



THE RUBBISH BIN USING PLASTIC BOTTLE RECYCLE

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DIPLOMA IN BUSINESS STUDY DEPARTMENT

SESSION: 2 2022/2023

POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH

RECYCLING PLASTIC BOTTLES CHANGE TO RUBBISH BIN

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A project report submitted in partial fulfilment of the requirement for the award of
Diploma in Business Studies.

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We declare that the work in this final year project paper was carried out in accordance with the regulation of Polytechnic. It is original and is the result of our own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any diploma or qualification.

We, hereby, acknowledge that we have been supplied with the Academic Rules and Regulations for Undergraduate, Polytechnic, regulating the conduct of my study and research.

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ABSTRACT

In today's environment, concerns about environmental pollution are increasing because of material processes or products that are not environmentally friendly. PET bottles (Polyethylene terephthalate) help the main composition in solid waste, and they are thrown away after use. Plastic recycling methods are usually a way of returning natural resources to nature to ensure its sustainability. The cause of the pollution that occurs due to the toxic waste produced by plastic has affected the environment in a way that affects life on earth. This pollution has been widely proven in research that it has greatly affected the earth covering the world in a dangerous way with all major firms involved with the use of plastic in their packaging and production processes. Recycling is a technical method in helping to restore nature by turning it into another useful product. The study will focus on primary and secondary recycling, where plastics will be reused and will not turn to chemicals or fuels to meet energy needs. The difference between primary recycling is known as closed-loop recycling, which is the process of turning one thing into many things that are still the same. While secondary recycling is changing something into something else but not made of the same material.

KEYWORDS: *Plastic bottles, Dustbin, Recycle, Environment*

ABSTRAK

Dalam persekitaran hari ini, kebimbangan terhadap pencemaran alam sekitar semakin bertambah akibat dari proses bahan atau produk yang tidak mesra alam. Botol PET (Polietilena tereftalat) membantu komposisi utama dalam sisa pepejal dan ia dibuang selepas digunakan. Kaedah kitar semula plastik biasanya merupakan cara sumber semulajadi tersebut dikembalikan kepada alam semula jadi untuk memastikan kemampuannya. Punca dari pencemaran terjadi akibat sisa toksik yang dihasilkan oleh plastik telah menjejaskan alam sekitar dengan cara yang menyedihkan bagi hidupan bumi. Pencemaran ini telah banyak dibuktikan dalam penyelidikan bahawa ia telah banyak menjejaskan bumi yang merangkumi seluruh dunia dengan cara berbahaya bersama semua firma utama yang terlibat bagi penggunaan plastik dalam proses pembungkusan dan pengeluaran mereka. Kitar semula adalah kaedah teknikal dalam membantu memulihkan alam semula jadi dengan menjadikan ia sebagai produk lain yang berguna. Kajian ini akan memberi tumpuan kepada kitar semula primer dan sekunder, dimana plastik akan digunakan semula dan tidak akan bertukar kepada bahan kimia atau bahan api untuk memenuhi keperluan tenaga. Perbezaan kitar semula primer ialah ia dikenali sebagai kitar semula gelung tertutup, iaitu proses menukar satu benda kepada pelbagai perkara yang masih sama. Manakala kitar semula sekunder adalah menukar sesuatu benda kepada benda yang lain tetapi diperbuat daripada bahan yang sama.

KATA KUNCI: Botol plastik, Tong Sampah, Kitar Semula, Alam Sekitar

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

The description of the study background, problem statement, objective, scope, significance, operation definition and SWOT analysis would make up the whole of this chapter. The rubbish bin using plastic bottle recycle as a rubbish bin that made from recycle material and how it will be implemented in accordance with the course requirements.

1.2 BACKGROUND OF STUDY

Concerns about our lifestyles and our careless garbage disposal have grown as environmental awareness has increased. Over the past ten years, we have made an active effort to tackle this complex issue. Our attempts in the United States to address the problem of solid wastes, particularly plastic wastes, are briefly discussed here. These efforts are starting to yield encouraging outcomes. The yearly production of municipal solid waste (MSW) has started to fall, for example, from 211.5 million tonnes in 1995 to 209.7 million tonnes in 1996. Composting and recycling rates are rising. There is a decline in waste disposal (from 60.9 to 55.5% in 1996). Additionally growing is waste disposal by combustion. This is mainly because the new incinerators are more efficient and their capacity to eliminate hazardous gases and particles. Plastics make up a very minor but important portion of the waste stream. The fact that more plastics are being recycled than ever before is good. High density polyethylene (HDPE) bottles and polyethylene terephthalate (PET) bottles both received roughly 317 million kg and 294 million kg of recycling in 1997, respectively. It is being investigated to recycle durable products including carpets, electronics, and appliance housings and parts. When creating new parts, environmental compatibility and recycleability are taken into account. Additionally being researched as instruments for decision-making are life cycle analyses and management(Subramanian, 2000).

Plastics have become an integral part of our lives. The amounts of plastics consumed annually have been growing steadily. Its low density, strength, user-friendly design and fabrication capabilities and low cost, are the drivers to such growth. Besides its wide use in packaging,

automotive and industrial applications, they are extensively used in medical delivery systems, artificial implants and other healthcare applications, water desalination and removal of bacteria etc. Usage of plastics, in preservation and distribution of food, housing and appliances are too many to mention here. Specially designed plastics have been an integral part of the communication and electronics industry be it in the manufacturing of chips or printed circuit boards, or housings for computers. The waste plastics collected from the solid wastes stream is a contaminated, assorted mixture of a variety of plastics. This makes their identification, separation, and purification, very challenging. In the plastics waste stream, polyethylene forms the largest fraction, which is followed by PET(Subramanian, 2000).

1.3 PROBLEM STATEMENT

❖ Current Issue / Symptom

Economic development and people's changing patterns of consumption and production have led to a drastic increase in plastic wastes all over the world. Plastic waste disposal harms the environment and poses threat to human health. Hence, there is great desire to reduce the plastic wastes. To reduce plastic wastes, education is of utmost importance as education can change people's knowledge, attitude, and behaviours toward plastic waste management. The rapid urbanization and economic growth in different countries have led to a drastic increase in plastic production and consumption around the globe. Owing to the low recycling value of plastic and the lack of technological support, the recovery rate of plastic waste remains very low. Most of it is washed into the ocean, disposed of in landfills, or burned in incinerators. These enormous amounts of plastic waste bring disastrous consequences, such as pollution, food chain contamination, biodiversity breakdowns, energy waste, and economic loss(Chow et al., 2017).

