

Article Info:

Published Date: 27 June 2022

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UNDERSTANDING BEHAVIOUR AND PREFERENCE: A STUDY ON DESIGNING LITTER PREVENTION OUTDOOR SIGNAGE

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To cite this article (APA): Sajap, S., Mohammed Ali, N. A., & Zhang, H. (2022). Understanding Behaviour and Preference: A Study on Designing Litter Prevention Outdoor Signage. *KUPAS SENI*, 10(1), 50-58. <https://doi.org/10.37134/kupasseni.vol10.1.6.2022>

To link to this article: <https://doi.org/10.37134/kupasseni.vol10.1.6.2022>

ABSTRACT

This paper discusses Understanding Behaviour and Preference: A Study On Designing Litter Prevention Outdoor Signage. Creating an effective awareness and environmental education has always been a challenge in sustainable development. After the travel ban was lifted, there is a significant increase in improperly disposed garbage in public areas due to an increase in visitors. To achieve goals 12,13, 14, and 15 of the Sustainability Development Goals (SDGs), these issues need to be tackled first and foremost. This study attempts to investigate the issue of littering behavior using a quantitative method. The survey data was collected using 50 respondents as simple random sampling. Three designs that were developed using Lasswell's Communication Model are put to test with local park visitors. The results are then used to draw a relationship between demographic background and littering behavior as well as their design preferences. The results revealed that the design with an educational message is most preferable to visitors and the use of the image is more preferable than the symbol. Future studies, it is expected to develop studies related to design preferences and demographic by applying the Theory of Planned Behaviour and Lasswell's 5W Communication Model in planning for the design.

Keywords: Signage Design, Littering, Sustainability, Public Park, Planned Behavior, Communication Model

INTRODUCTION

The world we live in is currently facing many environmental problems that lead to rising temperatures and a series of natural disasters. In 2015, 17 Sustainable Development Goals (SDGs) were adopted by the United Nations (UN) to ensure sustainable development for all to not only tackle the problems with the environment, but also social issues like poverty and equality. Achieving such goals is not a one-man job, rather everyone is involved in the campaign. It starts small with individuals changing their habits to big corporations substituting for a more sustainable alternative. The issue of littering goes hand in hand with around 5.4 million tonnes of local and commercial waste generated per day in Malaysia (Nor Akmar et al., 2019). Right after the movement control order (MCO) is lifted, a drastic change can be spotted in multiple areas. In Selangor, 100 kilograms of waste were collected in Pantai Remis, Selangor alone (Amirul Aiman, 2021). A volunteer program organized by Nestle Malaysia resulted in over 1,000 kg of garbage collected from beaches all over Malaysia (Muhammad Farid, 2021), and in Penang, 4 tonnes of waste were collected in 3 days in several recreational parks (Malinda, 2021). The superintendent of Penang National Park, Mr. Arham Syazaili also agrees that the park faces improper waste disposal in certain areas (personal communication, February 4, 2022).

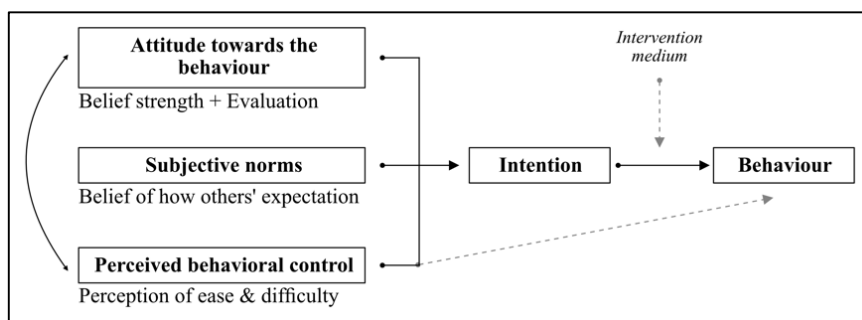


Figure 1. Theory of Planned Behaviour (Ijek Ajzen, 1991)

