

**RECYCLABLE PLASTIC ROPE (RPR): THE ACCEPTANCE AMONG STUDENTS
 IN DEPARTMENT OF TOURISM AND HOSPITALITY, POLITEKNIK
 MERLIMAU MELAKA**

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ABSTRACT

The dumping of disposal plastic bottle are booming especially in food industry. Furthermore, it gives high impact to the landfill waste space, pollution, cost and energy. Therefore, the study had been conducted to create a Recyclable Plastic Rope (RPR) in order to decrease or minimize the impact to the environment. The study also focused on the acceptance of RPR among students in Department of Tourism and Hospitality, Politeknik Merlimau Melaka. Methodologies of producing RPR and the production cost have been stated in the study. The acceptance study of RPR is based on its characteristics; which are portable, sustainability of the resources, durability towards weather and heavy load, multipurpose function, creativity and uniqueness, variety types of bonds, stretchable and the supportive effort to protect the environment. The result showed that most of the respondents strongly accepted the function of RPR as an alternative rope.

Keywords: *recyclable, rope, acceptance*

INTRODUCTION

Nowadays, there are so much wastage of bottles in the industry, especially in food service industry. The wastage of the bottles can cause negative impact to the environment. Thus, the study been conducted to overcome the problem of wastage plastic bottle, we suggest to make rope from recycle plastic bottle.

| Jute | Wool | RPR |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |
| Made from the bark of the white jute plant and the tossa jute plant | 100% wool fibres, wrapped around a burlap cord | 100% plastic bottle |
| It absorb and retains moisture | It provides comfortable warmth | It resistant to weather change |

Figure 1.1: Characteristic between Three Types of Rope

BACKGROUND OF STUDY

1. The problem of increasing the dumping plastic bottle used in the industry and disposal waste.
2. Food and beverages product based on plastic bottle material from industrial market, restaurant, retail store and kitchen department.
3. Using of plastic bottles product non-stop by the consumer which do not practice recycle concept.

4. Consumer do not know the effect of disposal of plastic bottles can cause a significant problem towards the earth.

RESEARCH BACKGROUND.

Besides, to encourage consumer to recycle the plastic bottle rather than discard, plastic bottle waste will affected animal habitat. For example, throw plastic bottle in the river, it can destroy the aquatic life habitat. It is because, when the plastic bottles thrown in the river, it will floating and causing aquatic life difficult to take breathe.

PROBLEM STATEMENT

1. Product is created associated with the recycling of waste material, such as plastic bottles.
2. To reduce the issue of waste disposal in landfills which decreasing in Malaysia.
3. Reduce the disposal of plastic bottles all over the place
4. Reduce environmental pollution.
5. Too much produce of plastic bottle in the industry, provoke too much decomposed wasted are created.

RESEARCH OBJECTIVES.

The objective of study is to create new types of rope from recycle plastic bottle.

METHODOLOGY

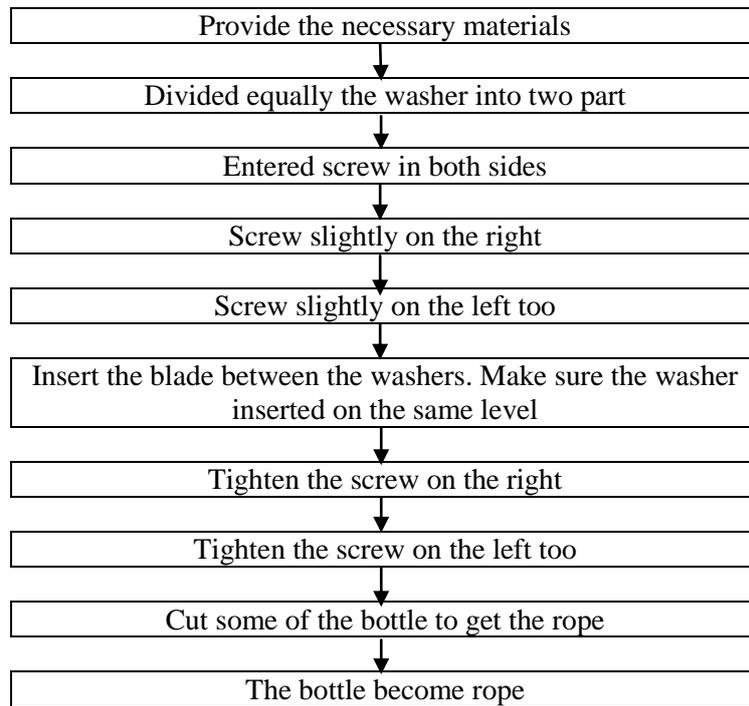
Materials used. Plastic bottles such as mineral water bottles and soda bottles. In order for making RPR, a blade of sharpener been used to cut the bottles. A tool used to cut the bottles are a blade of sharpener, 4 pieces of screw, 10 pieces of washer and wood of board. A screwdriver been used to tighten the screw and a scissor to cut the bottom of bottles shown in Fig. 2.1.