A few lives cycle assessment (LCA) studies have been undertaken within the last 15 years comparing end-of-life treatment options for post-consumer plastic waste, including techniques such as: mechanical recycling, feedstock recycling, incineration with energy recovery and landfilling. These have attempted to support decisions in the formulation of waste management strategies and policies. Considering the introduction of life cycle thinking into European waste policies, specifically in relation to the waste hierarchy, a literature review of publicly available LCA studies evaluating alternative end-of-life treatment options for plastic waste has been conducted. This has been done to establish if a consensus exists as to the environmentally preferable treatment option for plastic waste; identify the methodological considerations and assumptions that have led to these conclusions; and determine the legitimacy of applying the waste

hierarchy to the plastic waste stream. The majority of the LCA studies concluded that, when single polymer plastic waste fractions with little organic contamination are recycled and replace virgin plastic at a ratio of close to 1:1, recycling is generally the environmentally preferred treatment option when compared to municipal solid waste incineration. It has been found that assumptions relating to the virgin material substitution ratio and level of organic contamination can have a significant influence upon the results of these studies. Although a limited number of studies addressed feedstock recycling, feedstock recycling and the use of plastic waste as a solid recovered fuel in cement kilns were preferred to municipal solid waste incineration. Landfilling of plastic waste compared to municipal solid waste incineration proved to be the least preferred option for all impact categories except for global warming potential. Due to the uncertainty surrounding some assumptions in the studies, it cannot be said with confidence that the waste hierarchy should be applied to plastic waste management generally (Lazarevic et al., 2010).

❖ Specific Problem

Plastics wastes are flows into the recycle or landfill or incinerators in the official waste management. The problems related to plastic production, the use and disposal summarized into three areas. The first is the emissions of 400 million tons of greenhouse gas per year. Recycling plastics are economical less attractive due to the challenge of high cost of intensive sorting, market price fluctuations and the mixed nature of local waste plastic. (Tesfaye & Kitaw, 2021). Globally, 389 billion of PET bottles had been produced in 2010, 46% of them for water packaging (ELIPSO, 2012). But this stability leads PET to be highly resistant to environmental biodegradation. Biodegradation of one PET bottles left in nature can last around 500 years. Thus, this causes many and varied environmental concerns for both terrestrial and marine areas. Its accumulation is particularly impressive in the world's oceans, where about 10% of global plastic production amass each year. s very often concerning highly complex topics, the range of possible solutions for protecting the ecosystem of plastic pollution is wide (Orset et al., 2017). Due to the exponential increase of technological development and human population since the industrial revolution, the amount of waste produced has continued to grow. In addition, the environmental issues related to indiscriminate production of various types of waste have become more important than ever. Incineration can be a more cost-effective and viable alternative to landfilling (Nabavi-Pelesaraei et al., 2017).

1.4 OBJECTIVES

This study aimed at the determination of the plastic bottles rubbish bin. These are the main objectives of the research: -

- i. To develop a rubbish bin used from plastic bottles to reduce plastic wastage.*
- ii. To identify public acceptance in recycling made from plastic bottle.*

1.5 RESEARCH QUESTIONS

- i. How to create a rubbish bin that made from plastic bottle recycle?
- ii. What customers' acceptance towards rubbish bin that made from plastic bottle recycle?

1.6 SIGNIFICANCE OF THE STUDY

This study will help in making the environment stay clean and greener by applying the recycling properties of materials.

1.7 SWOT Analysis

<p><u>STRENGTHS</u></p> <p>It is made from recycle plastic bottles materials.</p> <p>Unlimited resource plastic bottles.</p> <p>Low cost does not need a big amount of money.</p> <p>Saving energy</p> <p>Light weight</p> <p>Ease for handling</p>	<p><u>WEAKNESS</u></p> <p>This product can also be damaged, dented and leaking.</p> <p>Alternative item might still be single use and end up as litter.</p> <p>The environment impacts and long-term performance are not understood yet.</p> <p>Difference in grades and types of plastics that may affect the quality of product.</p>
<p><u>OPPORTUNITIES</u></p> <p>It can help to avoid landfills pollution.</p> <p>It can help to make a clean environment.</p> <p>It can help reduce our waste.</p> <p>Availability and sustainability of bio gradable or reusable products could be increased by public</p>	<p><u>THREATS</u></p> <p>There still a risk of harmful chemicals</p> <p>Lack enforcement on anti-littering behaviours.</p> <p>Public have a less concern regarding environment.</p> <p>Difficulty in identifying plastics.</p>

1.8 OPERATIONAL DEFINITIONS

Recycling of used plastic bottles is an important measure to protect the environment and save energy. Usually, bottles in different colours have different value for recycling. Classification of plastic bottles recycling based on image recognition during recycling is an effective way, where the position and colour recognition are the key technologies(Wang et al., 2019).

Historically recycling in the plastic industry was carried out within manufacturing companies as part of the standard production process. In extrusion for instance, often where material and contamination constraints allowed, in-house scrap would be reprocessed with virgin material, to improve final material production yields. Plastic waste both commercial and post-consumer going to landfill. Therefore, it is only relatively late in the development of the plastic industry that focus, and public perception has shifted towards the problems of plastic waste. This has been driven by two factors a growing concern about the costs, both financial and environmentally of land filling, and the sheer amount of plastic waste finding its way into that waste stream(Goodship, 2007).

1.9 SUMMARY

Rubbish bin that are designed and made from recycled materials such as plastic bottles can help in reducing pollution that is harming the environment. It is also one of the ways to protect animals that are likely to die due to uncontrolled plastic pollution. By revealing ideas in material recycling, it can help and educate people to take better care of the environment. Pollution that is currently out of control can be prevented little by little with simple awareness and education. Therefore, we created rubbish bin made from recycled materials, which are plastic bottles as an example that they can be made into reusable materials without having to pollute.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

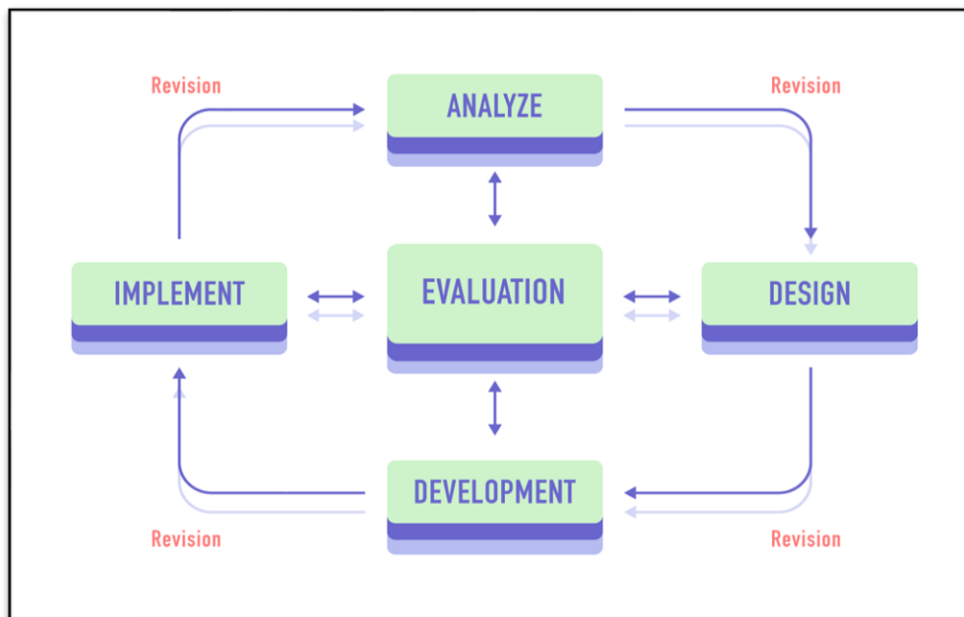
In this chapter, literature review surveys scholarly articles to the topic that is made, which is plastic bottles and recycling and plastic pollution. The research conducted is to identify that the plastic bottles can be reduced in the selected area which is housing area at Subang Jaya. This study will begin by comparing the results of previous studies, the hypothesized relationship between variables, the theoretical model of the study and terms for each variable involved.

