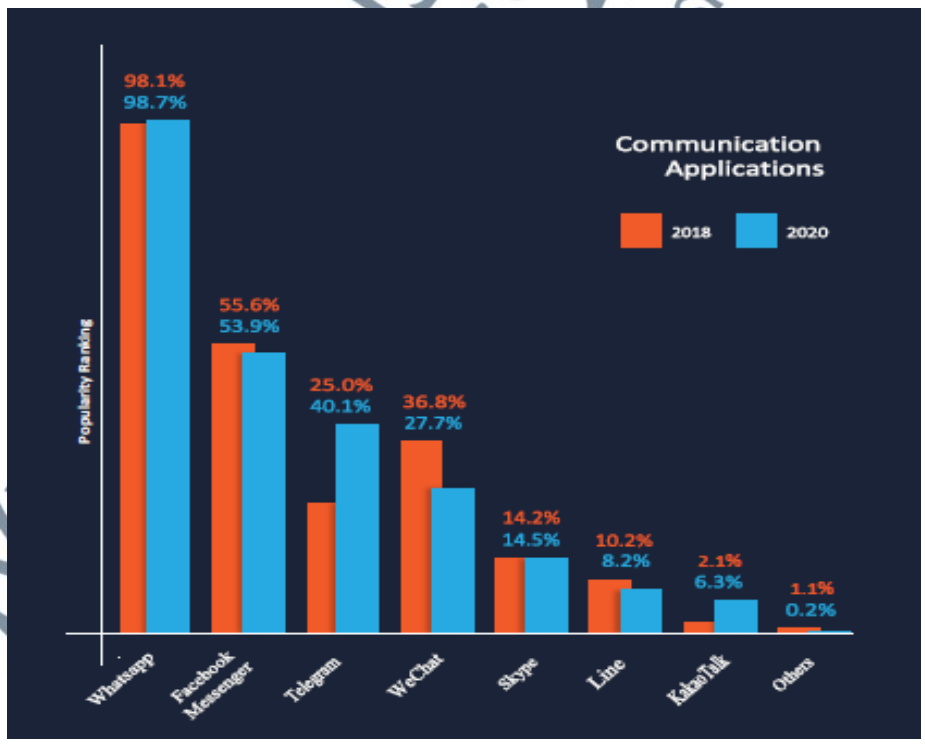
When the questionnaire has been adequately designed, the method of distribution for the actual study can be conducted. For this study, the questionnaires were distributed by using an online questionnaire. The reason for using this method of distribution is because Malaysia is in the midst of fighting the COVID-19 pandemic. Malaysia also underwent the movement control order in early March 2020 to curb the spread of COVID-19 (Fan & Cheong, 2021). Therefore, conducting a paper-based survey could be dangerous because it can increase the spread of the disease.

Conducting online surveys help the researcher to collect the data very fast. Currently, Malaysia has become one of the countries with the highest rate of internet and phone users (Malaysian Commission and Multimedia Communications, 2020). Figures 3.3, 3.4 and 3.5 below show the statistics of smartphone users, communication application users, and social media users in Malaysia. Therefore, the Google Form link was distributed through communication applications such as WhatsApp, Facebook Messenger and Telegram, while on social media, it was distributed through Facebook and Instagram. Furthermore, by using the Google Form, the researcher can ensure that the respondents would answer all the questions and reduce the minimal error of the study.

