DESIGN AND DEVELOPMENT OF PLASTIC-BASED LAUNDRY BAGS TO SUPPORT A GREENER WORLD

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DIPLOMA IN INTERNATIONAL BUSINESS

SESSION II 2022/2023

POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH

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This report is submitted to the Commerce Department as fulfilling part of the award requirements Diploma in International Business

COMMERCE DEPARTMENT

SESSION II 2022/2023

DECLARATION OF ORIGINALITY

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We,	**NURUL ALIYA BINTI RAMLE**	**08DPI20F2003**
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Are the final year student of Diploma in International Business, Commerce Department, Politeknik Sultan Salahuddin Abdul Aziz Shah, located at Persiaran Usahawan, 40150, Shah Alam, Selangor.

We acknowledge that the project is our original works and inventions without taking or imitating any intellectual property from other parties except where proper citations are made.

We agree to relinquish ownership of the project intellectual property to the Polytechnic to meet the need for the award Diploma in International Business.

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ABSTRACT

Almost every industry uses plastics in some capacity, including the manufacturing of packaging, building and construction, textiles, consumer goods, transportation, electrical and electronic equipment, and industrial machinery. People may use plastic because it is affordable, widely used, and easily accessible. Plastic can be found in everything from packaging materials to plastic bottles, straws to plastic bags, and much more because it is a cheap and long-lasting material. In addition, plastic is also resilient and shields users from the elements and contaminants, but most of it cannot be recycled or decomposed. Plastic does not decompose well because it is not an organic material. Despite being extremely useful in daily life, plastic waste is notoriously difficult to dispose of. During this time of expansion, the world was also devastated by various environmental issues involving plastic. People are no longer held responsible for the widespread dumping of plastic waste, which has polluted and endangered the environment. Malaysia is also not an exception when it comes to the world's highest plastic waste disposal rates. Because of this, we created a product called MOG Laundry Bag, which uses plastic waste as the primary body, such as plastic rice for laundry bags. The goal of manufacturing MOG Laundry bag products is to lessen the issue of rising pollution concerns. When environmentally friendly products are produced, only plastic rice serves as the only material difference between the shape and the frequently used laundry bag. The fact that MOG Laundry Bag is superior to competing products and does not harm any living things or contribute to life-cycle pollution enables users to use it instead of those competing products. Additionally, most of us are unaware of how plastic waste affects the environment. Plastic has integrated seamlessly into our daily lives. Plastic consumption has been steadily rising over the years. Its rapid rise can be attributed to a variety of qualities, including low density, strength, user-friendly designs, fabrication capabilities, extended life, low weight, and low cost. Plastic rice is particularly visible because it accounts for a significant portion of total solid waste. Plastic wastes have been recognized as a severe solid waste concern precisely because of their high visibility. Instead of just throwing the rice plastic, we use as a part of our MOG Laundry bag to reduce plastic waste. We performed a questionnaire to offer exposure and information about our product, MOG Laundry Bag. According to the survey, up to 75% of respondents said they throw away plastic rice because there is no use. Through exposure, most respondents agreed to use our MOG Laundry bag, as shown in the questionnaire. In conclusion, the production of this MOG Laundry bag product is more to the good as we have an effort to reduce pollution with the innovation of the laundry bag.

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CHAPTER 1 INTRODUCTION

1.1 Introduction

Plastics are human-made materials manufactured from polymers or long chains of repeating molecules. First invented in the 1860s but developed for the industry in the 1920s, plastic production exploded in the 1940s, becoming one of the fastest-growing global industries. In the last quarter of the 20th century, an enormous number of products were created using plastics. Most of these bags are disposed of as waste after single-time usage. Ecological problems require taking measures for a more rational life cycle of plastics from production to processing and the development of eco-friendly materials.

The global plastic waste pollution problem is constantly rising at an unprecedented rate, and it is deeply troubling to realize that a significant amount of plastic waste has never been recycled (Raudhah, 2020). Plastic production in the world has already surpassed that of textiles, paper, and aluminium. Yet, the widespread production, usage, and disposal of plastics has posed a severe environmental problem.

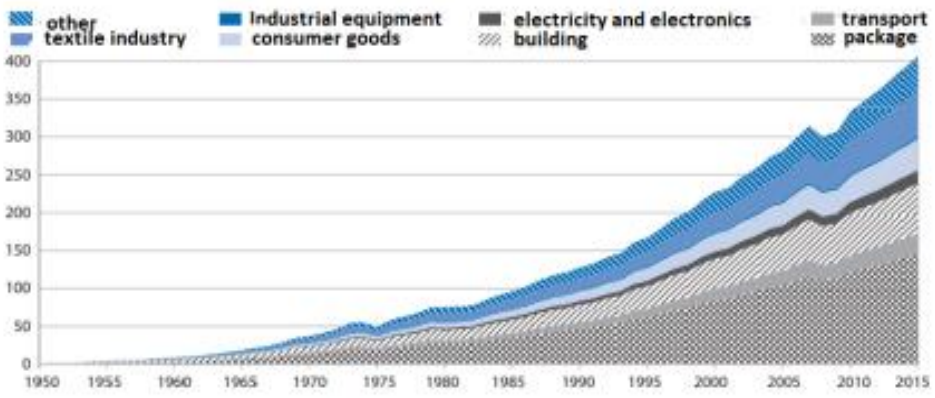


Figure 1 World production of plastic by economic sectors (millions of tons)

Plastic is utilized in a wide range of applications, including packaging, food processing, medicines, electronics, textiles, and construction. Plastic manufacturing in the world has surged from 2 million tonnes in the 1950s to 400 million tonnes in 2015, with the last 13 years

accounting for half of the total plastic production (figure 1). Plastic manufacture and consumption will grow in tandem with population and production scale (Shershneva et al., 2021)

Most of the plastic is used for packaging, which eventually degrades into the garbage. Plastic waste is produced by polyethylene, polypropylene, polyvinyl chloride, polyethylene terephthalate, polycarbonate, and polystyrene (Christen, 2017). Each year, only 14-18% of total plastic garbage is collected for reuse, with the remaining 24% disposed of. The remaining of waste is either burned, dumped, or discharged into the environment (OECD, 2018). Plastic is recycled at a rate of approximately 30% in the EU, 10% in the US, and on a very small scale in most developing countries (Christen, 2017).

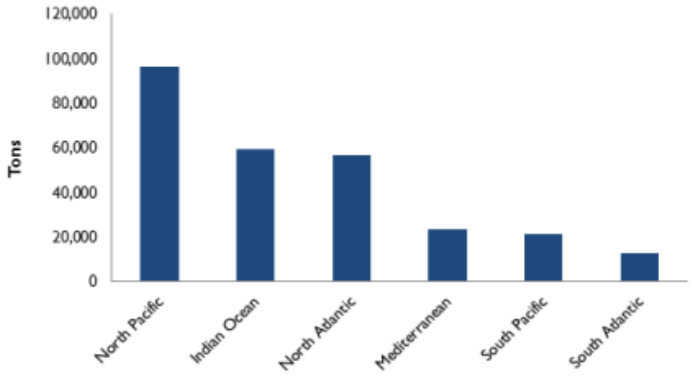


Figure 2 Plastic pollution in the World's Ocean, 2014

Every year, around 10-20 million tonnes of plastic wind up in the oceans (UNEP, 2015). Plastic does not degrade once it enters the ocean. It degrades into microscopic fragments that are consumed by sea creatures and passed up the food chain, transporting chemical contaminants from prey to predator (UNEP, 2015). According to a recent study, 5.25 trillion plastic particles weighing 268,940 tonnes are currently floating in the world's waters.

Because plastics are carried by wind and currents, very few parts of the ocean may be free of plastic contamination. The North Pacific gyre has the most plastic, with over 2 trillion pieces weighing over 96,000 tonnes (See Figure 3). The Indian Ocean in the southern hemisphere has more plastic pollution than the South Pacific and South Atlantic combined (Gourmelon et al., 2015)

1.2 Background of Project

Since 2000, the manufacturing of plastics has experienced one of the fastest growth rates across all industries. One of the world's largest plastic production industries, Malaysia has over 1,300 plastic manufacturers, and in 2016, resins worth 24 billion Malaysian ringgit (MYR) were exported to plastic producers all over the world. According to global trends, packaging is the primary application for Malaysian plastic. (Chen et al., 2021).

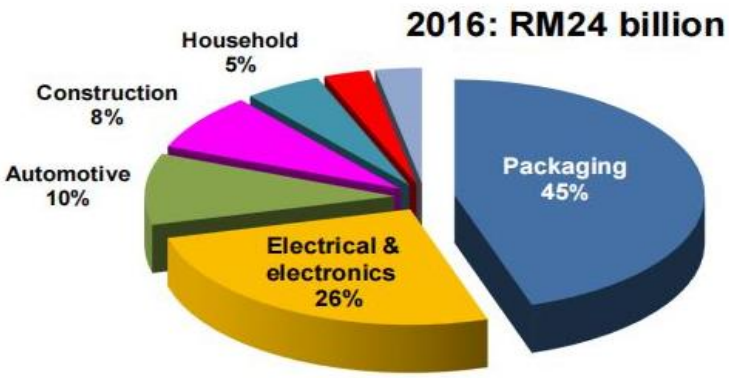


Figure 3 Major Market Segments for Plastic Products (MPMA 2016)

In terms of the top 20 nations with poorly managed plastic waste, Malaysia came in at number eight. Malaysia had mismanaged 0.94 million tonnes of plastic waste in 2010, of which 0.14 to 0.37 million tonnes could have ended up in the oceans. High individual consumption of single-use plastic was the main cause of this problem. Single-use plastic is a category of disposable plastic item designed for a single use only. The reduction of single-use plastic, which led to a decline in plastic pollution, is thought to have been significantly influenced by residents' social behaviour. Landfills created by improper single-use plastic disposal by Malaysian citizens also contributed to serious environmental issues. For instance, the decomposition of each that ends up in landfills takes between 400 and 1000 years and requires light energy. (Van et al., 2021).

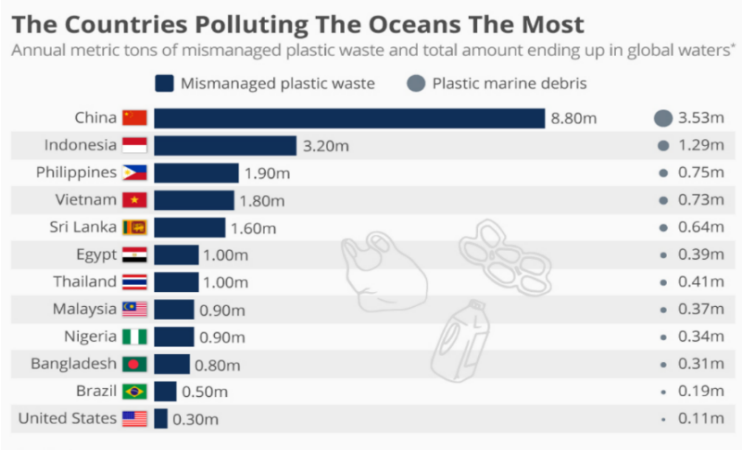


Figure 4 Mismanaged waste from developing countries is a major source of ocean plastics.