The use of signage in behavior change has been demonstrated by Brown et al. (2010) Using the Theory of Planned Behaviour (TPB) which was introduced by Ijek Ajzen in 1991. This theory explained how an individual's behavior can be predicted if the conditions are met. Ajzen identified 3 types of cognitive structures that influence the intention of an individual which will lead to specific behavior which is the attitude towards the behavior, subjective norms, and perceived behavioral control. As previously found attitude is the main factor for someone to litter in Malaysia (Hayati et al., 2021; Nor Akmar et al., 2019). Subjective norms are an individual belief of how others expect them to behave and Perceived behavioral control is how the individual perceives how easy or difficult to perform the behavior. One of the conditions to accurately predict an individual's behavior using TPB is to ensure no intervening factors exist in intention and behavior (Ajzen, 1991). Brown et al. (2010) found that signage as a communication intervention medium managed to increase compliance toward positive behavior. Newcomb & Newcomb (2020) also proved that signage managed to influence the proper waste disposal behavior of pedestrians.

Many studies have covered littering issues from a social science perspective. Nevertheless, there is a lack of study from the visual communication perspective although communication is fundamental in changing one's habits. Creating an effective environmental awareness education has always been a challenge The overall purpose of this study is to try to come up with creative outdoor signage to prevent people from littering by understanding the target audience's preferences. This study aims to (i) determine the main factor to litter and the preferred message for the signage, (ii) understand the local visitors' design preferences and their relationship with demographic background, and (iii) determine what can be improved from the designs of littering prevention signages.

METHODOLOGY

Research Design

The study is interested in understanding the issue of littering behavior among local park visitors. The quantitative approach has been used using a survey method is employed to obtain data to conduct the study. To measure behaviors, attitudes, and other characteristics and draw generalizations from a larger population, quantitative research is an appropriate approach to use in this study. According to Creswell (2014), quantitative research is meant for testing objective theories by examining the relationship among variables. In this study, three designs were developed using Lasswell's Communication Model and used to test and get feedback on the local park visitor's attitudes towards the designs created.

Participants

This study focuses on the reaction of local Malaysian to the prototype designs therefore the participants must be chosen from people living in Malaysia. A simple random sampling method is used in selecting participants as every item in the population group has an equal chance of being chosen. However, general criteria are set to ensure that the audience is relevant to the research area. A total of 50 respondents have participated in this questionnaire.

Instrument & Procedure

The post-test procedure was conducted through a simple multiple-choice questionnaire. The quantitative method was chosen as it allows for a wider reach of samples. The quantitative method is often used to simplify and generalize things with closed-ended questions (Muratovski, 2016). The participants can remain anonymous, encouraging them to be more honest when answering. The questionnaire is separated into 3 major parts: i) demographic background ii) littering behavior, and iii) design preferences. The questionnaire is developed using Google Forms as a digital questionnaire as it can reach a larger audience and is safer in storing data. The questionnaire is then blasted using the messaging app (Whatsapp) and social media (Instagram). The questionnaire is up and running for anyone that matches the criteria to participate until the required number of participants is reached.