Device to Access Internet	2014	2016	2018	2020
Smartphone	74.3	89.4	93.1	98.7
Netbook / notebook / laptop	51.4	36.3	44.2	37.9
PC / desktop	35.3	29.3	28.1	16.2
Tablet	25.5	18.0	20.4	6.4
Smart TV	1.9	6.7	12.3	5.9
Feature phone	12.5	9.4	8.6	1.3
TV streaming box	-	5.6	7.6	2.9
Game console	1.2	2.5	4.7	0.8
Smartwatch	-	-	2.4	0.6

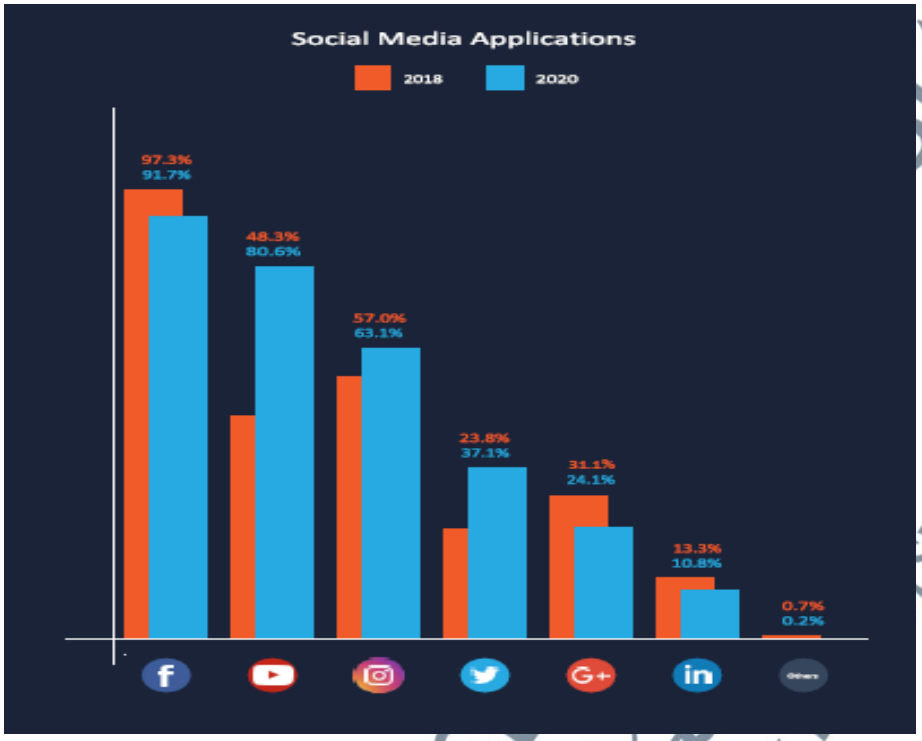
Source: Malaysian Commission and Multimedia Communications (2020)

Figure 3.3: Types of Devices Used to Access the Internet



Source: Malaysian Commission and Multimedia Communications (2020)

Figure 3.4: Statistics of Communication Application Users



Source: Malaysian Commission and Multimedia Communications (2020)

Figure 3.5: Statistics of Social Media Application Users

3.6 Data Analysis Method

Data analysis is the most integral part of the research process that uses applied statistical tools to analyze the data collected in answering the research questions. This process will help in ensuring the quality of the data and interpreting it into meaningful results. This study used SPSS version 26 to analyze the data. SPSS is one of the most popular software used among researchers because it can perform complex data manipulation and analysis with simple instruction. The features and function of the SPSS help researchers in analyzing the data and understanding the result of the study.

This section discusses the data analysis procedures taken to determine the completeness and adequacy of the data for further analysis. The discussion focuses on the pre-test analysis for the survey and data analysis procedures performed on the

items to answer the research questions. The procedures for the pre-test analysis for the survey include a check for missing data, normality test, response rate, non-response bias and common method bias, as discussed in this section. The next sub-sections explain the main data analysis procedure according to the research questions. In this part, five types of data analysis were conducted namely demographic analysis, descriptive analysis, validity analysis, reliability analysis and multiple regression analysis.

3.6.1 Pre-test Analysis for Survey

3.6.1.1 Missing Data

Missing value analysis was performed using the missing data analysis function in SPSS Statistics. It is important to verify the validity and completeness of the data that has been collected before conducting any analysis. The validity of the findings can be jeopardised by missing data, which must be discovered and resolved. Data collection and data entry errors are the most common causes of missing data. However, if the missing data is more than 15% of the total responses, the missing data can be removed (Hair et al., 2020). The majority of recent researches had used online surveys to collect primary data. Controls are included in online surveys that prevent the respondents from moving on to the next question if they have not answered a specific question. Online surveys that use these controls have no missing data.