Plastic recycling refers to the reprocessing of recovered plastic scraps into usable products. Because most plastics are non-biodegradable in nature, the primary work is to reduce waste emissions, manage waste effectively, and recycle waste. Plastic recycling is an important component of global efforts to reduce the 8 million tonnes of plastic waste entering the Earth's ocean each year. (Okunola et al., 2019).

From the mentioned statement, this project will be a stepping-stone for reducing plastic waste by designing and developing plastic-based laundry bags to support a greener world. This laundry bag is named ‘My Own Green Laundry Bag’ in a short MOG laundry bag.

1.3 Problem Statement

Plastic is a substance that people use frequently. In many different businesses and aspects of daily life, it has come to be indispensable. The global production of plastic has already surpassed that of textiles, paper, and aluminum. The ubiquitous manufacture, usage, and disposal of plastic, however, have turned into a severe environmental problem. (Shershneva E., 2021). One of the fastest-growing environmental initiatives ever is the global movement to reduce plastic trash. Nevertheless, it hasn't been sufficient to dent the mounting amount of trashed plastic that winds up in the oceans.

Figure 5 Illegal dumping in Kajang, The Star News

Since 2000, the manufacturing of plastics has experienced one of the fastest growth rates across all industries. One of the world's leading plastic production businesses, Malaysia has over 1300 plastic manufacturers, and in 2016, resins worth 30 billion Malaysian Ringgit (MYR) were shipped to plastic companies all over the world. (Chen H, Nath T et al.,2021). Plastic pollution is recognized to be hazardous to animals, negatively impacting human food supplies, especially the seafood supply chain (Godswill C et al.,2019). Plastic pollution is extremely harmful to large aquatic creatures, as detailed in the book Introduction to Marine Biologyas the single greatest threat to marine life. Several marine species, such as sea turtles, have been shown to have substantial amounts of plastic in their stomachs. When this happens, the marine animal usually dies because the plastic clogs its digestive tract. Sea animals can become entangled in plastic trash, such as discarded nets, which can kill or damage them (Godswill C et al., 2019).

Polymers have an impact on species that do not live solely in the waters. Seabirds are also suffering greatly. In 2004, it was estimated that gulls in the North Sea had roughly thirty particles of plastic trash in their stomachs. Seabirds frequently mistake floating garbage on the sea's surface for prey. Their food sources have already swallowed plastic garbage daily, spreading plastic pollution from prey to predator. Ingested material can physically harm and block a bird's digestive tract, reducing its capacity to digest and finally leading to famine, malnutrition, and death. Hazardous substances such as PCBs (polychlorinated biphenyls) accumulate on the ocean's plastic surface as well (Godswill C, 2019).

According to many scientists and environmentalists, the solution is to stop plastic garbage from entering rivers and seas in the first place. This might be achieved through

enhancing recycling and waste management systems, improving product design to account for the transient nature of disposable packaging, and reducing the production of superfluous single-use plastics. As a result, we create our products from recycled materials such as rice plastic. As a way, MOG Laundry Bag can prevent the previously mentioned harmful environmental effects. Poor landfilling and plastic waste management systems have caused numerous environmental and human health issues in Malaysia, earning the country an unfavorable reputation as a significant contributor to the marine plastics problem.

Malaysia should strive for a closed-loop plastic waste recycling system based on a circular economy model, in which plastics are never discarded. This must be accompanied by financial investments to construct a green supply chain and develop a consistent waste management model, which involves standardizing plastic production and recycling operations. Furthermore, better legislative enforcement, stricter waste separation at the source, and environmental education programs are required. (Chen et al., 2021)

1.4 Research Question

At the end of this research, it will be possible to answer the project questions. The project questions are as follows:

i. How to design and develop the MOG Laundry Bag?
ii. How to implement and evaluate the uses of MOG Laundry Bag for Society?

1.5 Objectives

The goal is to create an eco-friendly product to reduce plastic waste. A few objectives have been identified that will contribute to the achievement of this goal:

i. To design and develop MOG laundry bag.
ii. To implement and evaluate the effectiveness of laundry bags in the community.

1.6 Scope of Study

The goal of this initiative is to explain the applications of plastic other than discarding it into the sea and the environment. We will demonstrate by using goods made from discarded plastic. The purpose of this study is to investigate the critical features of plastic waste's impact on the ecosystem and to develop solutions to mitigate negative consequences. (Shershneva E,2021).

1.7 Significance of Study

Plastic waste has various harmful environmental effects. Plastic is everywhere. It is strong, light, cheap, and very versatile. Most of the plastic waste does not get reused or recycled. The study would bring a lot of benefits to society. By reducing plastic waste, it can prevent pollution by lessening the amount of new raw materials used. (Hidayat Y et.al., 2019) It also reduces greenhouse gas emissions, which contribute to climate change. As a result, the MOG Laundry Bag initiative can contribute to reducing the growth of the plastic waste problem. It could raise public awareness about the need for environmental preservation.

1.8 Operational Definitions

1.8.1 Plastics

Plastics are one of the most widely used materials since they are derived from synthetic organic polymers and are strong, light, versatile, and relatively inexpensive to produce. Plastics are used in a variety of products, including water bottles, clothing, food packaging, medical supplies, electronics, building materials, and more. (Chen et al., 2021)

Figure 6 Graphic courtesy of Greenpeace.

1.8.2 Single-Use Plastic

Single-use plastics are goods that are made primarily from fossil fuel–based chemicals (petrochemicals) and are meant to be disposed right after use. Single-use plastics are most used for packaging and service ware, such as bottles, wrappers, straws, and bags. (Van et al., 2021)

Figure 7 9 reasons to refuse single-use plastic.

1.8.3 Recycle

Recycling, recovery, and reprocessing of waste materials for use in new products. The basic steps in recycling are the collection of waste materials, their processing or manufacture into new products, and the purchase of those products, which may then be recycled again. Iron and steel scrap, aluminum cans, glass bottles, paper, wood, and plastics are examples of materials that are typically recycled. (Kamyar et al., 2020)

Figure 8 Recycle Items

1.8.4 Waste Disposal

Waste disposal means removing, discarding, recycling, or destroying unwanted materials. Proper waste management is necessary with steps involving the proper collection of waste and scientific treatments that may contribute less to water pollution, soil pollution, and air pollution. (Okunola et al., 2019)

Figure 9 Improper waste disposal Sungai Klang, Star Media

1.8.5 Laundry Bag

A laundry bag is a bag for clothes that holds dirty clothes to be washed or wet clothes to be dried. Laundry baskets are arguably one of the most important household items to have at home, as they likely will be used most days. (Hartomo et al., 2012)

1.9 Project Expected Outcomes

To summarise, it is believed that by the end of this study, the MOG Laundry bag, which is produced from plastic rice, would be able to reduce pollution caused by plastic waste. The use of plastic is essential today, so it is not a matter of concern today whether it can be used or not, the main matter of concern is the utilization of plastic waste. (Nahid Newaj 1, Mahadi Hasan Masud 2, 2014). With a quality product developed, it is possible to address the issue that occurred due to the limited amount of work put in.

1.10 Swot Analysis

A SWOT analysis is a systematic evaluation approach that examines the strengths (S), weaknesses (W), opportunities (O), and threats (T) associated with a process or structure in the broadest sense of these words. A SWOT analysis entails defining the process or structure's objectives, identifying the internal and external impacts on the degree to which these objectives are met, and, lastly, characterising the process or structure's strengths, weaknesses, opportunities, and threats. In general, a SWOT analysis may assist develop the examined entities for future rounds of enhanced goal attainment, and it generally has an exploratory character that brings to the fore issues that have not been discovered by other ways of study. (Leiber et al., 2018).

Strengths	**Weaknesses**
- Have good durability up to 10 KG - Waterproof MOG laundry bag - Innovative product - Low-cost so can provide good value	- Limited quantity and design of laundry bag - No variety in size - Low brand power and reputation - No market presence
Opportunities	**Threats**
- New market for the MOG laundry bag because it is the first-time design and development of a plastic-based laundry bag. - Demand for eco-friendly products is increasing because of rising awareness.	- Uncertain economic which affect purchasing power of customers. - Threats of new entrants are high because of a low capital requirement for creating MOG laundry bag

Figure 10 SWOT Analysis for MOG Laundry Bag

1.11 Conclusion

Plastic bags are wreaking havoc on the environment, particularly agriculture, all over the world. The usage of plastic bags has a negative impact on the environment, particularly its land, water, and air. Plastic bags are also a concern for local people and national governments' livelihoods, in addition to the significant cost of cleaning up, which falls on local and national governments. (Jalil M, Mian M, Rahman M, 2013). Plastic trash poses a serious threat to the environment and, eventually, civic life. To address the issues of plastic waste, waste management is critical. It necessitates community education and cooperation in a systematic collection. The systems differ from one country to the next and from one region to the next. Although international and European legislation exists, better monitoring is required to ensure full application. There is also a need for more education and awareness about plastic trash. Plastic trash has a lot of promise for being turned into commercial products. Plastic footprints and product labeling are likely, but they will require proper education to be relevant. (Mukheed,Muhammad, 2020)

CHAPTER 2 LITERATURE REVIEW

2.1 Introduction

In this chapter, using references such as scientific publications, books, and associated websites, we will explain the use of the ADDIE model which we use as a guide to produce the product “MOG laundry bag”.

2.2 Previous Studies/Review/Investigations

2.2.1 Plastics

Plastics are human-made materials derived from polymers, which are long chains of repeating molecules (Berlin, 2014). Plastics, which are technically sophisticated, lightweight, and inexpensive, are appropriate for a broad spectrum of applications. Polymers are used in a variety of industries and sectors, including transportation, construction, health care, food products, telecommunications, and consumer goods (Milan, 2013). The issue with plastic is not how it is used, which is generally safe, but rather how things created from it are disposed of (Woldemar et al., 2019). For more than 50 years, global plastic output has been increasing (Brussels, 2014). In 2013, 299 million tonnes of plastics were manufactured, indicating a 3.9 percent increase over 2012. Demand for plastic is increasing because of a market driven by consumerism and convenience, as well as the relatively low price of plastic materials (Nairobi, 2014).

Figure 11 European plastics production in Mtonne.

2.2.2 Effect of Plastic Pollution Towards Environmental

Environmental pollution definitions state that pollution occurs when harmful substances are introduced into the environment. Pollutants are these harmful substances. Pollutants can be organic substances, such as volcanic ash. They could also be the result of human activity, such as garbage or factory runoff. Pollutants harm the quality of the air, water, and land. Environmental pollution is the introduction of external pollutants into the environment. These pollutants are primarily produced by human activities such as transportation and industrialization. Pollution has a wide range of environmental consequences. (Mukheed & Khan, 2020).

Plastic pollution has become one of the most pressing environmental issues, as the world's ability to deal with it has been overwhelmed by the rapidly increasing production of disposable plastic products. Plastic pollution is most visible in developing Asian countries, where garbage collection systems are frequently inefficient or non-existent. However, the developed world, particularly in countries with low recycling rates, has difficulty properly collecting discarded plastics. Plastic waste has become so pervasive that efforts have been made by the United Nations to draught a global treaty. (Gaelle, 2015).