2.2 THE PRACTICE OF PLASTIC BOTTLE RECYCLES

Plastic recycling has grown appreciably during the last few years. Recycling of rigid plastic containers has grown to about 1.4 billion pounds — 704 million pounds of waste HDPE bottles and 649 million pounds of waste PET bottles, in 1997. At present, there are more than 1700 businesses handling and reclaiming post-consumer plastics. A wide variety of new products, such as single-use cameras, park benches, sweaters, jeans, videocassettes, detergent bottles and toys are being made with or packaged in post-consumer recycled plastics. More than 1500 commercially available products are listed in the Recycled Plastic Products Source Book published by the APC (Subramanian, 2000).

Furthermore, we contribute to the ecological economics literature on the reduction of pollution and waste on the environment. Contrary to questions about trade-off between regular and organic products in which regulator chooses to support organic products because they are safer for health and their production reduces damages on the environment, the question of plastic bottles packaging is more technical and complex. Indeed, there is no consensus on the plastic which is the most or the least dangerous for the environment, we propose four policies for protecting the environment: an information campaign on the characteristics of each plastic and their consequences on the environment, an organic policy favour-in plastic bottles issued of renewable products, a biodegradable policy favouring biodegradable plastic bottles, and a recycling policy favouring recyclable plastic bottle (Orset et al., 2017).

2.3 THEORETICAL / CONCEPTUAL FRAMEWORK



The method of the research we use is Research and Development (R&D) with the ADDIE Model which consist of 5 stages, namely analysis, design, development implementation and evaluation. ADDIE Model development research is research that can be used to develop learning programs that contain steps of analysis, design, development, implementation, and evaluation(Chow et al., 2017).

So, for the more explanation about our project using the ADDIE Model: -

- ❖ **Analyze:** Monitor & study about environmental towards pollution and find the ways to help reduce and control the problem.
- ❖ **Design:** Creating a sketch of the product layout, content, functionality and includes developing prototypes to help visualize the design.
- ❖ **Develop:** Building the product using materials and should be tested during to ensure that it is functional and user-friendly.
- ❖ **Implementation:** Making the product available to the targeted audience.
- ❖ **Evaluation:** Evaluating the effectiveness of the product and making any necessary changes based on user feedback.

2.4 SUMMARY

In this chapter, it leads to a more precise definitions and notions of effectiveness and efficiency in operations that may cover a wide range of topics. It also presents a discussion in a tested subject. The design of a product plays many important roles in producing a good quality. The first step in the planning sequence is that they create a trash can using plastic bottles which are recyclable materials. The process in the construction of the project to produce this product is very important to us because it is in the interest of our users. So, we must make sure that this product generates and can be of good quality.

CHAPTER 3

METHODOLOGY

3.1 INTRODUCTION

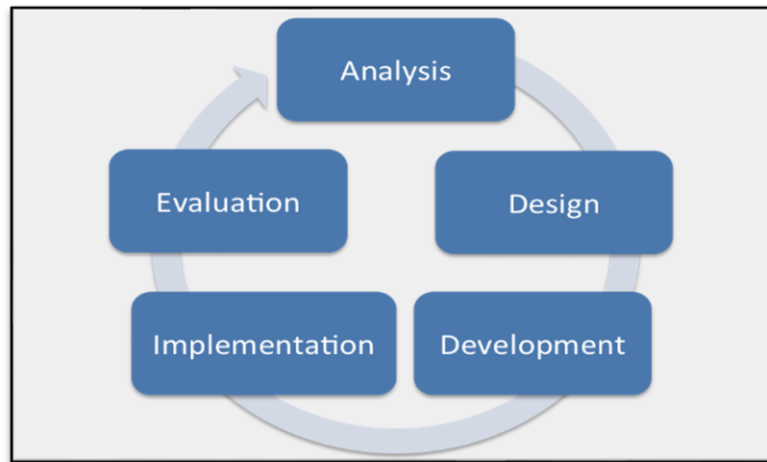
This chapter explained the general concept of a case study, strengths, and weaknesses of using this method knowing that theoretically case is exciting and data rich. It was noted that combining multiple techniques for eliciting data in case study research strengthens and confirmed results. Case study or research has been commonly used in social science. This research reviews the literature on case study as a strategic qualitative research methodology(Noor, 2008).

This chapter begins with research design, followed by identifying population, research and sampling method, data collection method, continued by research instrument and method of data analysis.

3.2 RESEARCH DESIGN

This study uses a quantitative method. The primary data were obtained through a survey by distributing **online questionnaires (GOOGLE FORM)**. The data collected consists of quantitative data. This is descriptive research whereby it provides various of information and opinion. It brought about deeper insights and better understanding of the project and product.

3.2.1 STAGE 1: Analysis



Wu et al. (2020) highlighted the importance of need analysis in identifying opportunities for innovation and designing products that better meet the needs and preferences of users and consumers. The study uses a combination of surveys and focus groups to identify user preferences and pain points with existing smartwatch interfaces and suggested that need analysis can inform the design of more intuitive and user-friendly smartwatch interfaces (Wu et al., 2020). While Hertzog (2008) recommended that a minimum of 30 participants be required to obtain an estimate of the variability of the outcome measure. Therefore, this study did a need analysis of the product with 30 respondents as a sample size. The findings of the need analysis as per diagram below:

This stage of the ADDIE MODEL involves analysing the needs of the target audience and identifying the goals of the plastic bottles rubbish bin. We think of a product that is simple to make and beneficial to others. So, we choose a plastic bottles rubbish bin that people can use a recycle plastic bottles turns to a rubbish bin. In this stage, the team would brainstorm potential ideas for the plastic bottles rubbish bin. We use a feasibility study method to minimize plastic and replace it with a rubbish bin and we also targeted general group of people aged 20 to 50 years old as our respondent.

3.2.2 STAGE 2: Design

The second stage in ADDIE Model is the design stage. In this stage, we as a team finally come up with the idea of the final product that we want to create. We agreed to create a plastic bottles rubbish bin. The reason we chose it is because this can recycle and sustainable way to users for throw away the waste. As for the design, that involves in plastic bottle rubbish bin is that in collecting the materials and sketching the product layout, we want our product to be as realistic as it can be to the original scene. So, we started to design our product that we have finalized.