RESULTS

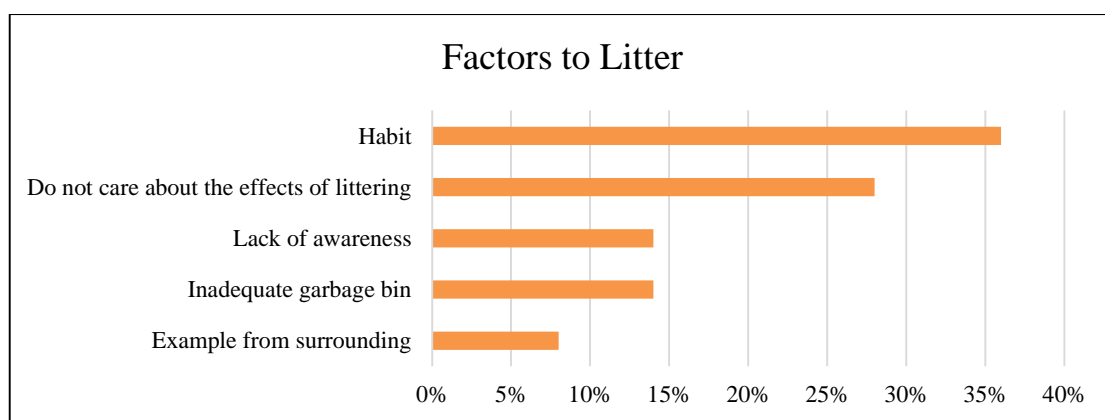


Figure 2. Factors to litter

When asked the possible factor for someone to litter, the majority of 36% agree that habit is the main factor to litter. The least possible reason chosen is "example from others". Applying the theory of planned behavior, a majority believe attitude towards the behavior affects the intention to commit the behavior while subjective norms are the least impactful. While this is in line with surveys by Nor Akmar (2019) and Hayati (2021), it contradicts the survey made by Brown et al. (2010) in America where subjective norms are considered the main factor to commit a behavior. 28% chose ignorance as the cause for someone to litter while 14% picked the lack of infrastructures such as litter bins and lack of awareness as the factors.

Overall Design Preferences for Litter Prevention Signage

Three designs with different messages and visualization were presented to the respondents. The message of each design was outlined by applying Lasswell's 5W Communication Model (Lasswell, 1948) which has been used to analyze advertising mediums and in new media studies (Dolzhenkova, 2021; Constanzo, 2018; Jeffress, 2015; Ketter & Avraham, 2012).

Table 1 Application of Laswell Communication Model

Who	Says What (Main message)	In Which Channel (How to convey the message)	To Whom	With What Effect
Warning	Do Not Litter	Pictogram of the person doing different activities littering		Not litter while doing activities
Educational	How long does litter last?	Simple infographic to show how long each trash takes to decompose	Local Park Visitors	Learn the years taken for litter to decompose
Awareness	Litter ruins the view	Large trash is placed within real-world surroundings with the help of signage material		Understand the effect of litter on the surrounding



Figure 3. Design 1 - "Warning"



Figure 4. Design 2 - "Educational"



Figure 5. Design 3 - "Awareness"

Table 2 Overall design preferences

Design Preferences	%
Pick one design you like the most.	
<i>Design 1 – Warning</i>	24%
<i>Design 2 – Educational</i>	38%
<i>Design 3 - Awareness</i>	38%
Which do you find more interesting?	
<i>Image</i>	82%
<i>Symbol</i>	18%
Which message do you prefer for signage design?	
<i>Warning</i>	20%
<i>Educational</i>	46%
<i>Awareness</i>	34%
Pick one design you like the least?	
<i>Design 1 – Warning</i>	34%
<i>Design 2 – Educational</i>	32%
<i>Design 3 - Awareness</i>	34%

First, we will discuss the most liked and disliked designs by respondents. Design 2 and Design 3 both were picked as the most like design with Design 1 being the least preferred. This matches with the question where respondents were asked to pick the design they like the least where both Design 1 and Design 3 are equal in numbers. This makes Design 2 the most favorable out of the three. 82% of total respondents prefer the use of images over symbols which may be the reason why Design 1 is the least favorable. The trend continues when "Warning" is also the least liked message with only 20% vote. Again, "Educational" has the highest percentage of 46%, followed by "Awareness" at 34%. Although "Warning" is the most common message that can be found for litter prevention signage, it is also the least preferable with only 20% vote. It can be concluded that Design 2 with an "Educational" message and the use of images is the most preferred overall.