3.6.1.2 Normality Test

Assessment of normality data is crucial before any statistical test because normal data is an underlying assumption in parametric testing (Mishra et al., 2019). In assessing the normality of data, two main methods are used namely the graphical and

numerical tests. Statistical test has the advantage of providing an objective evaluation of normality. Although this test has some disadvantages, the most significant one is that it is not sensitive enough with small sample sizes or overly sensitive with large sample sizes. On the other hand, the advantage of graphical interpretation is that it allows for good judgement to be used to assess normality when numerical tests may be too sensitive or under sensitive.

There are various methods available to test the normality of continuous data, such as the Shapiro-Wilk test, Kolmogorov-Smirnov test, skewness, kurtosis, histogram, box-plot, P-P (probability-probability) plot, Q-Q plot and mean with Standard Deviation (Mishra et al., 2019). For this study, the normality test was determined by using the graphical method, which is the normal P-P Plot because of the large sample size used in this study. It is possible to determine how closely two data sets (observed and predicted) agree using a P-P plot (probability-probability plot). When the data is normally distributed, an approximately straight line is formed. A deviation from this straight line indicates a departure from normality (Mishra et al., 2019; Pallant, 2010).

3.6.1.3 Non-response Bias

A non-response bias test was conducted in this study to ensure that the sample was not biased. Using a survey as an instrument to collect data is a challenge because a high non-response rate can result in bias in responses. This is due to failure to contact respondents, the inability of respondents to complete a questionnaire, or their refusal to participate (Bryman & Bell, 2011). Benke and Street (1992) highlight that the popular approach to prove non-response bias is by comparing early responses to later responses or first responses to responses generated after follow-ups. If there are

no significant differences between the two groups of responses, it can be assumed that there is no problem of non-response bias. The t-test analysis was used to compare responses generated before the reminders were sent (early responses) with responses generated after the reminders were sent (late responses) to determine whether there was any non-response bias in the samples.

3.6.1.4 Response Rate

Response rates are commonly used to measure data quality, and low response rates could result in non-response bias. Consequently, response rates are an essential measure in conducting a research and low response rates may affect the validity of estimates, analyses, and inferences in a research. Response rates are computed by dividing the number of usable responses returned by the total number of eligible participants in the selected sample. This calculation only shows how effective the questionnaire is in reaching the respondents to fill out the survey, and it hides a possible bias in the instrument's large sample selection (Fincham, 2008).

The participants were invited to participate in the study using Google Form. The Google Form was distributed via WhatsApp, Facebook, and Instagram to reach as many people as possible. The online survey is used in this study because it is possible to increase the sample size and, most importantly, because there are no significant additional costs (Deutskens et al., 2004). The response rate increased significantly as a result of a more personalised survey invitation and frequent reminders. In terms of survey response rates, sending out reminders was found to be another important factor (Saleh & Bista, 2017). In this study, the participants received a reminder one month after the initial distribution of the survey.

3.6.1.5 Common Method Bias

Common method bias is the systematic error variance that results from using a common method to measure the construct of the study (Podsakoff et al., 2003). It appears in survey responses when the respondents' responses to the independent and dependent variables are correlated (Hair et al., 2020). Data from questionnaire surveys can be tested for common methods bias on a post-hoc basis using Harman's single factor method (Hair et al., 2020; Podsakoff et al., 2003). The Harman's single factor (also known as the one factor) test is the most widely used technique for detecting common method bias (Fuller et al., 2016). This test uses exploratory or confirmatory factor analysis to identify common method bias.

3.6.2 Demographic Analysis

Demographic analysis was conducted in this study to understand the respondents' demographic characteristics (Sekaran & Bougie, 2016). For this study, the demographic section seeks information regarding the respondents' age, education level, employment status, monthly gross income, gender, race and location (Table 3.6).