Color:

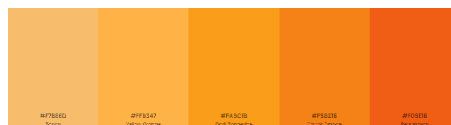
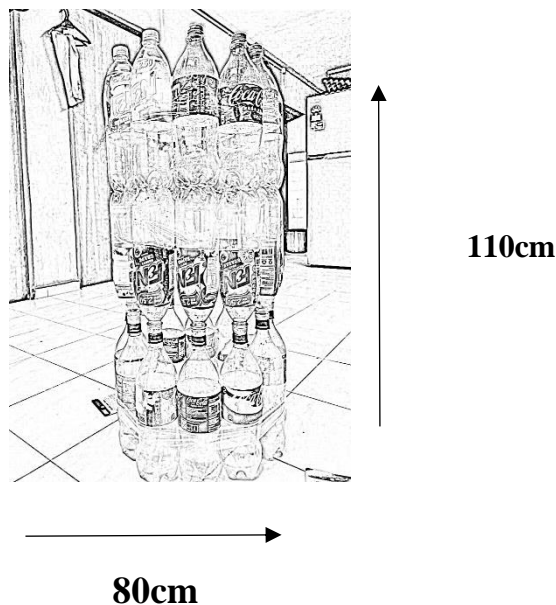


Figure color: Color for plastic bottles rubbish bin

Color combination playing the main role of one's closely associated with harmony and peace. It is a color that evokes trust, honesty, and confidence. It also reduced stress and creates a sense of relaxation and calm.

Size:



Type of Bottles using: Plastic (1.5 L)



Plastic bottles are best choice for recycling it to rubbish bin. It's good for energy saving, good for the health of wildlife and humans. Plastic bottles can make the rubbish bin stand stable and last long time. It won't be damage easily and suitable for making this rubbish bin.

3.2.3 STAGE 3: Development

We follow the plan as we create the product. In advanced the product is ready for usage, we get our supervisor's advice on what we can do, and we want our product to be suitable because we want users to find it to be extremely helpful. We start to develop our product into a plastic bottle rubbish bin.

1. Materials used for making the rubbish bin are 1.5L Plastic Bottles, Hot Glue Gun, Sellotape, Hot Glue Stick and Gray Tape.



2. Collect enough bottles and arrange it for make the rubbish bin.



3. Join each plastic bottle by gluing the body part of the bottle. Leave for 5 minutes for each hot glue liquid on the plastic bottle.



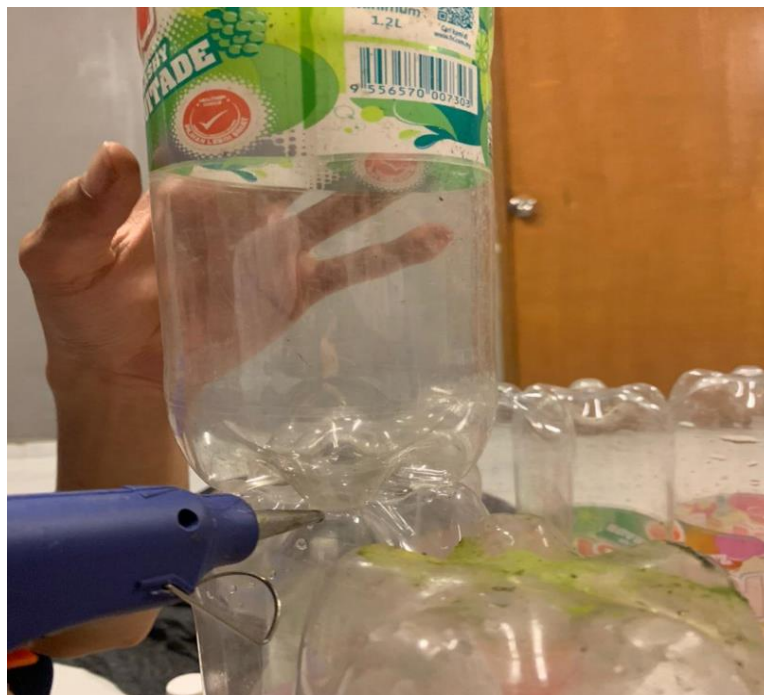
4. Strengthen the product by using tape around the bottle plastic.



5. Repeat steps 1 to 4 to make 1 other set of plastic bottles. Join the two sets of bottles by gluing at the lid. Leave for 5 minutes for each hot glue liquid on the plastic bottle cap to dry.



6. Repeat steps 1 to 4 to make 1 other set of plastic bottles. Join the two sets of bottles by gluing at the bottom of the plastic bottle.



7. Strengthen the product by using tape around the bottle plastic.



8. To make it stronger and more stable, the plastic body of the bottle is glued again.



9. Finally the product has been built neatly. Then we put a large black garbage plastic to make it look like it can be used properly.



3.2.4 STAGE 4: Implementation

This implementation stage involves launching the plastic bottles rubbish bin and making it available to the targeted audience.



3.2.5 STAGE 5: Evaluation

Reviews and feedback from customers (QUESTIONNAIRE / GOOGLE FORM)

INSTRUMENT SECTION	ASPECT MEASURED AND EVALUATED	NUMBER AND TYPES OF QUESTION	NUMBER OF QUESTION	REFERENCES
Section A	Background Respondent	3 Items	3	(Zhang & Wen, 2014)
Section B	Customer Acceptances	7 Items (Likert Scale Question)	7	(Wright Berkeley Student Recycling & Wright, 2011)

3.3 SAMPLING TECHNIQUE

This study uses non-probability sampling which is convenience sampling. The study implements convenience sampling because it involves selecting participants who are easily accessible or readily available. Convenience sampling allows for flexibility in selecting participants who are always available or who can refer to other potential participants. Convenience samples, as the name implies, are more easily obtained(Lunneborg, 2007).

3.4 SUMMARY

This chapter conclude all the method that be needed to use in the research. It also highlights a clear view of all the questions towards research methodology towards the research. Starting from the data collection method, data analysis method until the sampling technique. Next, it also states that the whole idea of the product look like is coming from the research design. The research procedure in this study explained in detail. Lastly, this chapter help in improve the product by the feedback from public as consumers or customers.

CHAPTER 4

ANALYSIS AND RESEARCH FINDINGS

4.1 INTRODUCTION

This chapter will represent the result that has been obtained to see the acceptances of our product, The Rubbish Bin Using Bottles Plastic Recycle, which has been shown as above. The result from our online questionnaire were analysed in more detail to conclude our project based on the objective which has been stated. This product will be use to our respondent which are users from housing area at Subang Jaya.

4.2 Reliability Analysis of Questionnaire

The reliability of a questionnaire refers to the degree to which it consistently and accurately measures the intended constructs or variables. In other words, it is a measure of the stability and consistency of the questionnaire's results over time and across different conditions or populations.

Reliability is crucial in questionnaire design because it ensures that the instrument is dependable and produces consistent results. It helps researchers and practitioners have confidence in the data collected from the questionnaire and the conclusions drawn from it.