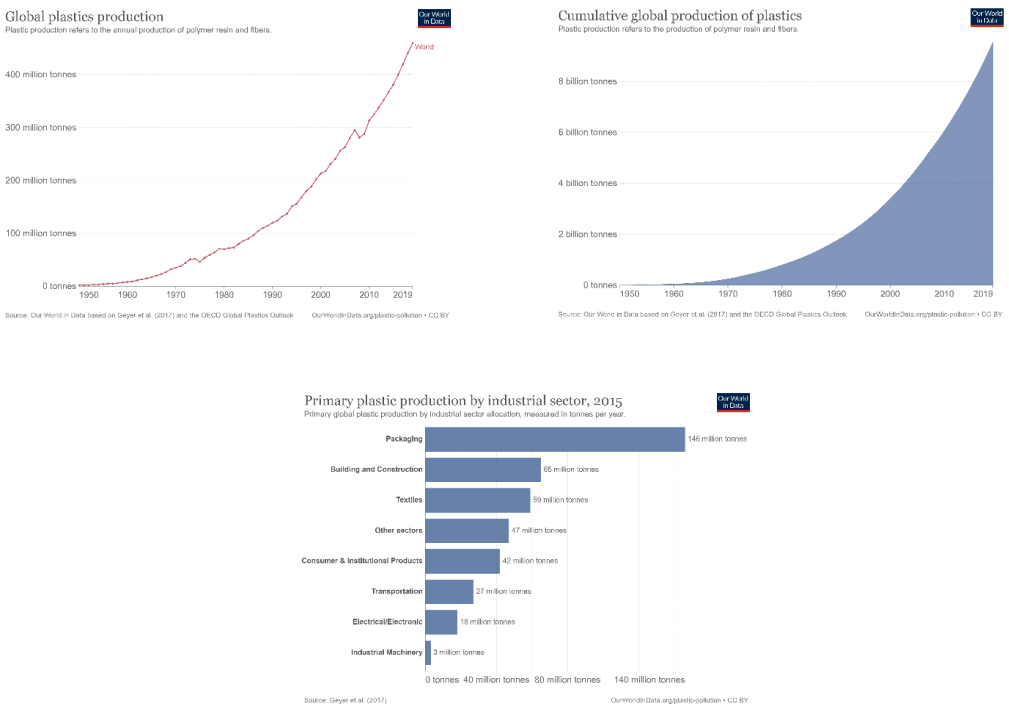


Figure 12 Plastic pollution, Our World in Data

Some key facts about plastic are in the last 15 years, half of all plastics produced have been manufactured. Production increased at an exponential rate from 2.3 million tonnes in 1950 to 448 million tonnes in 2015. Production is expected to double by 2050. Plastics frequently contain additives that increase their strength, flexibility, and durability. Many of these additives, however, have the potential to extend product life if they become litter, with some estimates ranging from 400 years to break down. Some 18 billion pounds of plastic waste flows into the oceans every year from coastal regions. Globally, we use 160,000 plastic bags every second. (Hannah, 2018).

Figure 13 Fast facts about plastic pollution, National Geographic

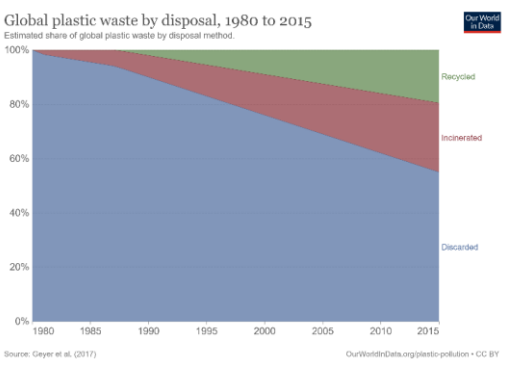


Figure 14 Global Plastic Waste by Disposal, Our World in Data

2.2.3 Marine Pollution

When toxic substances such as chemicals, plastic, and other waste enter our water resources, they cause water pollution. Chemicals from agricultural runoff, industrial waste, urban sewage, oil spills from boats, and so on could all be pollutants. Fresh water is a very valuable natural resource that must be kept clean at all costs. According to the Environment Protection Agency (EPA), 64% of lakes are unfit for activities such as fishing and swimming. This happen because the oceans have turned into a huge garbage dump for all kinds of plastics. Most of the plastic trash in the oceans, Earth's final sink, comes from land. Trash is also carried to sea by major rivers, which act as conveyor belts, picking up more and more trash as they move downstream. Once at sea, much of the plastic trash remains in coastal waters. However, once caught in ocean currents, it can be transported all over the world. (Mukheed & Khan, 2020).

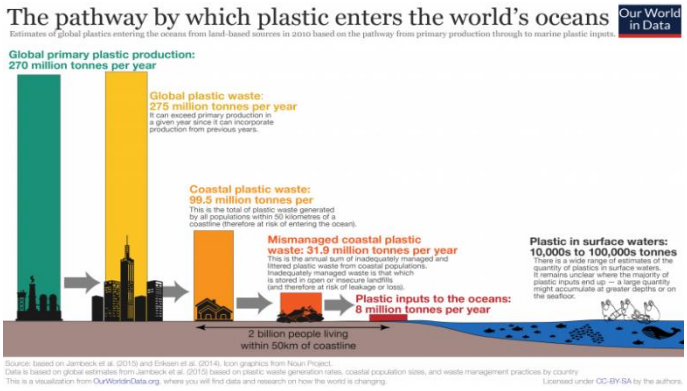


Figure 15 The pathway plastic enters world ocean, Our World in Data

Microplastics have been discovered in over 100 aquatic species, including fish, shrimp, and mussels. Megaplastic, macroplastic, mesoplastic, and micro-plastic are major plastic pollutants that can be classified based on size variations (Hannah, 2018). In many cases, these tiny bits pass through the digestive system and are expelled without consequence. However, plastics have been found to have blocked digestive tracts or pierced organs, resulting in death. Plastic-filled stomachs reduce the desire to eat, leading to starvation. Tests have also revealed liver and cell damage, as well as disruptions in reproductive systems, causing some species, such as oysters, to produce fewer eggs. New research indicates that larval fish consume nanofibers in their first days of life, raising new concerns about the effects of plastics on fish populations. Once at sea, sunlight, wind, and wave action degrade plastic waste. When plastic waste reaches the sea, sunlight, wind, and wave action break it down into small particles, often

less than one-fifth of an inch across. These so-called microplastics are found all over the world, from Mount Everest, the highest peak, to the Mariana Trench, the deepest trough. Microplastics are breaking down further into smaller and smaller pieces. Plastic microfibers, meanwhile, have been found in municipal drinking water systems and drifting through the air. (Thushari & Senevirathna, 2020).

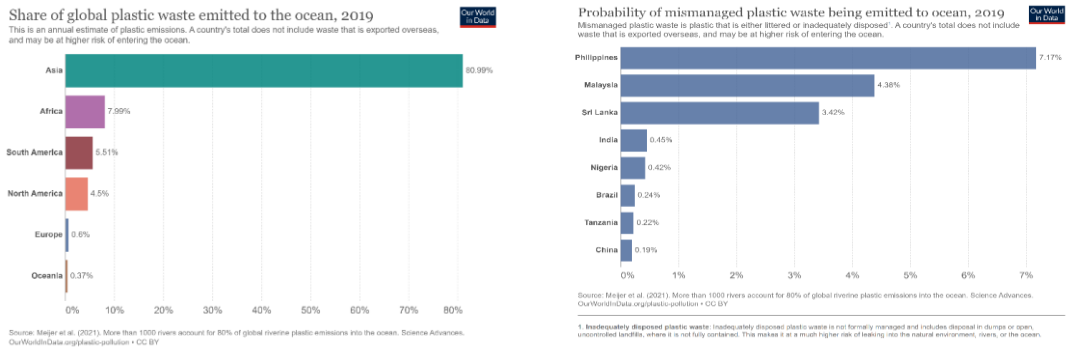


Figure 16 Malaysia is number 2 in the probability of mismanaged plastic waste being emitted to the ocean, Our World in Data

2.2.4 Air Pollution

Air pollution appears to be a mix of gases and solid particles in the atmosphere. Particulate matter can be stored by plants, automobiles, smoke, pollen, and mould spores. Open waste burning is common in many parts of the world and is a significant source of air pollution. Several plastics emit hazardous gases that can pollute and contaminate the air. (Verma et al., 2016). Most plastics are derived from fossil fuels like oil and natural gas, which emit toxic emissions when extracted from our planet. During oil and gas drilling, benzene, toluene, ethylbenzene, xylene, carbon monoxide, hydrogen sulphide, ozone, sulphur dioxide, particulate matter, and volatile organic compounds are all released into the air.

Oil refineries process crude oil into a variety of products, including plastic, and require several operational stages that emit dozens of pollutants, making our skies smokier, hazier, and more toxic to breathe while also contributing to global warming. When plastics are burned, a toxic cocktail of chemicals is released, endangering the health of the planet and those who breathe polluted air. One such serious pollutant is black carbon, which has a global warming

potential up to 5,000 times that of carbon dioxide. Production and burning of plastic would add 850 million metric tons of greenhouse gases to the atmosphere. (Adamu et al., 2020)

Figure 17 A fire burns at an illegal dumpsite in Port Klang Malaysia, Los Angeles Times

Figure 18 Burning plastic waste is a common practice among Indonesians, The Jakarta Post

Phthalates are chemicals added to plastic that provide structural properties such as flexibility and heat resistance. Because phthalates are not chemically bound to plastic, they can easily off-gas into the air and the products we use. We are all familiar with the distinct odour of a brand-new car interior, but this is due to phthalates off-gassing. According to research, many of the microplastics in our bodies come from the air we breathe. Microplastics can be inhaled due to their small size and are abundant in both indoor and outdoor air. Small particles in the bloodstream can cause cardiovascular and cerebrovascular diseases. Microplastics have been found in lung tissue and muscle tissue, demonstrating the substance's bio-persistence and the body's inability to eliminate it. (Mohammed & Mustafa, 2020).