Figure 2.1: Material used for RPR



Theoretical Framework. Fig. 2.2 shows the process to make RPR from raw material by using a tool to cut bottle until becoming RPR.

Figure 2.2: Process to make RPR



Determination of Stress, Strain and Diameter Measurement. Fig. 2.3 shows the process to test on tensile, weighing and diameter of RPR by using a suitable tools and machine.

Figure 2.3: Test on Stress, Strain and Diameter Measurement

| Tensile Test | Weighing Test | Angkup |
|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |
| Length: ℓ ℓ_0 : 62cm ℓ_1 : 67cm | Weight: N 10Newton (N) = 1kg | Width: mm |
| Tensile test known as tension testing. | To measure each time load been added and ensure that the measurements are correct and accurate. | To measure width of each RPR before doing any test on. |
| A fundamental materials science test in which a sample subjected to a controlled tension until failure. | The detectable calibration is the only way to know how far the instrument can withstand the burden. | The width of RPR is variable |

Budgeting Calculation.

Costing. Table 3.1 shows cost of price for each RPR
 Product Name: Recyclable Plastic Rope (RPR)
 Unit: bottle

| Materials | Quantity | Cost (RM) |
|----------------|-----------------------------|-----------|
| Plastic Bottle | 15 bottle | 0.00 |
| Washers | 15 unit | 2.00 |
| Screw | 4 unit | 2.00 |
| Wood | 1 unit | 0.00 |
| Blade | 1 box | 2.00 |
| Sticker | 24 unit | 15.00 |
| Packaging | 15 packet | 15.00 |
| Labor | 1 x Rm3 (per hour) x 8hours | 24.00 |
| Total Cost | | 60.00 |

Total Cost for 15 bottle = 15 RPR is RM60.00

Total Price for each RPR is RM 4.00

Total Profit gain from each RPR take 50% from RM4.00 is RM2.00.

Therefore, Total Price to sell for each RPR is RM6.00

FINDINGS & DISCUSSION

Finding 1: Data information obtained from the respondent that involves in Merlimau area been analyse using Statistical Package for Social Science (SPSS). The result presented in table 4.1.

Table 4.1: Finding Analysis

| No | Question | Mean | Level of acceptance |
|----|-------------------------------------------------------------|------|---------------------|
| 1 | RPR are so light, so you can bring to everywhere | 4.64 | High |
| 2 | The source of RPR easy to find | 4.79 | High |
| 3 | RPR is durable any kind of weather | 4.61 | High |
| 4 | RPR have any type of function | 4.70 | High |
| 5 | The shape of RPR are unique and creative | 4.70 | High |
| 6 | RPR will make your daily life easier | 4.79 | High |
| 7 | The flexibility of RPR give you variety type of tied | 4.70 | High |
| 8 | The RPR can stand heavy load | 4.85 | High |
| 9 | RPR are not easy to string | 4.70 | High |
| 10 | RPR use from recycle waste that can protect the environment | 4.82 | High |

Based on the survey been conducted, it is concluded that RPR has accepted by Merlimau community. The level of acceptance is very high based on the interpretation of the mean range was obtained.

Referring to the Table 4.1, the findings show:

Question 1, 21 out of 33 correspondence (64%) strongly agreed that the characteristics of RPR is portable, simple and easy to use for lifting, bonding and pulling loads.

Question 2, 26 out of 33 correspondence (79%) strongly agreed that the sustainability of the resources to find bottles to make RPR is easy. Orié L. Loucks (1998) mentioned that consumers prefers plastic bottle because it is less expensive material and describe as throwaway item.