Table 3.6: Demographic Information

Categories	Description
Age	18-20 years old 21-39 years old 40-49 years old 50-59 years old 60-69 years old
Education level	No schooling completed Primary school High school Matriculation/ Pre-Diploma/ Certificated STPM/ Diploma Professional Certificate Bachelor's degree Master's degree

	Doctor of Philosophy
Employment status	Full-time employed Part-time employed Self-employed Student Retired Not employed
Monthly gross income	Less than RM1,200 RM1,201 – RM3,000 RM3,001 – RM6,000 RM6,001 – RM9,000 RM9,001 – RM12,000 RM12,001 or more
Gender	Male Female
Race	Malay Chinese Indian Iban Others
Location	Johor Kedah Kelantan Melaka Negeri Sembilan Pahang Perak Perlis Pulau Pinang Sabah Sarawak Selangor Terengganu Wilayah Persekutuan Kuala Lumpur Wilayah Persekutuan Labuan Wilayah Persekutuan Putrajaya

3.6.3 Descriptive Analysis

Descriptive analysis refers to the summary of analysis data that measures the central tendency of data derived from a sample or population. It describes the data in terms of mean, median, variance and standard deviation.

This study used descriptive analysis to describe the analysis for each independent variable and dependent variable. Therefore, the mean, variance and standard deviation of the variables are analysed to identify the quality of the data.

The means or average of the data measures the central tendency of the data, which gives a general picture of the data, whereas variance measures the variability. Variance explains how the data is spread from the mean. The standard deviation measures the dispersion for interval and ratio scales (Sekaran & Bougie, 2016). It also explains the average distance between each quantity and the mean. This means that the higher the standard deviation, the wider it spreads out from the mean (Sharma, 2019).

3.6.4 Validity Analysis

Validity analysis or known as factor analysis is a method for identifying "unobserved" factors. In this study, exploratory factor analysis (EFA) was conducted to understand the possible underlying structure in the variables (Zhang & Xiang, 2019). This means that EFA can verify whether the variables meet the theorized dimension (Sekaran & Bougie, 2016).

Two statistical measures were used in this study to identify the validity of the data, which are Bartlett's test of Sphericity and Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO). According to Tabachnick and Fidell (2007), the value for Bartlett's test of Sphericity is considered to be significant when$p<0.05$. Meanwhile, the minimum value for KMO should be 0.60 for it to be deemed as a good factor analysis. Furthermore, for factor loading to be regarded as significant, the value should be more than 0.40; otherwise, it shall not be included if it is lower than this value (Hair et al., 2010).

3.6.5 Reliability Analysis

Reliability analysis refers to the testing of an instrument to measure its consistency and stability (Sekaran & Bougie, 2016). In this study, the instrument is regarding the survey questionnaire (Tavakol & Dennick, 2011). Reliability is intended to test the consistency of the items in the questionnaire i.e. whether it can attain the same result repeatedly to consider it reliable (Koonce & Kelly, 2014). Reliability and validity are closely related because the instrument cannot be regarded as valid unless it is reliable. Therefore, most previous studies used Cronbach's alpha to test the consistency of the instrument and whether or not the score is reliable (Tavakol & Dennick, 2011). The result from the test should be a number from 0 to 1. Based on the general rule of thumb, the closer the Cronbach's alpha to 1, the greater the internal consistency of the items in the scale. Table 3.7 presents the Cronbach's alpha values (Hair et al., 2010):

Table 3.7: The Range of Values for Cronbach's Alpha

Alpha Coefficient	Strength of Internal Consistency
< 0.6	Poor
0.6 to < 0.7	Moderate
0.7 to < 0.8	Good
0.8 to < 0.9	Very good
0.9	Excellent

Source: Hair et al. (2010)

3.6.6 Multiple Regression Analysis

Multiple regression is one of the fussier statistical techniques. Thus, prior to conducting the multiple regression analysis, preliminary analyses such as linearity, homoscedasticity, and multicollinearity must be performed (Pallant, 2010).