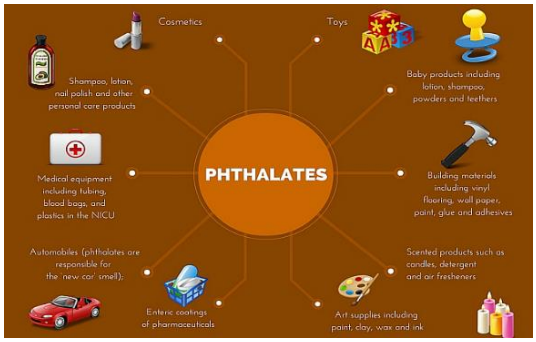


Figure 19 Phthalates, Phthalates Blog

2.2.5 Soil Pollution

Soil pollution may be defined as any chemical or pollutant that is harmful to living organisms. Pollutants degrade soil quality, disrupt the natural makeup of the soil, and cause soil erosion. The source of the contamination and its impact on the ecosystem define different types of soil pollution. Agricultural pollution, industrial waste, and urban activity are all examples of soil contamination. Industrial waste materials are responsible for approximately 90% of oil contamination. Improper trash disposal contaminates the soil with hazardous substances. When plastic bags are strewn on land, the soil becomes less productive. Plastic bags gradually emit hazardous substances that certain animals consume. (Valentina et al.,2019)

When plastic is burnt, it emits hazardous compounds that end up in the soil, surface water, and on plants. Chlorinated plastic may leach toxic chemicals into the soil, which can ultimately enter groundwater or other nearby water sources, as well as the ecology. This can have catastrophic consequences for the creatures that consume the water. Microplastics in agricultural soils may also make their way up the food chain and endanger human health. Certain plastics contain harmful compounds, and when they reach the water, they can accumulate and carry illnesses. (Eun Chae & Joo An, 2018)

Figure 20 Soils Pollution, Frontiers

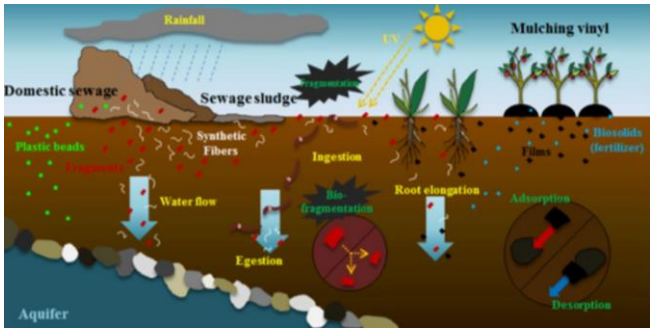


Figure 21 The flow of plastic wastes in the soil environment, Environmental Pollution

2.2.6 Effect plastic pollution toward human and animal

The first is the detrimental effect on human health. This is because humans consume plastic-contaminated fish. Microplastics have been discovered in 114 marine species, with approximately one-third of them ending up on our plates. Plastic is also used by humans in the form of packaging. BPA, which is found in many plastic objects that come into direct contact with food, is processed in the liver to generate Bisphenol A, which persists in the human body via urine. They consume microplastics via bottled water. In 2018, the WHO reported shocking study that demonstrated the presence of microplastics in 90% of bottled water, with only 17 plastic-free samples out of 259. People also absorb plastic through their clothing, 70% of which is synthetic and, worst of all, is harmful.

Not only that, but humans inhale plastic when garbage is burned in the open air due to poor waste management. Plastic pollution also has an impact on the food chain. The most significant pathways of human exposure to phthalates are medical exposures generated by the direct release of phthalates into the human body (Proshad R etal.,2017). This is since it occurs in both huge and small quantities, and it pollutes even the smallest species on the planet, such as plankton. When tiny creatures are poisoned because of consuming plastic, it poses problems for larger animals that rely on them for sustenance. This can lead to a variety of issues as the food chain progresses. Furthermore, this suggests that plastic is present in the fish that many people consume daily.

It can also pollute the soil and the air. When plastic is disposed of in a landfill, it reacts with water and produces hazardous compounds. When these pollutants seep into the earth, they contaminate the water. Wind transports and deposits plastic from one location to another,

contributing to an increase in land litter. It can also become entangled around poles, traffic lights, trees, fences, and towers, as well as animals that may come around and drown. Not only that but burning plastic in the open air pollutes the environment by releasing hazardous chemicals. When humans and animals breathe polluted air, it affects their health and can cause respiratory difficulties.

Because plastic can be harmful, plastic pollution can kill animals. Although countless TV commercials have portrayed ducks or dolphins trapped in six-ring plastic cans throughout the years, these objects are nonetheless used and discarded daily. Plastic pollution harms the world's ecosystems, whether because the mass of plastic has displaced wildlife or because the related poisons have poisoned them. Humans create plastic by hazardous chemicals. As a result, the usage and exposure to plastic has been connected to a range of health issues affecting individuals all over the world. Making, storing, disposing of, and even being around plastic may be extremely damaging to life. Nonetheless, it is crucial to realise that Thales is slightly less harmful to humans than BPA. As a result, BPA and thalates are present in all types of plastic containers (Proshad R etal.,2017).

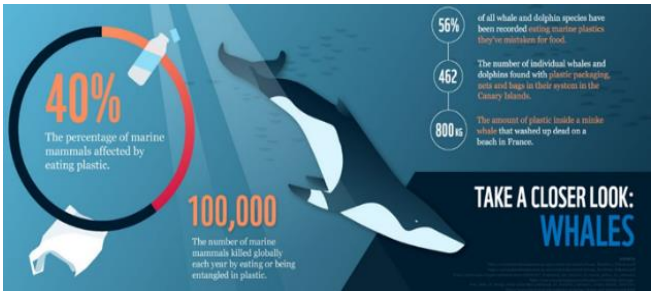


Figure 22 Take A Closer Look: Whales

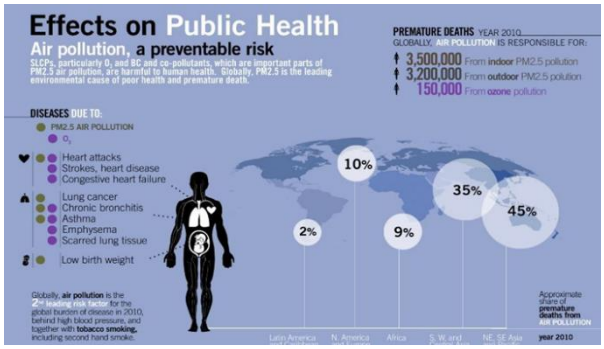


Figure 23 Effects on Public Health

ADDIE Model

ADDIE is a learning model used by instructional designers and training developers to create effective learning experiences. The term, ADDIE, is an acronym for a five-step process which are Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model was originally invented by Florida State University in 1975. Its purpose was to form an instructional systems development program for military training. (Dalibor D, Branko L, Zeljko S, Dragan C, 2012)

Figure 24 ADDIE Model, Training Development

2.2.1 Analyse

The instructional designer evaluates the job performance requirements and creates a task list for courses that directly tie the content to training a student to accomplish a job. The developer then assesses the job tasks and compares them to the incoming students' skills, knowledge, and abilities. What teaching is required is determined by the difference between what they already know and can do and what the work demands them to know and be able to perform. Formative evaluation activities commence (Allen W., 2006).

The Analyze phase serves as the foundation for all subsequent phases of instructional design. At this phase, the investigator defines the problem, finds the source of the problem, and determines potential solutions. Certain research methodologies such as need analysis, goal analysis, and task analysis may be used at this phase. This phase's output frequently includes instructional goals and a list of actions to be instructed. These results will be used as inputs in the Design phase. (Ganesan & Muruganantham, 2015).

2.2.2 Design

The Design phase involves planning a strategy for developing the instruction based on the results of the Analysis phase. This is the process of determining how the information will be learned. This step determines the development strategy based on the data obtained during the analysis phase and clarifies how the objectives will be met. In other words, it is the section in which the teaching method, learning activities, and evaluation process are made clear. The tasks are separated into learning steps during the analysis process, allowing the design to be implemented more accurately and easily. The approach should be methodical in this phase, with a logical, organized process of defining, creating, and assessing planned strategies targeted at attaining the project's objectives. (Ganesan & Muruganantham, 2015).

2.2.3 Develop

At this stage, we will begin to concentrate on producing and developing product based on the design we have created in the previous stage. Our main task is to turn plastic rice into a reusable product for society, which can prevent environmental pollution. In addition, testing is an important component of the work at this stage as it will help avoid damage to your project in the future. Plus, ensuring that your stakeholders are involved in a clear testing and review process. The utilization of plastic waste, especially in developing countries, is needed to avoid unnecessary energy use (Horvath, Balint, et al., 2018).

2.2.4 Implement

The fourth phase is the implementation phase, which is to practice and guarantee genuine fulfillment through tangible methods. This phase includes carrying out instructions, creating an instructional space, and preparing instructional materials. Instead of the waste will be collected by plastic waste collectors and given to the plastic recycling industry, (Hidayat, Yosi Agustina, et al.,2019), we implement the idea of using the plastic waste as a laundry bag. Consequently, the amount of plastic waste is increasing due to the increase in plastic consumption because of the increasing population (N. Wichai-utcha & O. Chavalparit, 2019). In this phase, we re-evaluate, modernize, and change courses to ensure effective delivery. "Procedures" is the keyword here. Here, we, as a team works together to learn new tools and continually evaluate designs for improvement. This is where a lot of the real work is done.

2.2.5 Evaluate

Evaluation is continuous quality checking. This is true during each phase of the ADDIE process, from analysis to evaluation (Allen et al., 2006). The ADDIE process is a cyclical, ongoing process of continuous improvement. As curriculum developers progress through the different phases of ADDIE, the process, and products of each phase are constantly evaluated against the instructional requirements and principles of learning (Allen et al., 2006). The evaluation may be Formative or Summative. Formative Evaluation is ongoing during and between phases and summative Evaluation usually occurs after the final version of instruction is implemented (Ganesan, 2015). The results of the evaluations determine which phase of the model to enter next. The constant evaluation identifies changes in instructional requirements due to updates in equipment and personnel, which results in new ADDIE efforts to provide the best possible instruction to personnel (Gagne et al., 2005).

The Benefits of Reducing Plastics to The Environment

The quality of life of humans is impacted by plastic waste. People's quality of life can be directly impacted by local pollution and air quality. At recycling facilities, a lack of technical health requirements exposes people and workers to a variety of contaminants, accidents, infections, and other serious health issues that lower life expectancy.

Plastics continue to benefit society in innumerable ways, even though recent public focus on plastics has centered mostly on human health and environmental concerns, including their endocrine-disrupting properties and the long-term pollution they represent. (Emily J. North and Rolf U. Halden, 2016). Why we should reduce the use of plastic is because it minimizes pollution and lowers the need for fossil fuel use, reducing the use of plastic is crucial for conserving energy and natural resources. Moreover, it lowers greenhouse gas emissions, which play a role in climate change.

During the last decade, climate warming has raised the global temperature by a few degrees. Most of this is attributable to carbon emissions from manufacturing enterprises and the use of fossil fuels. Because most of the plastic is manufactured using fossil fuels, emissions are released into the atmosphere. Oil is refined to provide the raw components needed in plastics. By minimizing plastic waste and consumption, firms who make those items will have

less demand, resulting in less plastic on the market. As a result, harmful carbon dioxide emissions that are warming the globe would be reduced.

In addition, plastic waste affects animals on land, in the air, and at sea, as we have seen on television and in the media. Turtles and fish frequently mistake plastic waste for food or become entangled in plastic bags, causing damage or death. Microplastics come up in the food we consume after animals eat plastic by mistake (Seth Kane a, et al., 2015). A bag or bottle might become caught on an animal's head, causing pain and suffocation. Therefore, they are just as susceptible to inadvertent eating as marine life. Reducing plastic waste helps wildlife by reducing the number of animals that are injured or killed.

Apart from improving human and environmental health, reducing plastic waste saves money. When we purchase a product wrapped in plastic, we are paying for both the goods and the plastic packaging. In addition, rather of throwing away plastic, we may reuse things like laundry bags made of plastic rice, which saves us money in the long run.