4.3 DESCRIPTIVE ANALYSIS

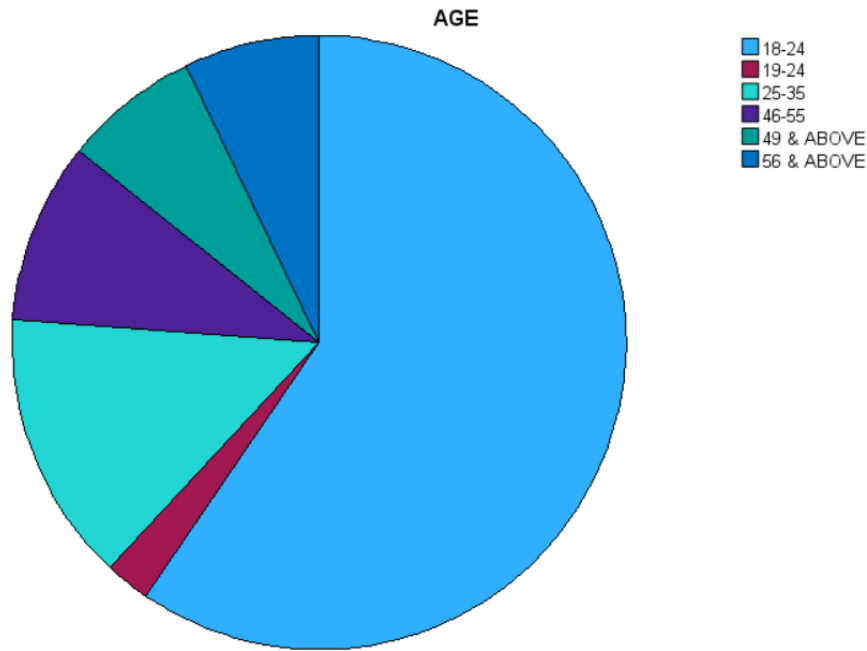


Figure 4.1.1

The age of the respondents is depicted in Figure 4.1.1 above. The respondents' ages range from 18 & above and are broken down into 6 age groups. The first circle is made up of the department's 59.5% (25 people) of people between the ages of 18 to 24. The second age categories for those between the ages of 19 to 24 are 2.4% (1 person) for those between the ages of 25 to 35 14.3% (6 people). The third level comes from the group of respondents aged 46 to 55 9.5% (4 people), and the group of respondents from the age of 49 & above 7.1% (3 people). The fourth level comes from the group of respondents aged 56 & above 7.1% (3 people). In conclusion, the respondents' ages range from 18 and above is average.

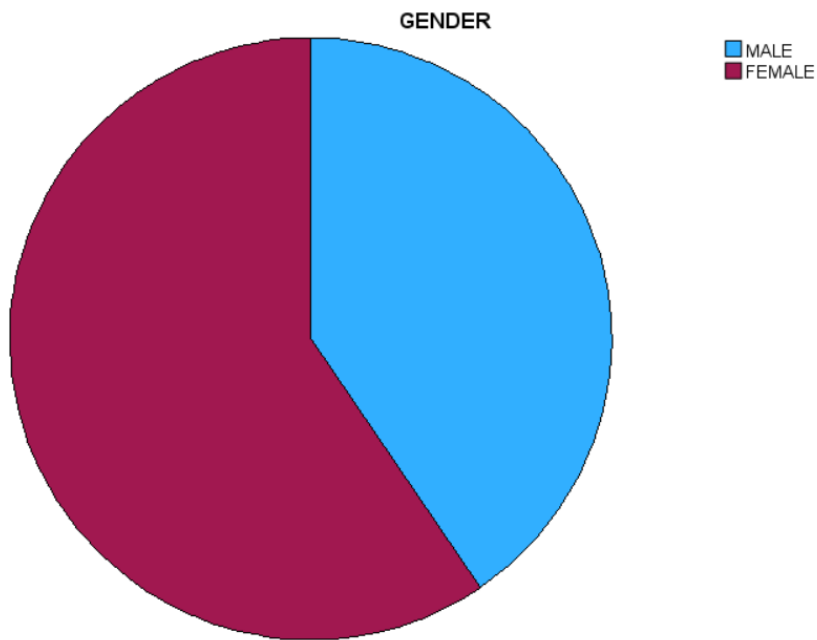


Figure 4.1.2

This survey had 42 respondents, with 25 (59.5%) of them women and the remaining (up to 40.5%) men (17 people). We can infer from Figure 4.1.2 above that there are generally more female respondents than male respondents. This is a result of the gender imbalance. Finding the exact same number of responders by gender is really challenging.

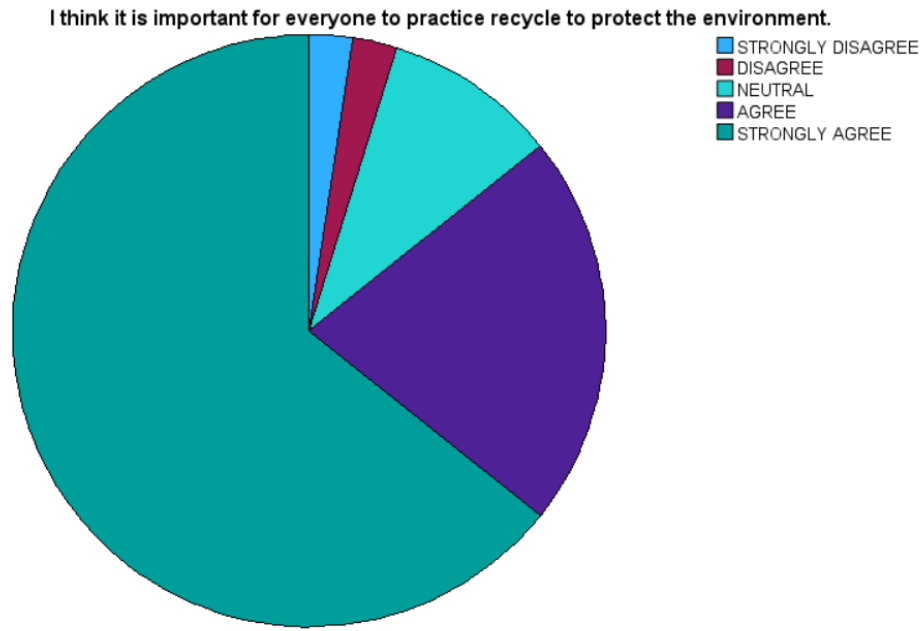


Figure 4.1.3

Figure 4.1.3 shows the number of respondents who strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5) with I think it is important for everyone to practice recycle to protect the environment. Most respondents strongly agreed that with I think it is important for everyone to practice recycle to protect the environment. A total of 27 respondents strongly agreed and 9.5% choose neutral. In conclusion, more than 50% of all respondents support that with I think it is important for everyone to practice recycle to protect the environment.

I think the idea of this concept is good and I am interested in trying the rubbish bin that made from the plastic bottles recycle.