Relationship Between Gender and Design Preference

Table 3 Relationship between gender and design preferences

Relationship between gender and design preference	Female	Male
Most Liked:		
<i>Design 1</i>	33%	67%
<i>Design 2</i>	74%	26%
<i>Design 3</i>	95%	5%
Least Liked:		
<i>Design 1</i>	71%	29%
<i>Design 2</i>	75%	25%
<i>Design 3</i>	59%	41%

From the analysis made by comparing gender to design preference, 67% of the people that chose Design 1 consisted of male respondents. On the contrary, only 26% chose Design 2 and 5% chose Design 3. Meanwhile, female respondents prefer Design 2 and Design 3 at 74% and 95% respectively. For the least liked the design, 29% of males pick Design 3 with only a small percentage of 25% for Design 2. 75% of the total respondents that pick Design 2 as the least like is made up of females, making it the least liked the design with highest female percentage. It can be concluded that the majority of male respondents prefer Design 1, while the majority of female respondents prefer Design 3. As for the least liked, most male respondents picked Design 3 while female respondents are divided between Design 1 and Design 2.

Improvements for Final Design

Table 4 Adjustment for the designs

	Design 1	Design 2	Design 3
What do you like about the design?			
<i>Attractive colour(s)</i>	8%	19%	20%
<i>Interesting image/symbol</i>	20%	22%	24%
<i>Message easy to understand</i>	36%	25%	27%
<i>The font is easy to read</i>	20%	17%	12%
<i>Design is neat</i>	16%	17%	17%
What do you dislike about the design?			
<i>Boring color (s)</i>	32%	0%	18%
<i>Image/symbol is not interesting</i>	38%	26%	30%
<i>The message is hard to understand</i>	10%	38%	18%
<i>The font is hard to read</i>	4%	18%	30%
<i>Design is messy</i>	16%	18%	4%
What can be improved from the design?			
<i>Brighter color</i>	10%	14%	4%
<i>Less color</i>	0%	0%	12%
<i>The font is easier to read</i>	22%	14%	26%
<i>The message that is easier to understand</i>	16%	32%	26%

<i>Composition of poster</i>	22%	18%	12%
<i>The use of image/symbol</i>	20%	14%	14%
<i>All of above</i>	10%	8%	6%

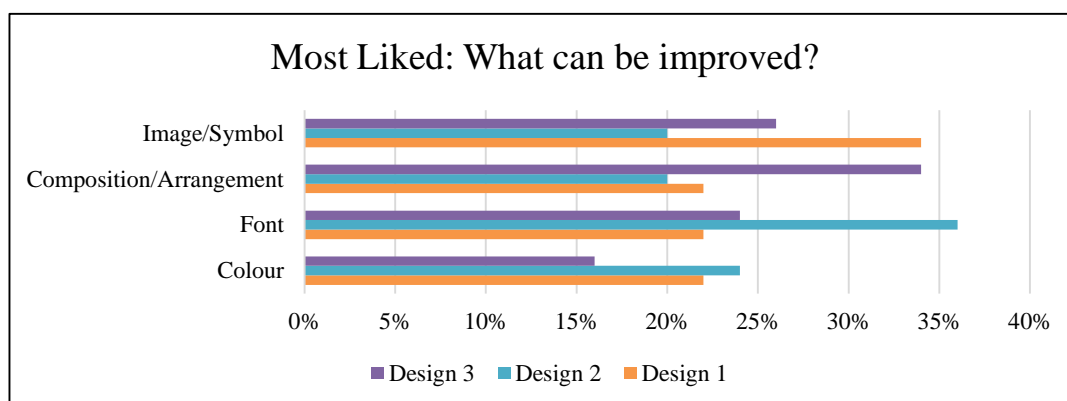


Figure 6. Most liked design: What can be improved?

For the next part, we will discuss further why each design is preferred and what can be improved. 36% of respondents find Design 1 easy to understand. Design 1 also is chosen due to its interesting symbol and font choice. However, 22% and 34% agree that the font and symbol can be improved respectively as well as 38% other that find the symbol uninteresting. Although Design 1 was made using colors that are usually seen on signage, only 8% find the color attractive and 32% find the colors boring. It can be concluded that while Design 1 is easy to understand as it states the message clearly, the choice of color and symbol are not interesting enough as it resembles existing signage. 90% of the respondents agree the design can prevent littering.