Question 3, 20 out of 33 correspondence (61%) strongly agreed that the durability and endurance of RPR towards weather is strong and tough. According to Hopkins, M (2017), handmade rope guaranteed quality, customized size and colours follow customers wants.

Question 4, 23 out of 33 correspondence (70%) strongly agreed that RPR is multipurpose function.

Question 5, 23 out of 33 correspondence (70%) strongly agreed that the characteristics and shape of RPR is beyond the expectation on creativity and uniqueness. Therefore, RPR has designed to be lighter, strong and smart innovation rope to perform complex tasks in a simple manner.

Question 6, 26 out of 33 correspondence (79%) strongly agreed that RPR function and existence are helpful on doing regular or daily routine, forestry, hunting and tough time.

Question 7, 23 out of 33 correspondence (70%) strongly agreed that RPR could do variety types of bonds such as tying books, bottles and motorbike.

Question 8, 28 out of 33 correspondence (85%) strongly agreed that the characteristic or RPR is stretchable but endurance to hold.

Question 9, 23 out of 33 correspondence (70%) strongly agreed that RPR could hold heavy load such as pulling motorbike.

Question 10, 27 out of 33 correspondence (82%) strongly agreed that RPR is a supportive effort to protect the environment from contamination and pollution. According to Legrand Willy (2013), humans are less awareness on recycle, reuse and reduce waste that give negative impact to the environment.

Finding 2: Data information obtained from test on stress, strain and diameter measurement using tensile test, weighing test and angkup. The result presented in table 4.2.

Table 4.2: Finding Analysis

| Load | ℓ_0 (cm) | B ℓ |
|------|---------------|----------|
| 10N | 63 | 1 |
| 20N | 63 | 1 |
| 30N | 63.5 | 1.5 |
| 40N | 64 | 2 |
| 50N | 64.5 | 2.5 |
| 60N | 64.8 | 2.8 |
| 70N | 65 | 3 |
| 80N | 65.2 | 3.2 |
| 90N | 65.5 | 3.5 |
| 110N | 66 | 4 |
| 130N | 66.5 | 4.5 |
| 150N | 67 | 5 |

How to measure the test:

Length: ℓ
 ℓ_0 : 62cm
 ℓ_1 : 67cm

Weight: N
 10Newton (N) = 1kg

Stress: σ

$$\begin{aligned}\sigma &= P \text{ (weight)} / A \text{ (diameter)} \\ &= 150\text{N} / b \text{ (thick)} \times h \text{ (width)} \\ &= 150\text{N} / 0.05\text{mm} \times 0.5\text{mm} \\ &= 150\text{N} / 0.03 \\ &= 5000 \text{ N/mm}^2\end{aligned}$$

Strain: ϵ

$$\begin{aligned}\epsilon &= B\ell / \ell \\ &= 50\text{mm} / 670\text{mm} \\ &= 0.07\text{mm}\end{aligned}$$

Modulus of elasticity: E

$$\begin{aligned}E &= \sigma / \epsilon \\ &= 5000 / 0.07\text{mm} \\ &= 71.429 \text{ kN/mm}^2\end{aligned}$$

CONCLUSION

The result show that there is a new product to protect environment based on recycle item. Thus, through the data analysis performed, most of the respondent strongly accept the function of RPR as an alternative rope.

This study has achieved these objectives:

1. We reuse the plastic bottles that the communities have been recycled which we can see at Section B question 2 „The source of RPR easy to find“ which the mean we get is 4.79 mean and the level of acceptance is high.
2. These show people think that RPR really strength. The strength of RPR are long lasting because of the plastic bottle cannot be decomposed. In Section B question 9 „RPR are not easy to string“, the mean we get from this question is 4.70 that the level of acceptance is high.
3. They were thinking that using this RPR really help generate money. We can generate money from the recycle plastic bottle without using any capital. This objective we can see at Section B question 2 „The source of RPR easy to find“ which mean is 4.79 the level of acceptance is high. The community agreed that the recreate of rope could commercialize in market soon.

In addition, this innovation supporting few courses from Department of Tourism and Hospitality in Politeknik Merlimau Melaka such as Sustainable Tourism and Curriculum: Mesra Alam which give awareness and knowledge to the students about the importance of recycle to the environment.

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