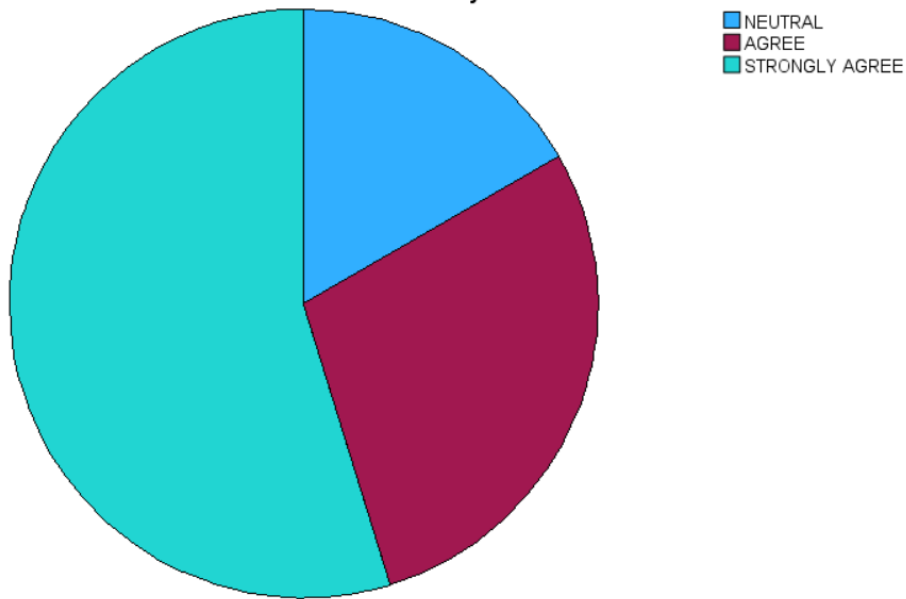


Figure 4.1.4

Based on the analysis in figure 4.1.4, the highest response is strongly agreed about I think the idea of this concept is good and I am interested in trying the rubbish bin that made from the plastic bottles recycle which is 54.8% (23 people). While 28.6% (12 people) of the respondents also agreed with the statement and 16.7% (7 people) of the respondents choose neutral.

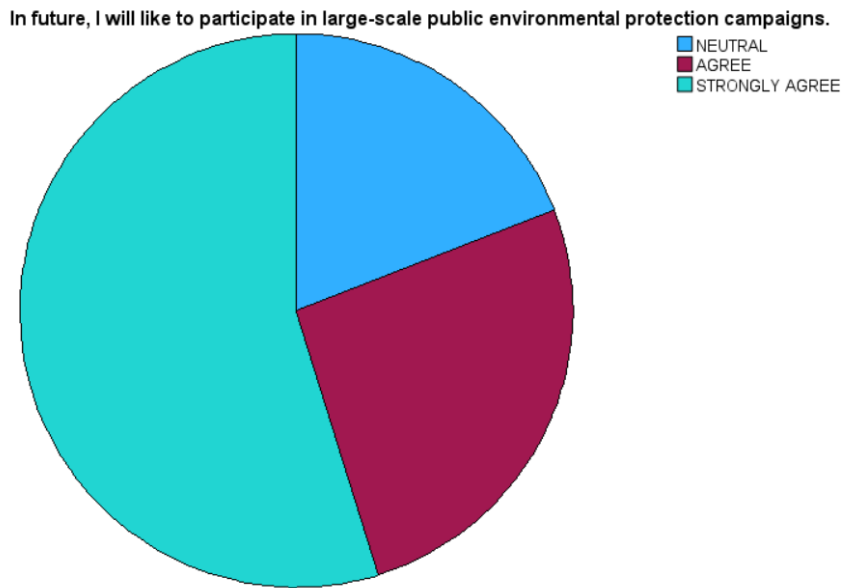


Figure 4.1.5

Based on the analysis in Figure 4.1.5, the highest response is very much in strongly agree that In future, I will like to participate in large-scale public environmental protection campaigns which is 54.8% (23 people). While 26.2% (11 people) of respondents agreed with the statement and 19% (8 people) of the respondents chose neutral about In future, I will like to participate in large-scale public environmental protection campaigns.

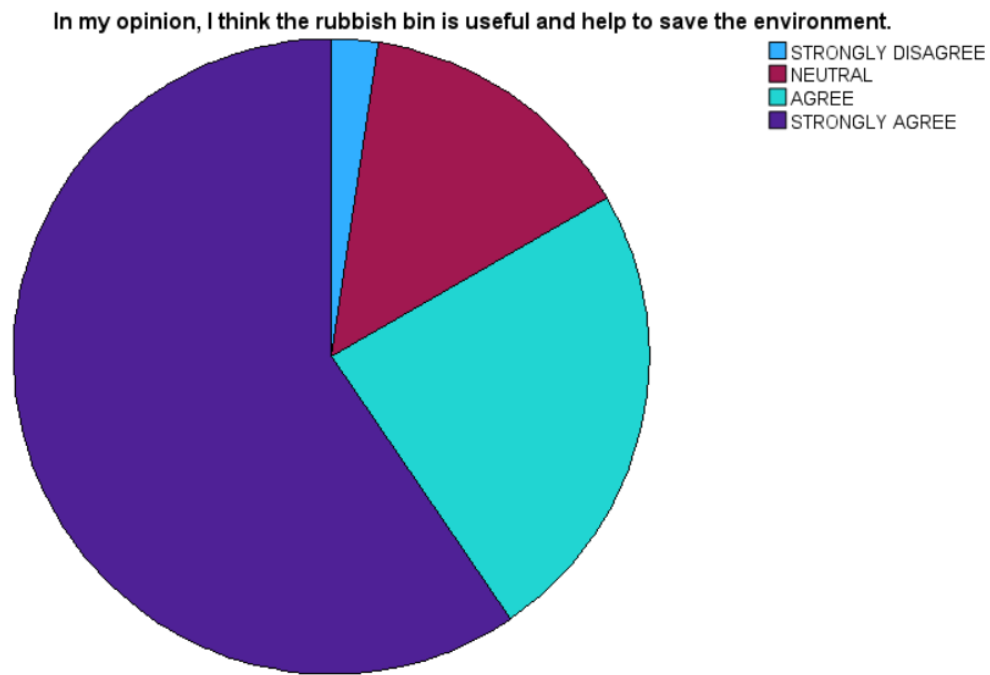


Figure 4.1.6

In figure 4.1.6, most of the respondents of the study which is 59.5% (25 people) gave an answer that strongly agreed that In my opinion, I think the rubbish bin is useful and help to save the environment and only 23.8% (10 people) agreed about the statement. However, 14.3% (6 people) of them chose neutral. However, there are a few respondents who strongly disagree, namely 2.4% (1 person) who stated that In my opinion, I think the rubbish bin is useful and help to save the environment.