Design 2 is mainly chosen for the message as well with a 25% vote despite being picked as one of the least liked with 38% of the respondents thinking the message is unclear. Colour is also one of the weaknesses of the design as only 19% find it interesting while 24% agree it can be improved. 18% also find the font hard to read with 36% of those that like the design wanting the font to improve. The font is also an issue with respondents that pick Design 2 as the least like. 18% of respondents that dislike the poster suggested improvement to the design's composition. Overall, while the design is one of the most preferred and can prevent litter, Design 2 message understandability depends on the person and failed to target different target audiences. However, it has a lot of room for improvement in terms of font, color, and composition.

For Design 3, apart from the message being easy to understand, 24% find the image interesting. Yet, 30% of those that chose Design 3 as least liked to think the image is not interesting and the font is hard to read. Among the designs, Design 3 has more divided opinions from the respondents. While the people that like the design find the composition is the main issue, people that chose the design as the least like think the composition is less of a problem. Colour is not the main appeal and not the major issue with the design but 16% think it can still be improved. In a nutshell, Design 3 has a concept that may appeal to a certain audience while it can also be hard to understand by different audience groups. Nonetheless, the composition may be the major influence on the understandability of the design as it is presented differently than the rest.

DISCUSSION AND IMPLICATIONS

The key in producing a design is to understand beforehand the root cause of the said problem. In this case, knowing the major factor for someone to commit litter, can be a guide in developing the message. Different locations can be the variable for dissimilarities in results produced as illustrated by Brown (2010) in America compared to studies conducted in Malaysia. From survey results, the majority prefer educational messages which are later proven again with Design 2 being the most preferable out of the

three. However, there is also a contrasting difference in design preferences between male respondents in comparison to female respondents. This matter can be tested further in the future with larger sample groups and with a more narrowed approach. Therefore, demographic background and location of signage are two major factors that can determine how the signage can be designed and what message should be communicated.

Although message one is the least liked, since it has a familiarity factor among the respondents, the message is considered the easiest to understand and has little to no issue in terms of color choices. The approach for Design 3 especially is more open-ended and can be translated differently which leads to the message being hard to understand. While Design 2 is aimed to educate, the main message is not expressed clearly – which is what action should do audience take. As suggested by Geller (1982) for antecedent-only interventions, a specific request or prompt should be stated clearly. In this study, two designs include "Bin Your Litter" as the prompt and one with "Do Not Litter". The wording of the prompt is important and in a multilingual country like Malaysia, the prompt should be clearer and more precise. The choice of color, typography, and image plays a major part in making the signage interesting. Boring colors and unreadable text can make the viewers to lost interest in reading. To ensure the flow of the message can be deciphered by everyone, good composition is needed so the eyes will be directed to the prompt to act.

CONCLUSION

As more people are interested in ecotourism, there is a concern about how many adversities it can bring to the environment. An effective and interesting way is needed to educate visitors on environmental awareness. Understanding the root cause for behavior is important in choosing the right message to convey and the overall concept of the design. This study applied Lasswell 5W Communication Theory in creating concepts during the design development process. The use of a survey also provides insights into how different themes and graphic elements have different reactions from the audience. Future research can use this study to further explore the design for litter prevention campaigns, as well as the effectiveness of signage as a visual communication medium in changing an individual behavioral intention towards the environment.

ACKNOWLEDGEMENT

We would like to acknowledge The Ministry of Higher Education Malaysia and Universiti Teknologi MARA (UiTM) for financial support. This study was conducted in the College of Creative Arts, UiTM. We would like to acknowledge the generous participation in the research. Fully appreciate 600-IRMI/FRGS-RACER 5/3 (027/2019).

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