Figure 25 Pathways to tackling the plastic waste problem, The Japan Times

2.3 Conclusion

There are various types of pollution based on the activities that cause them; however, only humans could deal with all of them. It demanded that we take immediate responsibility for our environment and take the necessary precautions to prevent pollution. According to 21st-century environmental and safety-conscious behaviour, it is necessary to strive to reduce all activities that cause environmental damage in all aspects of life. Because of the increased

amount of waste caused by the penetration of plastics, more emphasis should be placed on recycling, waste management, and environmentally friendly solutions. Plastic manufacturing is a constantly growing industry, particularly packaging manufacturing, so the amount of plastic waste generated is also steadily increasing. Only a part of the accumulated waste is recycled, another part is destroyed, and the remaining amount will continue to pollute the environment. (Nagy & Kuti, 2016)

CHAPTER 3 METHODOLOGY

3.1 Introduction

This chapter examines project design, including project production processes, materials and equipment, data analysis methods, and a summary. Methodology is a component of data or information collection to attain research objectives.

3.2 Project Design

MOG Laundry bags are made from recycled plastic rice. Below are the steps that shows how the MOG laundry bag is designed and developed.

3.2.1 Project Production Methods/ Procedures/ Techniques

Rice plastic bag has been focused on in this study because of the increased amount of waste caused by the penetration of plastics, more emphasis should be placed on recycling, waste management, and environmentally friendly solutions. Therefore, this project will be a steppingstone for reducing plastic waste by designing and developing plastic-based laundry bags to support a greener world. This laundry bag is named as ‘My Own Green Laundry Bag’ in a short MOG laundry bag. The ADDIE instructional design framework was used to create and construct plastic-based laundry bags in this study. ADDIE is a learning model used by instructional designers and training developers to create effective learning experiences. The term, ADDIE, is an acronym for a five-step process which are Analysis, Design, Development, Implementation, and Evaluation

Analyse

Analyse the issue caused by plastic waste, which results in marine pollution, air pollution, and soil pollution. Both humans and animals are affected by all this pollution.

Design

Design an environmentally friendly product by using the thrown rice plastic bag which will help to reduce plastic waste and decrease pollution created by plastic waste.

Develop

We developed an environmentally friendly product using rice plastic to create laundry bags.

STEP 1

Figure 26 Cut the rice plastic's edges.

Firstly, cut off the plastic edges of the rice using scissors. The aim is to build the body of the MOG laundry bag.

STEP 2

Figure 27 Measure and cut the rice plastic into circles.

Second, measure and cut the rice plastic into rounds to serve as the base of the MOG laundry bag. A circle cut in medium size with a measure length and width is 31 cm.

STEP 3

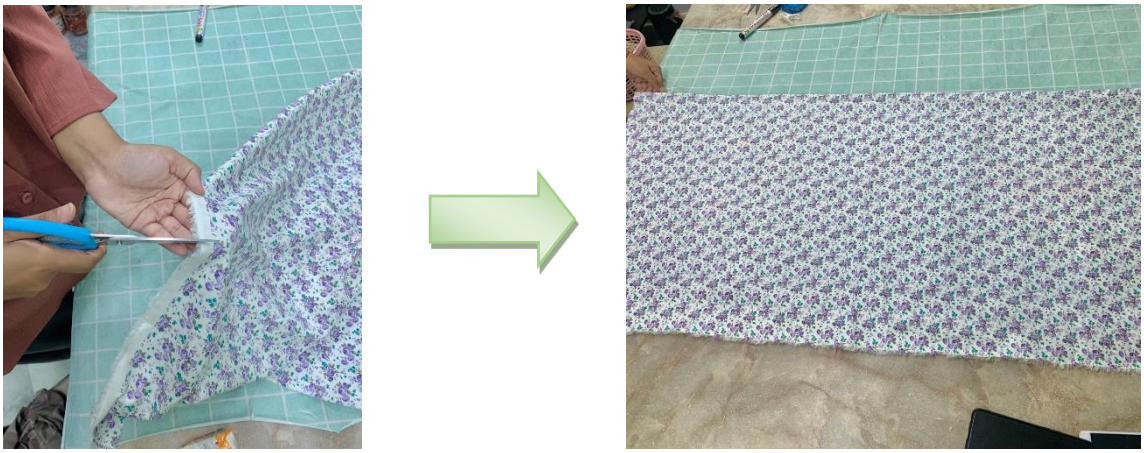


Figure 28 Fabric is cut according to the size of the rice plastic body.

Then, a cloth measuring 41 cm X 25 cm is cut to be sewn together with the main body of the MOG laundry bag.

STEP 4

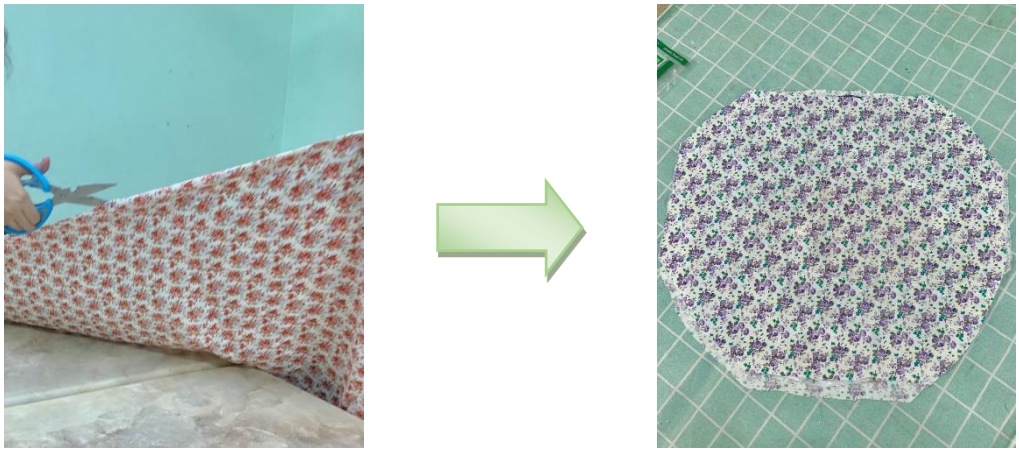


Figure 29 Fabric cut into rounds.

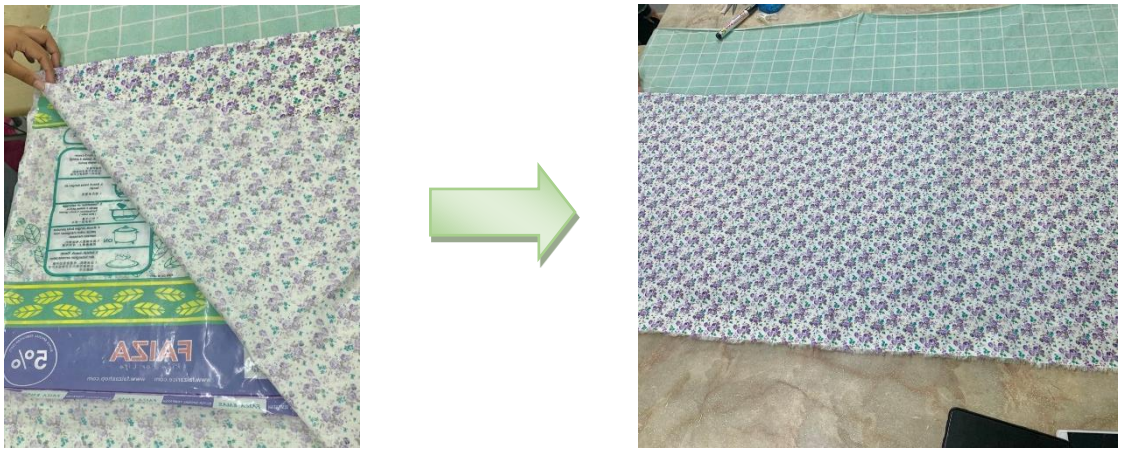
Again, the fabric is cut into a round look with a size of 31 cm in length and width. This fabric will be sewn together with the base of the cut MOG laundry bag.

STEP 5

Figure 30 Make a MOG laundry bag holder.

Next, make the MOG laundry bag holder. Rice plastic is cut straight and wrapped for sewing. The handle is wrapped so that it can support the weight and comfort when lifting the MOG laundry bag.

STEP 6



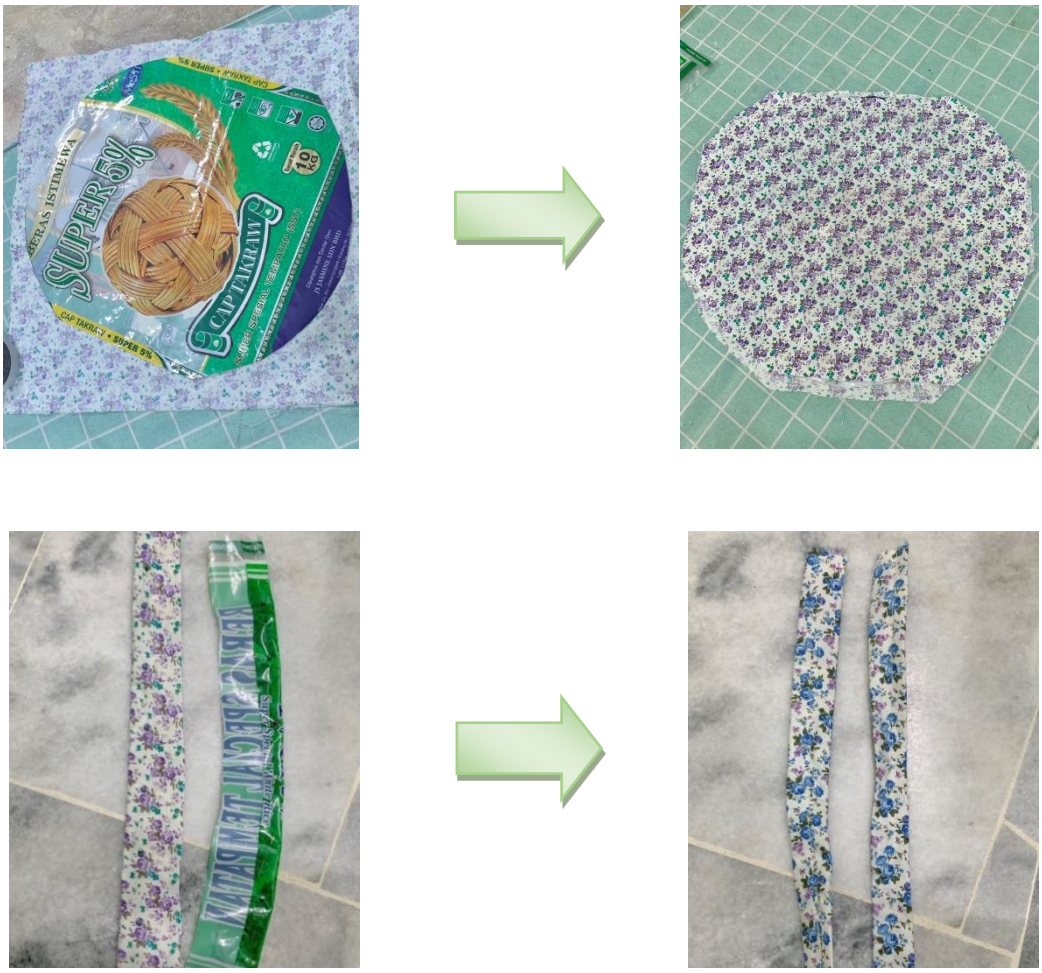


Figure 31 Body parts, base bag holders, and laundry are sewn together with fabric.

Then, the body parts, base, and laundry bag holders are sewn together with pre-measured fabric. Plastic and fabric are sewn using a sewing machine so that the seams are stronger and neater than sewing by hand.