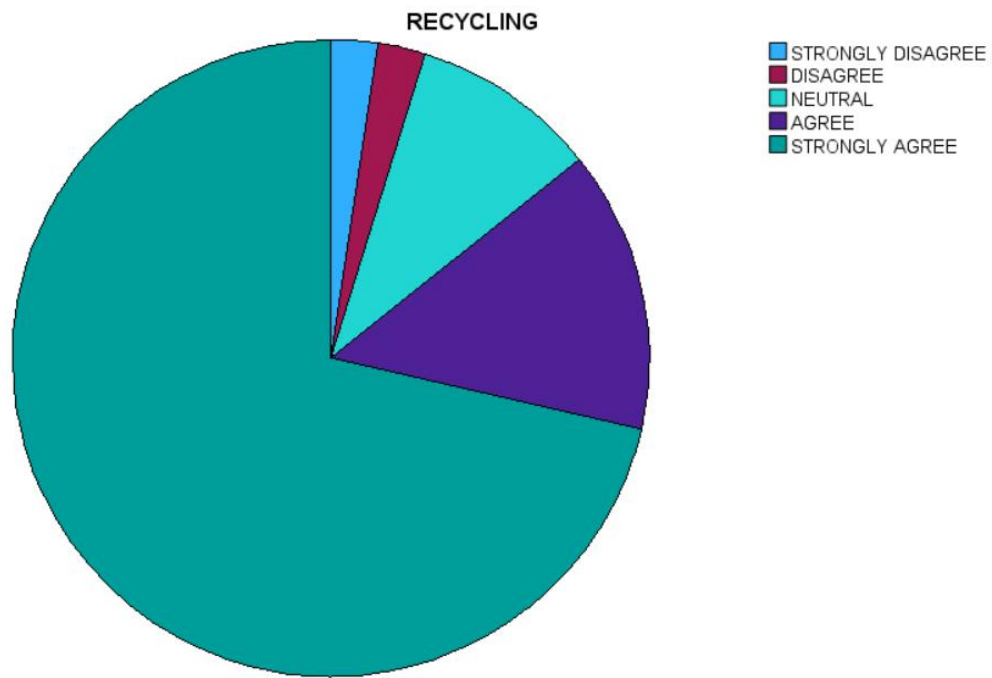


Figure 4.1.7

Based on the analysis in Figure 4.1.7, the highest response is strongly agreed about Recycling which is 71.4% (30 people). While 14.3% (6 people) of the respondents also agreed with the statement and 9.5% (4 people) of the respondents chose neutral. The results of this questionnaire showed that 2.4% (1 person) disagreed and 2.4% (1 person) strongly disagreed with Recycling.

The cost allocated in making this rubbish bin is very reasonable because it does not consume a large amount.

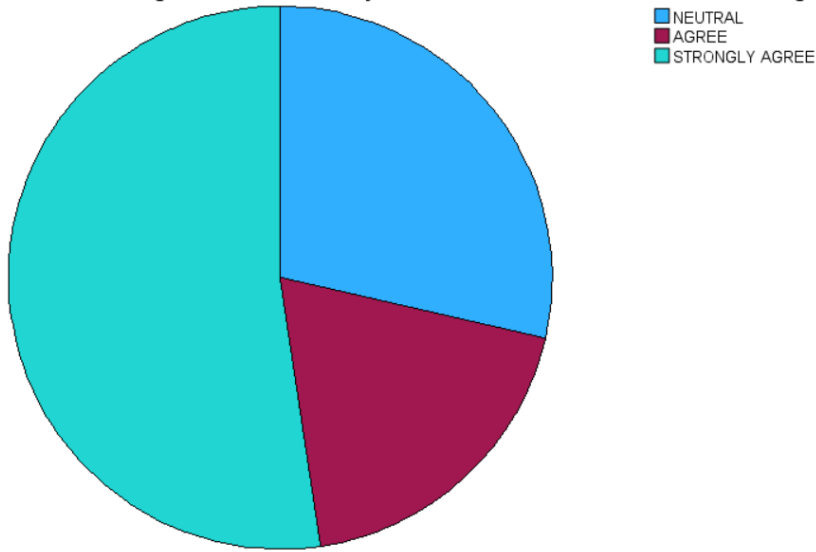


Figure 4.1.8

In Figure 4.1.18, most of the respondents of the study which is 52.4% (22 people) gave an answer that strongly agreed that the cost allocated in making this rubbish bin is very reasonable because it does not consume a large amount and only 19% (8 people) agreed about the statement. However, 28.6% (12 people) of them chose neutral.

4.4 The Mean Score

In statistics, the mean score (also known as the arithmetic mean) is a measure of central tendency that represents the average value of a set of data. It is calculated by adding up all the values in the data set and dividing the sum by the total number of values.

SECTION	VARIABLES	MEANS	LEVEL
SECTION B	Recycling makes a difference in protecting the health of the environment.	4.5	HIGH
	I think it is important for everyone to practice recycle to protect the environment.	4.4286	HIGH
	I think the idea of this concept is good and I am interested in trying the rubbish bin that made from the plastic bottles recycle.	4.381	MODERATE
	The concept of this trash can is a very creative idea because it is made from recycled materials and can be beautified with decorative sketches and colouring.	4.4286	MODERATE
	The cost allocated in making this rubbish bin is very reasonable because it does not consume a large amount.	4.2381	MODERATE
	In my opinion, I think the rubbish bin is useful and help to save the environment.	4.381	HIGH
	In future, I will like to participate in large-scale public environmental protection campaigns.	4.3571	MODERATE
TOTAL AVERAGE (USERS ACCEPTANCE)		4.387	MODERATE

CHAPTER 5

CONCLUSION & RECOMMENDATION

5.1 INTRODUCTION

In the previous chapter, the researchers have obtained results from the data collected. This chapter will discuss on the findings from the previous chapter, and it contains four parts which are the interpretation of results, limitation, recommendation and conclusion of the study.

5.2 FINDINGS

In this chapter, the findings of the research on plastic bottles rubbish bins are presented. The study aimed to develop a rubbish bin used from plastic bottles to reduce plastic wastage and to identify public acceptance of recycling made from plastic bottles. The findings are discussed below:

5.2.1 Impact of The Rubbish Bin using Plastic Bottle Recycle

The research revealed that plastic bottles have a positive impact on the environment. Users who used the rubbish bin that made from plastic bottle recycle can learn the importance of recycle materials and pollution towards the environment. The convenience and accessibility of rubbish bin using plastic bottle recycle allowed users to keep clean and save the environment anytime and anywhere, enabling them to practice and reinforce their importance towards the environment. Plus, they can make an improvement towards the pollution by help reduce the wastage.

5.2.2 Effectiveness of The Rubbish Bin using Plastic Bottle Recycle

The study found that the rubbish bin using plastic bottle recycle were effective in maintaining the environment and help reduce the wastage pollution. The rubbish bin using plastic bottle recycle was highly effective in achieving returning natural resources to nature to ensure its sustainability. This further reinforces that recycling can help in environmental.

5.2.3 Challenges of The Rubbish Bin using Plastic Bottle Recycle

Despite the benefits, several challenges were identified in Plastic Bottles Rubbish Bin. Limited time for creating and approaching a few places to put our product. Other than that, technical issues in sense of building the product and handover it to our selected places.

5.3 LIMITATIONS

It is important to acknowledge the limitations of this research. In addition, this study has focused on a specific context and sample and it also limits the generalizability of the findings to other matters. Research has been conducted using entirely plastic bottles and it presents the limitations faced. The limitation experienced in this study is the plastic bottle size that is too limited for a product. The square area of the product produced from this plastic bottle causes it to be very limited by only using 1 bottle size. Then, the sample size we can get is limited because of the time. The sample size is too small because there is not enough time to get a bigger one.

5.4 RECOMMENDATION

The following are recommendations for future research subjects. The sampling procedure has to be improved with sample size. Based on data in this study, the sample size insufficient which only 42 respondents. The bigger the sample size, the more accurate the result of the research. A larger sample size needs to be applied in this study to help researchers identify outliers in data.

The development of rubbish bins (product) must enhance in terms of design, materials and others. According to the final product, the design needs to alternate with small bottle plastic for better size, Therefore, the product also can make more convenient, accessible, handy and appealing design for attract the consumer to consume.