Linearity examines the relationship between the two variables that should show a straight line. The scatterplots involve checking the linearity of the data, which means that the outcome should have a straight-line relationship with the scores of the dependent variables (Pallant, 2010).

Furthermore, homoscedasticity should show a fairly even cigar shape along its length (Pallant, 2010). The variance of the residuals about the predicted dependent variables' scores should be the same for all the predicted scores. To confirm the homoscedasticity of the data, the dots in the scatterplot need to be evenly scattered throughout the table with a majority of them located in the centre and with the range of standardised residual values between 3.0 and – 3.0.

Multicollinearity refers to the relationship among the independent variables (Pallant, 2010). Tolerance and the variance inflation factor (VIF) measurements are utilised to assess the results of the test. Pallant (2010) found that multicollinearity occurs when the tolerance value is less than 0.10 and the VIF value is greater than 10.

After conducting the preliminary analysis, multiple regression analyses were performed. Regression analysis is one of the statistical techniques used for estimating the relationship between variables. Simple regression analysis identifies the relationship between a single independent variable and a dependent variable (Sekaran & Bougie, 2016). The regression model that analyses the relationship between several independent variables and dependent variables is called multiple regression analysis (Hair et al., 2010). Multiple regression analysis was used to identify the relationship between several independent variables and dependent variable.

This study aims to examine how trust in the government influences public acceptance of carbon tax implementation in Malaysia. According to Sekaran and Bougie (2016), the dummy variable should be conducted to represent an attribute with

two or more distinct levels. Therefore, the variables of political trust, government's integrity, government's competence and government's accountability were tested and recorded into the dummy variables ranging from 1 to 5 (strongly disagree to strongly agree). Hence, the model of this analysis is formulated as follows:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \varepsilon$$

y = Public acceptance of the carbon tax

x_1 = Political trust

x_2 = Government's integrity

x_3 = Government's competence

x_4 = Government's accountability

ε = error term

This analysis is conducted to determine the power of the relation. In multiple regression analysis, power refers to the probability of detecting a significant and specific level of R^2 or regression coefficient (Hair et al., 2010). By using the SPSS, R^2 can be found in the Model Summary of variables. To identify the significant value of R^2, the data is presented in ANOVA, which explains the main effects of the independent variables on the dependent variable. For regression analysis, it is important to determine the value of beta, t-value and p-value. The positive value of beta will show the influence of the independent variable on the dependent variable while the p-value is $p<0.05$ (Pallant, 2010; Tabachnick & Fidell, 2007). By conducting the analysis, it helps to identify the influence of public acceptance on the carbon tax implementation in Malaysia. The Summary of Data Analysis Method is presented in Figure 3.6 below:

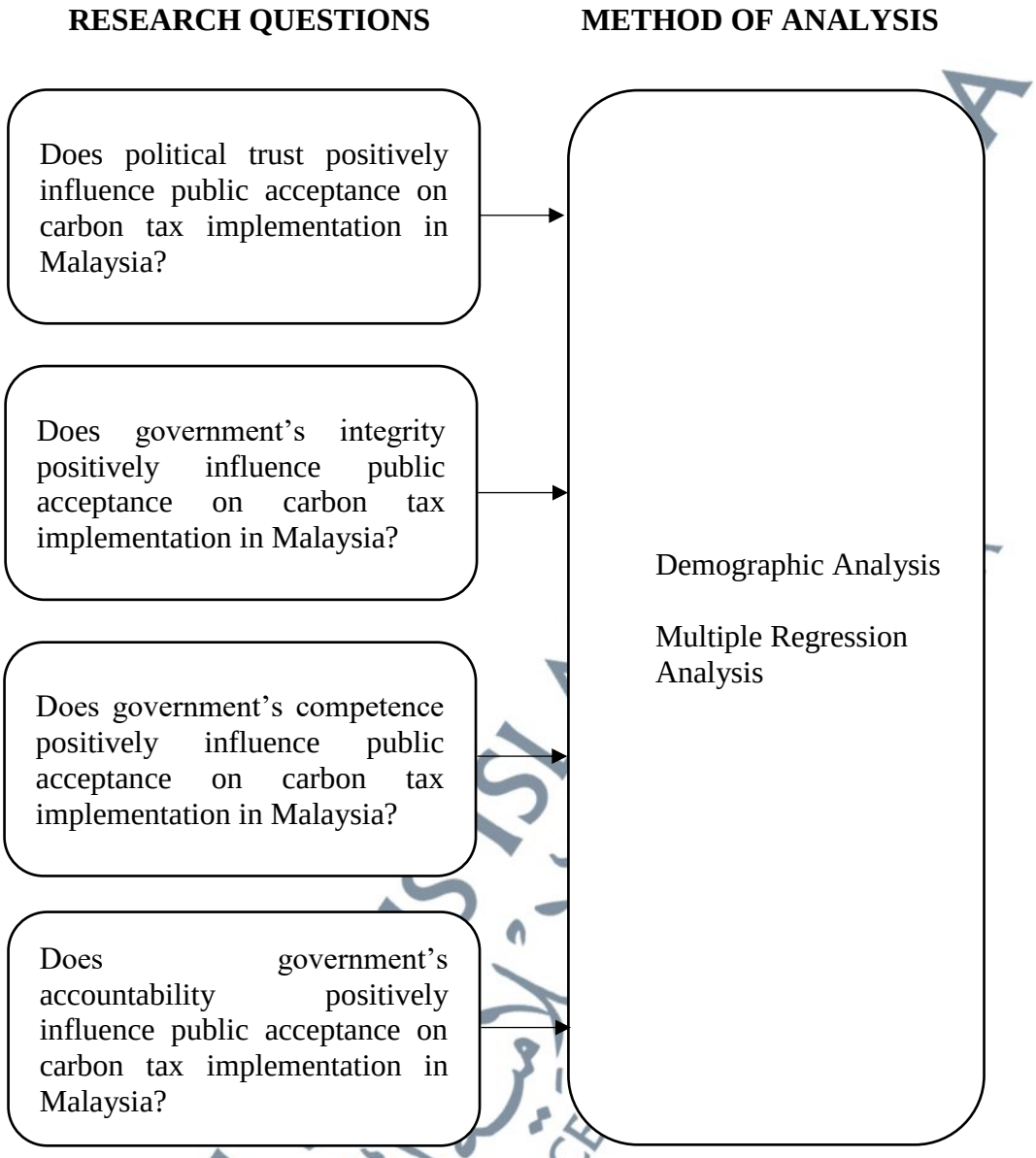


Figure 3.6: Summary of Data Analysis Method

3.7 Pilot Study

A pilot study or feasibility study is one of the research procedures where a trial run is conducted to test the gathered information (Teijlingen & Hundley, 2002). Feasibility study can help improve the quality and efficiency of a questionnaire, which can give an early warning about the failure of a larger research project. Running a feasibility study allows researchers to identify the reasons for failure, such as research

protocols that may not be followed or proposed methods or questionnaire designs that are inappropriate or too complicated. Moreover, content validity and construct validity are conducted to validate the questionnaire, followed by a reliability analysis to measure the consistency of the survey results.

As this study was conducted among Malaysian citizens, the online questionnaire was distributed to 50 people using Google Forms via the online application WhatsApp. The Google Form link was sent to all the WhatsApp groups and a list of contacts, where the respondents could directly click on the link to answer the questionnaires. A total of only 35 respondents completely answered the online survey. According to Browne (1995), a sample size for a pilot study should be between 15 to 30 respondents. Therefore, a total of 35 respondents was considered acceptable.