STEP 7

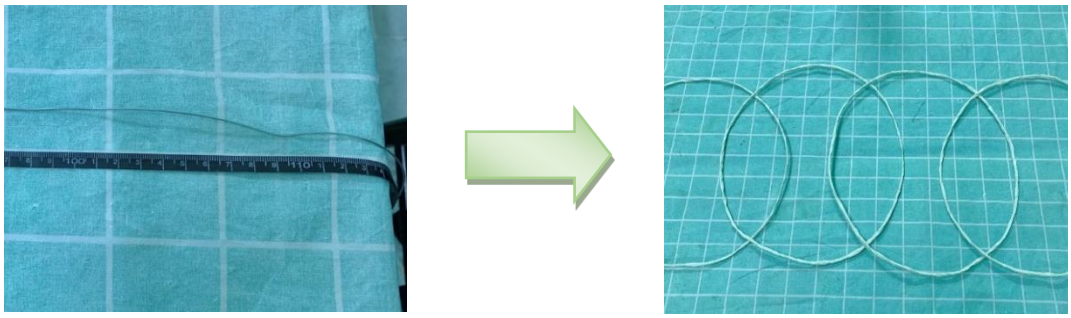


Figure 32 The wire is measured to be shaped into a round.

The wire measured with a length of 1 circumference is 110 cm. the wire is wrapped 3 times so that the circle is thicker. it is used as a support to MOG laundry bags.

STEP 8

Figure 33 Wire, body, base, and handles that have been sewn with fabric are sewn together.

Finally, the wires, bodies, base and handles that have been sewn with fabric, are combined to be sewn again. So, it will form into 1 complete MOG laundry bag.

Implement

This laundry bag is safe for users of all ages and does not harm them in any way. A user survey will be conducted to obtain feedback.

Evaluate

We will evaluate the effectiveness of environmentally friendly laundry bag by analysing the finding from the post survey questions.

3.2.2 Material and Equipment

Figure 34 Materials needed for making MOG laundry bag.

NAME OF MATERIAL	QUANTITY
 	• For each laundry bag need 3 rice plastic bags which is 10KG size • Total need 12 rice plastic bags

	• 150 cm of fabric for each laundry bag • 4 colours in same design
	• 110 cm iron wire needed for each laundry bag.
	• Scissors 1 unit • Measuring tape 1 unit • Sewing needle 1 unit • Sewing thread 1 unit

Figure 35 List of materials needed for making MOG laundry bag.

3.2.3 Method of Collecting Data

The actual data for this study came from our sample population, which includes students, the employed, the unemployed, and other people who use laundry bags. The data was collected using observation and survey methods to determine whether the product fulfils its purpose and objectives. We sent the link to the MOG laundry bag-related questionnaire to our closest relatives and friends and asked them to forward it to their contacts to reach the target of 30 respondents. If a respondent refused to complete our questionnaire, we distributed it to other respondents from the same sample group.

3.3 Summary

This chapter provides a clear overview of the overall research methodology. The implementation strategy of the MOG Laundry Bags project was used to create the project design. Material selection and design concept are just two of the many factors to consider when developing a project. As a result, this chapter explains and supports the validity of the research methodology used in this research project. The questionnaire is one of the most important research tools. This chapter clearly explains the different types of analyses and describes them. The main conclusions and findings of this dissertation are discussed in the following chapters.

CHAPTER 4 RESULT FINDINGS AND DISCUSSION

4.1 Introduction

This chapter is about data analysis. The data collection results were given as statistical analysis for easier comprehension using SPSS. SPSS is a software system designed for statistical analysis and data management. This system provides a wide range of statistical analysis procedures, including descriptive statistics. Through SPSS, it can assist us in data analysis by thoroughly analyzing and documenting the data we have collected before converting it to mean, percentage, and frequency values. The results of the data analysis entered SPSS system will be examined to evaluate the product of the respondent's responses.

4.2 Respondents Demographic Profile

The demographic profile of the respondent contains some personal data about the respondent. Basic inquiries about the respondents' gender, age, occupation, ethnicity, marital status, and income are at the demographic section. Besides that, the purpose of the questions was to learn about the MOG Laundry Bag. The employment question purpose is to identify which group most people fall into and if are they support the creation of plastic-based laundry bag which are name as MOG Laundry Bag. The respondent's response to the demographic section is shown in Table 36.

Table 36: Profile of Respondents (N=30)

Demography		Frequency	Percentage
Gender	Male	7	23.3
	Female	23	76.7
Age	Under 18	0	0
	18 – 27	17	56.7
	28 – 37	11	36.7
	38 – 47	2	6.6
	48 – 57	0	0
	Above 58	0	0
Ethnicity	Malay	19	63.3
	Chinese	4	13.4
	Indian	6	20.0
	Others	1	3.3
Occupation	Government sector	12	40.0
	Private sector	8	26.7
	Self – Employed	3	10.0
	Student	6	20.0
	Unemployed	1	3.3
Marital Status	Married	13	43.3
	Single	17	56.7
	Others (widow/widower)	0	0
Income	Below RM 1500	9	30.0
	RM 1501 – RM 2500	3	10.0
	RM 2501 – RM 3500	16	53.3
	RM 3501 and above	2	6.7

Table 36 shows the profile of the respondents from the survey. According to the results of the survey, there are 30 responses. There are 7 (23.3%) male respondents and 23 (76.7%) female respondents in our survey.

Based on the information provided by the respondents, our respondent range in age from 18 to 47, with no respondents under 18 or older than 47 years old. According to age group, most of the respondents are from the age group of 18 – 27 years old with a total number of 17 (56.7%) respondents. This is followed by the age group of 28 – 37 years old with a total number of 11 (36.7%) respondents. The least number of respondents are in the age group of 38 – 47 years old with a total number of 2 (6.6%) respondents.

With a total of 19 (63.3%) responses, Malays make up the majority of respondents by race. The second-highest respondent race is Indian, with 6 (20.0%) respondents, followed by Chinese with 4 (13.4%) respondents and other races with 1 (3.3%) respondent.

According to occupation, most of the respondents are employed and work in the government sector with a total of 12 (40.0%) respondents, followed by the second highest total of 8 (26.7 %) respondents, which work in the private sector. Next, the third highest are students with 6 (20.0%) respondents, followed by respondents who are self-employed, with a frequency number of 3 (10.0%). Finally, respondents who are unemployed scored 1 (3.3%).

According to marital status, most of the respondents are single with a total of 17 (56.7%) respondents and married respondents are 13 (43.3%). There are no respondents who are widow or widowers.

Lastly, based on the income level most of the respondent's incomes are between RM2501 – RM3500 with a total of 16 (53.3%) respondents. There are 9 (30.0%) respondents, who have income below RM1500. The next income level is RM1501 – RM2500 with a total of 3 (10.0%) respondents. There are 2 (6.7%) respondents who have an income of RM3501 and above.

4.3 Screening Section

Table 37: Would you be willing to purchase a product made from waste?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	30	100.0	100.0	100.0

Table 37 shows the screening section from the survey. According to the results of the survey, we received 30 responses. Overall, 30 (100%) respondents were willing to purchase a product made of plastic waste.

Table 38: When you compare the quality of recycled products with regular products do you think they are?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Better	3	10.0	10.0	10.0
	Equal	27	90.0	90.0	100.0
	Total	30	100.0	100.0	

As for table 38 above, it shows that 27 (90%) respondents state that the quality is equal between recycled products and regular products. Also, 3 (10%) respondents state that the quality of recycled products is better.

Table 39: How available for you are recycled products compared to regular products?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Available	2	6.7	6.7	6.7
	Available	28	93.3	93.3	100.0
	Total	30	100.0	100.0	

Lastly, with a total of 28 (93.3%) respondents choose available for the question how available for you are recycled products compared to regular products and 2 (6.7%) respondents state that there are not available recycled products compared to regular products.

4.4 Descriptive Statistics for Variable

Descriptive statistics were calculated for each item and variable to investigate their level among respondents. The five categories according to the mean consist of very low (1.00–1.80), low (1.81–2.60), medium (2.61–3.20), high (3.21–4.20), and very high (4.21–5.00). The data source is Moidunny (2009)

4.4.1 Environment Aspects

Table 40: I agree to use the MOG laundry bag to replace the normal laundry bag if it is available on the market.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	18	60.0	60.0	60.0
	Strongly Agree	12	40.0	40.0	100.0
	Total	30	100.0	100.0	

Table 41: I agree MOG Laundry Bag help reduce plastic waste.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	15	50.0	50.0	50.0
	Strongly Agree	15	50.0	50.0	100.0
	Total	30	100.0	100.0	

Table 42: I agree that this laundry bag can help reduce environmental pollution compared to other laundry bags that are available on the market today.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	16	53.3	53.3	53.3
	Strongly Agree	14	46.7	46.7	100.0
	Total	30	100.0	100.0	

Table 43: This MOG laundry bag is eco-friendly.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	13	43.3	43.3	43.3
	Strongly Agree	17	56.7	56.7	100.0
	Total	30	100.0	100.0	

Table 44: I agree to recommend the MOG laundry bag to other people.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	3	10.0	10.0	10.0
	Agree	15	50.0	50.0	60.0
	Strongly Agree	12	40.0	40.0	100.0
	Total	30	100.0	100.0	

Table 45: Descriptive Statistics for Environment Aspects (N=30, Mean = 4.4467)

	N	Mean	Std. Deviation
I agree to use the MOG laundry bag to replace the normal laundry bag if it is available on the market.	30	4.40	.498
I agree MOG laundry bag help reduce plastic waste.	30	4.50	.509
I agree that this laundry bag can help reduce environmental pollution compared to other laundry bags that are available on the market today.	30	4.47	.507
This MOG laundry bag is eco-friendly.	30	4.57	.504
I agree to recommend MOG laundry bags to other people.	30	4.30	.651
Environment Aspects	30	4.4467	.41251

Based on Table 45, which shows descriptive statistics for environmental aspects, Overall, the environmental aspect of the MOG laundry bag is at a very high level (mean = 4.4467) with a standard deviation of 0.41251. The item that is at the highest level in the environmental aspect is "This MOG laundry bag is eco-friendly" (mean = 4.57) followed by "I agree MOG laundry bag help reduce plastic waste." (mean = 4.50). The third level position falls to "I agree that this laundry bag can help reduce environmental pollution compared to other laundry bags that are available on the market today" (mean = 4.47); the fourth level is "I agree to use the MOG laundry bag to replace the normal laundry bag if it is available on the market" (mean = 4.40); and the lowest item falls to "I agree to recommend MOG laundry bags to other people" (mean = 4.30).

Table 45 above shows that all environmental aspects are very high. This is because the MOG laundry bag is suitable for the environment as the products are environmentally friendly. The MOG laundry products help lessen the environmental impact of single-use plastic bags is the environmental aspect that we place the highest priority on. Our goal with the MOG laundry bag product has been effectively met since we are able to reduce the amount of plastic waste through the MOG laundry bag. Our innovations are goods that can be cost-effective while benefiting the environment.