The researchers hoped that the recommendation can be emphasized to improve the research skills and the product can be utilized by community public. To shed light on the factors that influence consumer preferences and acceptance of products, the researcher needs to explore the research to enhance the quality of products.

5.5 CONCLUSION

The research was based on the objectives which are to develop a rubbish bin used from plastic bottles to reduce wastage of plastics and to identify the public acceptances towards our product, The Rubbish Bin Using Plastic Bottle Recycle.

Based on the results of data it shows that respondents have positive responses towards products made from bottle plastic recycle. However, the sample size of data is too small and not enough may make it difficult to determine if a particular outcome is a true finding and low reproducibility.

After the analysis of reliability test, results have shown that all of the dependent variables have positive responses in acceptances. It refers to the questionnaire we have created and we analyse all the mean score which we can conclude the result as a moderate level. However, the sample size of data is too small and not enough may make it difficult to determine if a particular outcome is a true finding and low reproducibility.

After the data collected, results have shown that all the two independent variables include respondents of questionnaire and products have positive significant relationship with customer acceptance toward rubbish bin by plastic bottle recycle. The study has shown that the number of respondents has the strongest relationship with the products according to the sample size. This shows that respondents most agreed with the products.

APPENDIX A

✓ Gantt Chart

Gantt Chart Rubbish Bin

Activity	Months / Weeks													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Topic Choosing													
Literature Review														
Consultation with Supervisor														
Proposal Planning						*								
Product Design and Development														
Product Testing and Validation														
Final Report														
Final Report and Preparation for Final Presentation													**	**

**Proposal presentation will be held in the 6th week.*

***The final project presentation will be held on the 14th week.*

APPENDIX B



CUSTOMER ACCEPTANCES TOWARDS THE RUBBISH BIN USING PLASTIC BOTTLE RECYCLE

NAME	MATRIX NUMBER
JEEVAMALAR JEEVANGADAN	08DPM20F2017
NUR ANISAH BINTI ZAINAL ABIDIN	08DPM20F2099
PRABPALL SINGH	08DPM20F2040
MUHAMMAD HAMDAN BIN ANGGRET	08DPM20F2031

DIPLOMA IN BUSINESS STUDY DEPARTMENT

SESSION: 2 2022/2023

CUSTOMER ACCEPTANCES TOWARDS THE RUBBISH BIN USING PLASTIC BOTTLE RECYCLE

Dear respondents,

We are the students from Polytechnic Sultan Salahuddin Abdul Aziz Shah, Shah Alam, conducting research on Customer Acceptances Towards the Rubbish Bin Using Plastic Bottle Recycle. The purpose of conducting this survey is to enable us to gain sufficient information and data as supporting validation for this research to be relevant and effective.

We believe that your participation in this study will help and provide us with further information in completing the research. This survey consists of only three sections related to our topic and we are interested to know your view. It will take only 5 minutes to complete the questions form. Hence, we really appreciate your precious time and thanks for your support in participating. All the information provided by you will be held confidential and only be used for academic purposes. Your cooperation in completing and spreading this survey would be highly appreciated. For further information or inquiries, please do not hesitate to contact us based on the contact details below.

Thank you,

Your sincerely,

NUR ANISAH BINTI ZAINAL ABIDIN

Student of Diploma in Business Study.

Department of Commerce,

Polytechnic Sultan Salahuddin Abdul Aziz Shah,

40150, Shah Alam, Selangor.

Tel: +6011127544639

E-mail: nizam9302@gmail.com

Section 1 of 3 – TITLE / INTRODUCTION

CUSTOMER ACCEPTANCE TOWARDS RUBBISH BIN BY USING PLASTIC BOTTLE RECYCLES

Plastic bottles are among the materials that cause plastic pollution in the environment. Therefore, by practicing recycling, it can help in reducing pollution and saving various lives. The concept of recycling plastic bottles into a rubbish bin is a creative idea because it can be made by the public and used for daily use anywhere. A rubbish bin is a daily use that everyone needs to dispose of trash.

Section 2 of 3

Section A: Demographic Profile

This section needs your basic profile to know the percentages of respondents. Please choose based on your personal information. All information given will be kept confidential & it will only be used for academic purposes.

i. *Gender*

Male

Female

ii. *Age*

18 & Below

19 – 28

29 – 38

39 – 48

49 & Above

iii. *Level of Education*

SPM

DIPLOMA

DEGREE

MASTER

Other

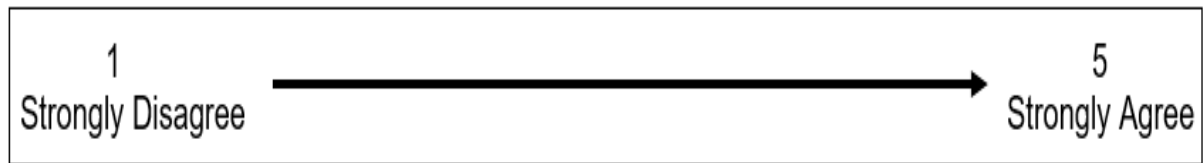


Section 3 of 3

Section B: Customer Acceptances

This section contains several statements that show your behaviour & acceptance of rubbish bin made from recycled materials, i.e., plastic bottles. Please indicate your level of agreement with each statement.

This section using Likert Scale to answer the statement below.



NO	SECTION B: CUSTOMER ACCEPTANCE TOWARDS RUBBISH BIN BY USING PLASTIC BOTTLE RECYCLES	SCALE				
1	<p>Recycling makes a difference in protecting the health of the environment.</p> <p>Kitar semula boleh membawa perbezaan dalam melindungi kesihatan alam sekitar.</p>	1	2	3	4	5
2	<p>I think it is important for everyone to practice recycle to protect the environment.</p> <p>Saya fikir ia penting untuk semua orang mengamalkan kitar semula bagi melindungi alam sekitar.</p>	1	2	3	4	5
3	<p>I think the idea of this concept is good and I am interested in trying the rubbish bin that made from the plastic bottles recycle.</p> <p>Saya rasa konsep ini adalah idea yang bagus dan saya berminat untuk mencuba tong sampah yang diperbuat daripada botol plastik kitar semula.</p>	1	2	3	4	5
4	<p>The concept of this trash can is a very creative idea because it is made from recycled materials and can be beautified with decorative sketches and colouring.</p> <p>Konsep tong sampah ini merupakan idea yang sangat kreatif kerana ia diperbuat daripada bahan kitar semula dan boleh dicantikkan dengan lakaran hiasan dan warna.</p>	1	2	3	4	5
5	<p>The cost allocated in making this rubbish bin is very reasonable because it does not consume a large amount.</p>	1	2	3	4	5

	Kos yang diperlukan untuk membuat tong sampah ini sangat berpatutan kerana ia tidak melibatkan jumlah yang besar.					
6	In my opinion, I think the rubbish bin is useful and help to save the environment. Pada pendapat saya, saya berpendapat tong sampah ini berguna dan membantu dalam menjaga kelestarian alam sekitar.	1	2	3	4	5
7	In future, I will like to participate in large-scale public environmental protection campaigns. Pada masa hadapan, saya ingin mengambil bahagian dalam kempen perlindungan alam sekitar awam berskala besar.	1	2	3	4	5

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