After conducting the pilot study, it was found that the structure of the questionnaires needs to be revised by following the suggestions from the experts. For the construct validity and reliability of the questionnaires, they were found to be reliable and validated. Thus, no further changes were made and the study proceeded with the questionnaire distribution for the actual study.

3.7.1 Validity

The questionnaire's validity can be assessed by examining whether it is able to measure what it is meant to measure (Tsang et al., 2017). Therefore, two major types of validity tests should be considered when validating a questionnaire namely content validity and construct validity.

3.7.1.1 Content Validity

Content validity is determined by having a panel of experts familiar with the questionnaire design to examine the set of questionnaires. This is performed to see whether the questionnaire items adequately measure the construct being assessed and if the items are sufficient to evaluate the study's domain of interest (Tsang et al., 2017). For this study, the questionnaires were administered to two reviewers with academic backgrounds for evaluation. The reviewers provided the suggestion that the questionnaire should begin by clearly explaining the concept of carbon tax in order to increase public engagement and participation in the survey. Additionally, the reviewers suggested rearranging the questions and rephrasing the sentences. The questionnaire was then revised in accordance to the reviewers' recommendations.

3.7.1.2 Construct Validity

Construct validity is performed to measure a construct that is not directly observable (Tsang et al., 2017). For this study, to analyze the construct validity of the data, the Bartlett's test of Sphericity and KMO were used (Tabachnick & Fidell, 2007). The validity analysis shows that the Bartlett's test of Sphericity is significant ($p<0.05$). The value of KMO is above the minimum value of 0.60, which means that all the items are suitable for the study and represent the study's variables. Table 3.8 presents the summary of the KMO value that represents the validity analysis of the pilot study.

Table 3.8: Results of Validity Analysis in Pilot Study

Variables	Number of Items	KMO value
Political trust	5	0.839
Government's integrity	4	0.753
Government's competence	3	0.725
Government's accountability	3	0.665
Public acceptance of carbon tax	3	0.733

3.7.2 Reliability

Reliability analysis is conducted to determine the consistency of the items. The analysis of the reliability test is conducted by examining the value of Cronbach's Alpha. A Cronbach's Alpha value close to 1.0 is considered appropriate, whereas a Cronbach's Alpha value lower than 0.60 is deemed to be inappropriate. The result of the pilot study for reliability analysis shows appropriate value for each variable. Table 3.9 presents the Cronbach's Alpha value for each variable.

Table 3.9: Cronbach's Alpha Values for the Independent and Dependent Variables

Variables	Number of Items	Cronbach's Alpha
Political trust	5	0.908
Government's integrity	4	0.799
Government's competence	3	0.905
Government's accountability	3	0.850
Public acceptance of the carbon tax	3	0.930

As a result, the findings of the pilot test and reliability analysis in the pilot study demonstrated that the questionnaire is reliable and relevant enough to be used in the final survey. The research methodology for this study is illustrated in Figure 3.7.