4.4.2 Design Aspects

Table 46: The material of the product used is appropriate.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	18	60.0	60.0	60.0
	Strongly Agree	12	40.0	40.0	100.0
	Total	30	100.0	100.0	

Table 47: The colour of the product is suitable.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	1	3.3	3.3	3.3
	Agree	21	70.0	70.0	73.3
	Strongly Agree	8	26.7	26.7	100.0
	Total	30	100.0	100.0	

Table 48: The MOG laundry bag size is suitable.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	19	63.3	63.3	63.3
	Strongly Agree	11	36.7	36.7	100.0
	Total	30	100.0	100.0	

Table 49: Descriptive Statistics for Design Aspects (N=30, Mean = 4.3333)

	N	Mean	Std. Deviation
The material of the product used is appropriate.	30	4.40	.498
The colour of the product is suitable.	30	4.23	.504
The MOG laundry bag size is suitable.	30	4.37	.490
Design Aspects	30	4.3333	.40115

The descriptive statistics for the design aspects are shown in Table 49. MOG Laundry Bag design quality is at a high level (mean = 4.333) with a standard deviation of 0.40115. "The material of the product used is appropriate" (mean = 4.40) is the item with the highest level in the design aspect, followed by "The MOG laundry bag size is suitable (mean = 4.37). The lowest item in design aspects is "The colour of the product is suitable" (mean = 4.23).

As shown in Table 49 above, all aspects of the design are at a high level. This is because MOG Laundry Bag is an innovative product that is developed using rice plastic bags. All the respondents strongly agreed with the item "The material of the product used is appropriate" because the laundry bag was made of rice plastic bag which is a strong item and has a good durability of up to 10 KG. MOG Laundry Bag is also very safe for users of all ages and does not harm them in any way and it is an environmentally friendly product. The MOG Laundry Bag has a floral theme that comes in different colours. This theme brings benefits to the users because the floral theme promotes peaceful relaxation. Florals have been shown to trigger the release of feel-good chemicals that help people to unwind.

4.4.3 Applicability Aspects

Table 50: MOG laundry bag is very valuable.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	15	50.0	50.0	50.0
	Strongly Agree	15	50.0	50.0	100.0
	Total	30	100.0	100.0	

Table 51: MOG laundry bag is very useful.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	14	46.7	46.7	46.7
	Strongly Agree	16	53.3	53.3	100.0
	Total	30	100.0	100.0	

Table 52: This product very well meets my needs.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	2	6.7	6.7	6.7
	Agree	16	53.3	53.3	60.0
	Strongly Agree	12	40.0	40.0	100.0
	Total	30	100.0	100.0	

Table 53: MOG laundry bag is safe to use.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	14	46.7	46.7	46.7
	Strongly Agree	16	53.3	53.3	100.0
	Total	30	100.0	100.0	

Table 54: I am very satisfied that this product was developed.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	15	50.0	50.0	50.0
	Strongly Agree	15	50.0	50.0	100.0
	Total	30	100.0	100.0	

Table 55: Descriptive Statistics for Applicability Aspects (N=30, Mean = 4.4800)

	N	Mean	Std. Deviation
MOG laundry bag is very valuable.	30	4.50	.509
MOG laundry bag is very useful.	30	4.53	.507
This product very well meets my needs.	30	4.33	.606
MOG laundry bag is safe to use.	30	4.53	.507
I am very satisfied that this product was developed.	30	4.50	.509
Applicability Aspects	30	4.4800	.44443

Table 55 displays the descriptive statistics for the applicability aspect. The applicability aspect of MOG's Laundry Bag is at a very high level (mean=4.4800) with a standard deviation of 0.44443. "MOG laundry bag is very useful" and "MOG laundry bag is safe to use" (mean = 4.53) is the item with the highest level in the design aspect, followed by "MOG laundry bag is very valuable " and "I am very satisfied that this product was developed" (mean = 4.50). The lowest item in design aspects is "This product very well meets my needs" (mean = 4.33).

As shown in Table 55 above, all applicability aspects are at a high level. MOG Laundry Bag is a very helpful product for consumers who use laundry bags and wish to reduce plastic waste, which is why it is mentioned. Customers that use normal laundry bags are strongly encouraged to use MOG Laundry bag products. This is due to MOG's ability to address the issue of plastic's challenging disposal. For information, the substance we use is rice plastic and all natural, safe for the environment. Additionally, MOG's size makes it incredibly simple to transport. MOG laundry bag is also made without the use of any chemicals. As a result, the MOG laundry bag is suitable to use for all people.

Table 56: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Environment Aspects	30	4.00	5.00	4.4467	.41251
Design Aspects	30	4.00	5.00	4.3333	.40115
Applicability Aspects	30	4.00	5.00	4.4800	.44443

Table 56 shows descriptive statistics for environment aspects, design aspects, and applicability aspects. For environment aspects of the MOG laundry bag is at a high level (mean = 4.4467) and the MOG Laundry Bag design aspects are at a high level (mean = 4.3333). Lastly, applicability aspects are at a very high level (mean = 4.4800). Overall, the mean is at a very high level.

4.5 DISCUSSION

Based on Table 45, it can be concluded that the results on the descriptive statistics for environment aspects received a high score. This is because MOG Laundry Bag is an environmentally friendly invention. The environmental benefit that we prioritize most is the way that MOG laundry products help reduce the negative effects of single-use plastic bags. Our innovations are goods that can be cost-effective while benefiting the environment. MOG Laundry Bag can lessen Malaysia's plastic pollution which leads to pollution such as air pollution, water pollution, and soil pollution. In conclusion, the design and development of this MOG Laundry Bag will lead to a greener world and the laundry bag have a positive impact on the respondents.

Following that, based on Table 49, which displays the descriptive statistics for the design aspects, there has been a positive response and a high level. This is because MOG Laundry Bag was developed using rice plastic bags. MOG Laundry Bag is a strong item and has good durability of up to 10 KG. In addition, it is a very safe product for consumers of all ages. As you are already aware, rice plastic is the major component of the MOG Laundry Bag. Because of its many advantages and potential to decrease plastic waste, MOG Laundry Bag is widely regarded as the best material for use in laundry bags. This demonstrates how the MOG

Laundry Bag product is seen as being extremely practical for daily usage as a different option to reduce plastic waste.

The findings in Table 55 suggest that MOG Laundry Bag satisfies their need to prevent plastic rice waste. The respondent is completely safe for this purpose even though they were reset and denied. Since it looks like any ordinary laundry bag, this gadget is small and portable. As a result, customers of MOG Laundry Bag products can profit from them on Earth. Thanks to the MOG Laundry Bag, which recycles used rice plastic, Malaysia will soon be able to fight the problem of discarded plastic.

4.6 SUMMARY

The chapter's conclusion paints a comprehensive picture of the research findings and the whole data analysis. To gather details and justifications about the data analysis, which were subsequently included in the table and discussed in this chapter, we created a questionnaire that we distributed to students at the Sultan Salahuddin Abdul Aziz Shah Polytechnic as well as other users.

CHAPTER 5 CONCLUSION AND RECOMMENDATION

5.1 Introduction

In this chapter, the overall effectiveness of our project, My Own Green Laundry Bag (MOG laundry bag) will be examined. Other than that, based on the evaluation of our sample group, we will decide whether its objective has been achieved. In addition, we will also list all the limitations while creating the MOG laundry bag. Lastly, to improve the sample we developed going forward, we would provide recommendations for our product as a final yet crucial step.

5.2 Conclusion

Plastics are one of the most widely used materials since they are derived from synthetic organic polymers and are strong, light, versatile, and relatively inexpensive to produce. Plastic pollution has become one of the most pressing environmental issues, as the world's ability to deal with it has been overwhelmed by the rapidly increasing production of disposable plastic products. As a result, the MOG Laundry Bag initiative can contribute to reducing the growth of the plastic waste problem. This project will be a stepping-stone for reducing plastic waste by the design and development of plastic-based laundry bags to support a greener world.

In conclusion, one of our project objectives is to design and develop the MOG laundry bag. The goal is to create an eco-friendly product to reduce plastic waste. The second objective of our project is to implement and evaluate the effectiveness of laundry bags in the community. These objectives are successfully achieved.

The first objective of our project is to design and develop a MOG laundry bag. For your information, MOG Laundry Bag is an eco-friendly product made from thrown rice plastic bags. Rice plastic bag has been focused on in this study because of the increased amount of waste caused by the penetration of plastics, more emphasis should be placed on recycling, waste management, and environmentally friendly solutions. Therefore, this project will be a stepping-

stone for reducing plastic waste by designing and developing plastic-based laundry bags to support a greener world.

According to our survey, 50% of the 30 respondents strongly agree that MOG Laundry Bag help reduce plastic waste while 50% agree with the statement. Thus, the design and development of the MOG Laundry Bag provide some help in the reduction of plastic waste pollution.

The second objective of our project is to implement and evaluate the effectiveness of laundry bags in the community. During the development process, we use ADDIE Model to create and evaluate the product. We were able to analyze the effectiveness and understand consumer feedback from our provided survey. Based on the survey, 50% of respondents strongly agree that our MOG Laundry Bag is very valuable. Next, 60% of respondents agree to use a MOG laundry bag to replace normal laundry bags if it is available on the market. Moreover, 40% of the respondents strongly agree to recommend MOG Laundry Bag to other people and 50% of the respondents agree with the statement. Hence, this shows that our product meets the objective of the study.

In conclusion, we can effectively reduce the amount of plastic waste with our MOG laundry bag, so our goal with the product has been accomplished. Our innovations are economical and have positive environmental effects. Finally, we hope that our product can be improved and marketed in the future to benefit the community and the environment.

5.3 Recommendation

According to the recommendations from our sample of users and our group members, we discovered that there are some improvements that we can make to our product to become even better in the future. All the suggestions have been considered, and we believe that by evaluating these ideas we can better help us to improve this product further in the future, which will benefit them.

The first recommendation that we can take into consideration is making our MOG laundry bag waterproof by changing the material of our cover body instead of using normal cloth. This recommendation is important as it has a significant impact on the success or failure of this product. In our studies, we tried to use plastic as a cover instead of normal cloth. However, we faced challenges during the sewing process as the plastic often came off and failed to stick to each other.

Therefore, to create a better sample in the future, we suggest using another type of cloth that is more suitable. Besides, the colour and design of the MOG Laundry bag is the second suggestion that we received. During the developing process, we try using various colour other than the colours that we already proceed. According to our studies, it makes our MOG laundry bags more attractive in designs and colours to buy. In short, we conclude that having multiple choices of design and colours is a better decision for our MOG laundry bag to become more attractive. Finally, we consider all kinds of suggestions for our product regardless of whether it is negative or positive. We appreciate the valuable feedback that our sample of users has provided. We are excited to make further improvements to our product to better fulfil the needs of our users in the future.

5.4 Limitation

Due to the nature of developing a successful product, there will always be pros and cons. Therefore, for our product, there are some limitations that occur throughout the process, and we can see that it can have some changes that can happen and maybe improve the effect of using our product, MOG Laundry Bag. Here are some of the limitations listed:

1. Limitation in manufacturing cost.
2. Limited lack of tools and materials.

The first restriction stated concerns rice plastic's durability. We are aware that there will be a market for our goods in the future due to the growing demand, but the price of using plastic rice is high because the manufacturing process calls for more than one plastic bag. Because of the current economic crisis, rice is becoming more expensive.

Finally, the tools and materials we use are our limitations. It takes a talented designer to create this product so that our design team can use and commercialize it with greater professionalism. Additionally, every material needed to make this product must be purchased at the same time. Each team member must also have sewing skills because it is difficult to manufacture them if you rely solely on one individual. It also takes a while to create since precise cutting, joining, and sewing is required to achieve a high-quality product.

5.5 Summary

As a summary of our project, which is referred to as the "MOG laundry bag," we can state that all the objectives that have been stated and detailed above have been met, as shown by the positive feedback we have received from a sample of the group who tried our product. According to our prediction, we have developed a solution to reduce plastic waste. Therefore, we developed the MOG laundry bag where rice plastic bags are the primary material. To conclude, the My Own Green Laundry Bag (MOG laundry bag) project aims to reduce plastic waste occurring while also protecting the environment.

REFERENCE

1. Van, L., Hamid, N. A., Ahmad, M. F., Aizat Ahmad, A. N., Ruslan, R., & Muhamad Tamyez, P. F. (2021).
   Factors of single use plastic reduction behavioral intention. *Emerging Science Journal*, *5*(3), 269–278. https://doi.org/10.28991/esj-2021-01275

2. Chen, H. L., Nath, T. K., Chong, S., Foo, V., Gibbins, C., & Lechner, A. M. (2021).
   The plastic waste problem in Malaysia: management, recycling and disposal of local and global plastic waste. In *SN Applied Sciences* (Vol. 3, Issue 4). Springer Nature. https://doi.org/10.1007/s42452-021-04234-y

3. Okunola A, A., Kehinde I, O., Oluwaseun, A., & Olufiropo E, A. (2019).
   Public and Environmental Health Effects of Plastic Wastes Disposal: A Review. *Journal of Toxicology and Risk Assessment*, *5*(2). https://doi.org/10.23937/2572-4061.1510021

4. Leiber, T., Stensaker, B., & Harvey, L. C. (2018).
   Bridging theory and practice of impact evaluation of quality management in higher education institutions: a SWOT analysis. *European Journal of Higher Education*, *8*(3), 351–365. https://doi.org/10.1080/21568235.2018.1474782

5. Mukheed, M., & Khan, A. (2020).
   Plastic Pollution in Pakistan: Environmental and Health Implications. *J Pollut Eff Cont*, *8*(4), 251. https://doi.org/10.35248/2375-4397.20.8.251

6. Verma, R., Vinoda, K. S., Papireddy, M., & Gowda, A. N. S. (2016).
   Toxic Pollutants from Plastic Waste- A Review. *Procedia Environmental Sciences*, *35*, 701–708. https://doi.org/10.1016/j.proenv.2016.07.069

7. Chae, Y., & An, Y. J. (2018).
   Current research trends on plastic pollution and ecological impacts on the soil ecosystem: A review. In *Environmental Pollution* (Vol. 240, pp. 387–395). Elsevier Ltd. https://doi.org/10.1016/j.envpol.2018.05.008

8. Ramasamy, R., & Murugan, M. (2022).
   Microplastics: Distribution, Isolation, Detection, and Effects on Flora and Fauna – A Mini Review. *World Journal of Environmental Biosciences*, *11*(4), 1–8. https://doi.org/10.51847/93t7fjrzku

9. Raudhah, N., Nirwandy, I. N., & Noordin, M. (2020).
   Understanding the Issue of Plastic Waste Pollution in Malaysia: A Case for Human Security. In *Journal of Media and Information Warfare* (Vol. 13, Issue 1).

10. Shershneva, E. G. (2021).
Plastic Waste: Global Impact and Ways to Reduce Environmental Harm. *IOP Conference Series: Materials Science and Engineering*, *1079*(6), 062047. https://doi.org/10.1088/1757-899x/1079/6/062047

11. Godswill, C., & Gospel, C. (2019).
Impacts of plastic pollution on the sustainability of seafood value chain and human health. In *International Journal of Advanced Academic Research | Sciences* (Vol. 5, Issue 11).

12. Hidayat, Y. A., Kiranamahsa, S., & Zamal, M. A. (2019).
A study of plastic waste management effectiveness in Indonesia industries. *AIMS Energy*, *7*(3), 350–370. https://doi.org/10.3934/ENERGY.2019.3.350

13. M., & Muruganantham, G. (2015).
Impact Factor: 3.4 IJAR. *1*(3), 52–54. www.allresearchjournal.com

14. Horvath, B., Mallinguh, E., & Fogarassy, C. (2018).
Designing Business Solutions for plastic waste management to enhance circular transitions in Kenya. *Sustainability (Switzerland)*, *10*(5). https://doi.org/10.3390/su10051664

15. Nagy, Á., & Kuti, R. (2016).
The Environmental Impact of Plastic Waste Incineration. *Academic and Applied Research in Military and Public Management Science*, *15*(3), 231–237. https://doi.org/10.32565/aarms.2016.3.3

16. Godswill, C., & Gospel, C. (2019).
Impacts Of Plastic Pollution on The Sustainability of Seafood Value Chain and Human Health. In *International Journal of Advanced Academic Research | Sciences* (Vol. 5, Issue 11).

17. Nikolaou, E. I., Ierapetritis, D., & Tsagarakis, K. P. (2011).
An evaluation of the prospects of green entrepreneurship development using a SWOT analysis. *International Journal of Sustainable Development and World Ecology*, *18*(1), 1–16. https://doi.org/10.1080/13504509.2011.543565

18. Khoo, K. S., Ho, L. Y., Lim, H. R., Leong, H. Y., & Chew, K. W. (2021).
Plastic waste associated with the COVID-19 pandemic: Crisis or opportunity? *Journal of Hazardous Materials*, *417*. https://doi.org/10.1016/j.jhazmat.2021.126108

19. Shams, M., Alam, I., & Mahbub, M. S. (2021).
Plastic Pollution During COVID-19: Plastic Waste Directives and Its Long-term Impact on The Environment. In *Environmental Advances* (Vol. 5). Elsevier Ltd. https://doi.org/10.1016/j.envadv.2021.100119

20. Klemeš, J. J., Fan, Y. van, Tan, R. R., & Jiang, P. (2020).
Minimising the present and future plastic waste, energy and environmental footprints related to COVID-19. *Renewable and Sustainable Energy Reviews*, *127*. https://doi.org/10.1016/j.rser.2020.109883

21. Asmuni, S., Hussin, N. B., Khalili, J. Mhd., & Zain, Z. M. (2015).
Public Participation and Effectiveness of the no Plastic Bag Day Program in Malaysia. *Procedia - Social and Behavioral Sciences*, *168*, 328–340. https://doi.org/10.1016/j.sbspro.2014.10.238

22. Kuan Shiong Khooa,b, Lih Yiing Hob, Hooi Ren Limb, & Kit Wayne C (2021)
Plastic waste associated with the COVID-19 pandemic: Crisis or opportunity? www.elsevier.com/locate/jhazmat https://doi.org/10.1016/j.jhazmat.2021.126108

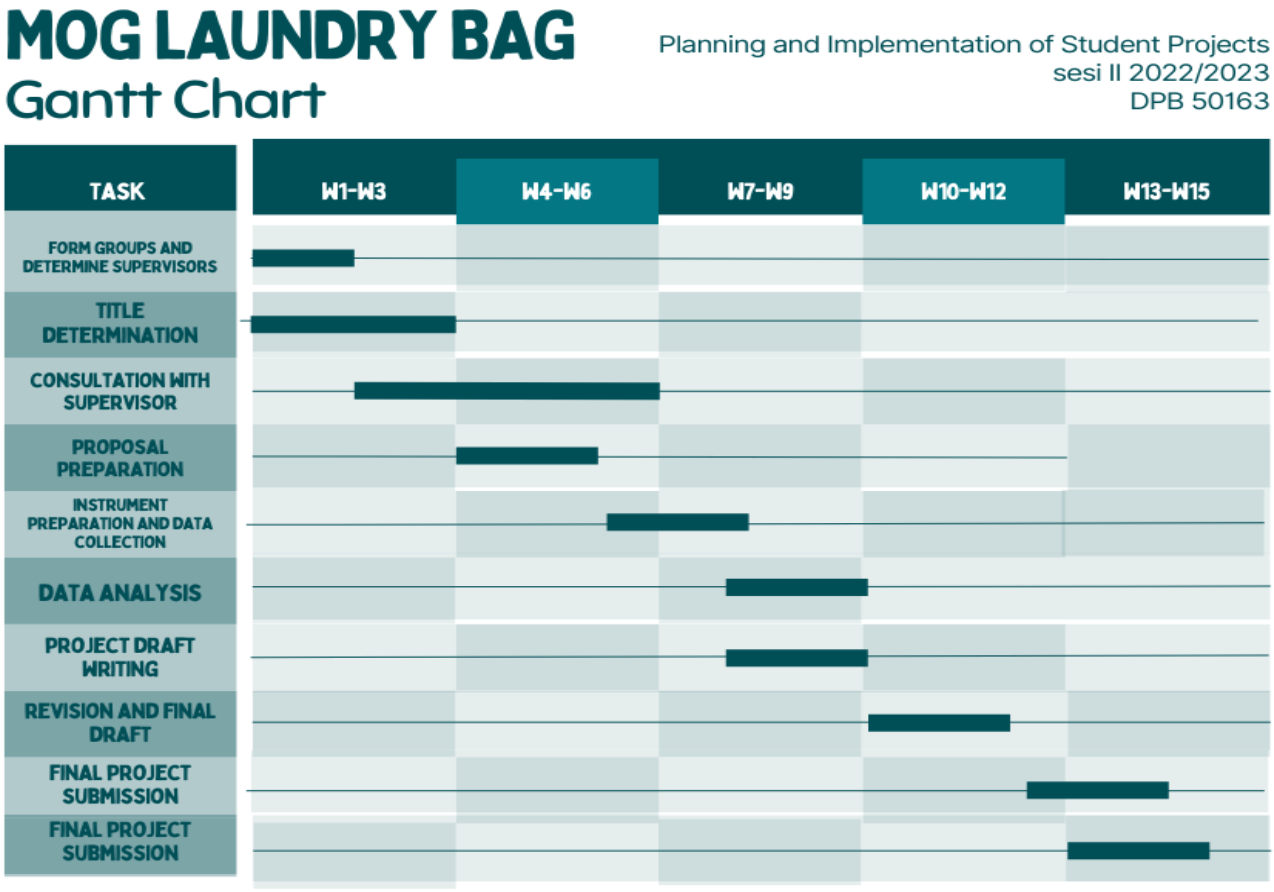
23. Ahsan M, Nasir M, Abbas J (2020)
Examining the Causes of Plastic Bags Usages and Public Perception about its Effects on the Natural Environment. http://dx.doi.org/10.6007/IJARBSS/v10-i10/7919

APPENDICES

APPENDIX A: Gantt Chart

APPENDIX B: Project Total Cost

i. APPENDIX A: Gantt Chart



ii. APPENDIX B: Project Total Cost

ITEMS	QUANTITY	COST PER UNIT (RM)	TOTAL COST (RM)
Rice Plastic Bags	12	-	-
Fabric	6 meters	6 per meter	36
Iron wire	2	2.80	5.6
Scissors	1	-	-
Measuring Tape	1	-	-
Sewing Needle	1	2	2
Sewing Thread	1	5	5
		TOTAL COST	**RM 48.60**