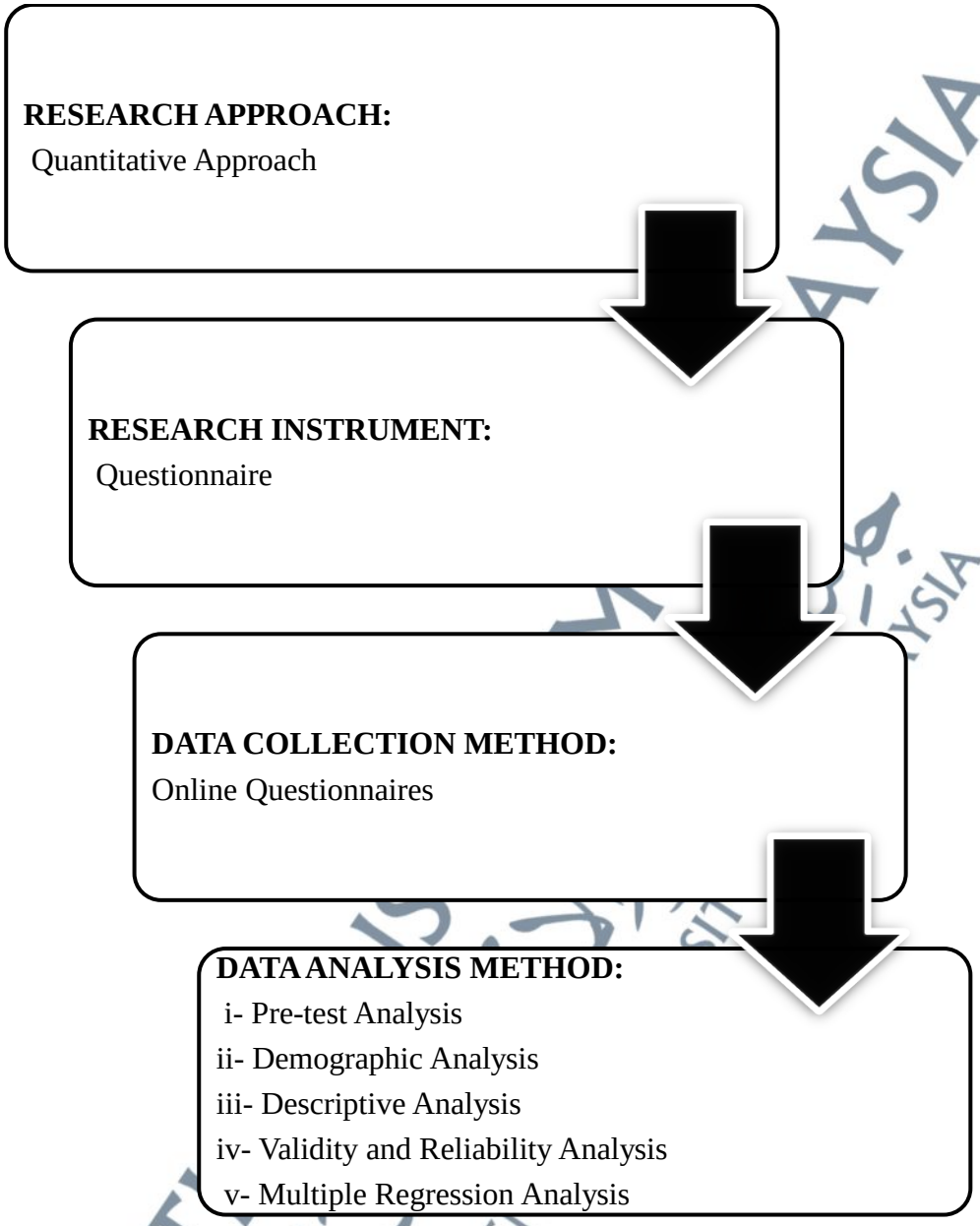


Figure 3.7: Flowchart of the Research Methodology

3.8 Conclusion

This chapter explained the research methodology adopted for this study. The researcher adopted the quantitative approach and used a questionnaire as the research instrument in order to meet the objectives and find the answers to the research questions of the study. The questionnaire was distributed using online survey to Malaysia residents.

In the section on sampling design, the researcher discussed the target population, sampling frame and sampling location, sampling elements, sampling technique, and sampling size used for the survey in this study. The target population of this study is the Malaysia citizen that currently living in Peninsular Malaysia, Wilayah Persekutuan Labuan, Sabah and Sarawak with age more than 18 years old. The total population (N) for this study is 21.1 billion. The researcher used the area sampling method to collect the data.

Finally, Statistical Package for Social Sciences (SPSS) version 26 was used to analyse the data. The SPSS software consists of several different features and functions that could be useful for statistical data analysis. Three tests were chosen, which are demographic analysis, descriptive analysis, and multiple regression analysis. Pilot study was conduct in this chapter to validate the questionnaire by assessing the content and construst validity followed by reliability analysis to determine the consistency of the survey data.