Creative Strategy for Reducing Air Pollution from Motorcycle Exhaust by Urging Urban Motorcyclists to Implement Eco-Riding Techniques

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ABSTRACT
Air pollution has been a prevalent issue in Indonesia for many decades, for years the country has been plagued with the unhealthy air quality affecting its citizens; most prominently in large capital cities such as Jakarta, Tangerang, and Bekasi due to their high population densities. The continuous growth of industry, vehicle population, citizens, and urban development only serve to further contribute to the growing problem of pollution in Indonesia. This paper thus seeks to propose the development of a social campaign with the goal of influencing Jakarta's motorcyclists to apply Eco-Riding techniques to their daily lives. This paper seeks to propose that Eco Riding as a concept is a viable solution to reduce vehicle pollution and rate of traffic accidents in Jakarta. This research was conducted using quantitative methods, where data was obtained through literature studies and observations of the driving behavior, preference, and lifestyle of urban motorcyclists. The results of the study show that air pollution not only affects the environment but also the emotional states of motorcyclists leading to heightened levels of stress, increased risk of accident, and increased vehicle emissions.

Keywords: *Eco riding, media campaign, motorcycle pollution, creative strategy*

1. INTRODUCTION

Indonesia is currently facing an air pollution problem that has been increasing for decades. In the '2019 DKI Jakarta Province Emission Inventory' and 'Emission Inventory and Projection Until 2030' compiled by the Indonesian Center for Environmental Law [1], the amount of air pollution in Indonesia are projected to continue to increase from 60,000 tonnes per year in 2012 to 120,000 tonnes per year by 2030, if left untreated [2]. Several studies have indicated that in urban centers such as Jakarta, the largest contributor to air pollution are motorcycles. High rates of traffic jams and road accidents, most of which involve motorcycles indicate that a large portion of motorcyclists do not employ proper motorcycle riding techniques, which emphasise on safety riding, defensive riding, and efficient fuel consumption. Application of Eco-Riding techniques have been shown to not only reduce vehicle emissions but also create an overall safer road environment due to more riders using safe and defensive riding techniques. Eco Riding as a concept is not completely foreign to Jakarta's motorcyclists. Eco-Riding campaigns have been implemented in the past focused towards educating fleet drivers and motorcycle couriers of private industries to remarkable success but there have yet to be any campaigns directed towards civilian motorcycle riders, of whose numbers make up the majority of the urban vehicle population.

The Jakarta metropolitan area is occupied by more than 30 million people and continues to grow. In the next few decades, Jakarta is expected to become the largest megacity in the world [3], with a population of 35.6 million. Jakarta's rapid growth has coincided with an increase in PM 2.5 levels and air pollution, as population growth adds to traffic congestion, and demand for coal-based energy. Since 2017, PM 2.5 levels in the city have increased by 66%. In 2019, the population was exposed to more than 3 times the number of hours in the "Unhealthy" (US AQI 150+) range compared to the previous two years [4].

The issue of air pollution in Indonesia becomes clearer when you look at the high number of vehicles in urban areas, with the highest concentrations coming from big cities such as Jakarta, Bekasi and Tangerang. It has been stated that 43% of air pollution comes from the transportation sector; making the transportation sector the largest contributor to air pollution in Jakarta, followed by the manufacturing sector at 32% and the domestic sector at 14% [5]. Jakarta's vehicle population is the highest of all of Indonesia, exceeding 22,000,000 vehicles as of 2019 and is projected to increase following the city's increase in population, further contributing to air pollution in

Indonesia. With the largest number of motorbikes with more than 16 million units, followed by passenger cars with more than 4 million units and cargo trucks with more than 1 million units [2].

Apart from the high level of pollution, due to the density of the vehicle population, there is also the problem of traffic accidents. It was reported that in 2019 an average of 27 traffic accidents occurred in the Jakarta area every day. Based on data from the National Police, there were 107,500 traffic accidents in 2019. An increase of 3 percent from 2018, which was 103,672 accidents. 73% of all traffic accidents were caused by motorbikes, followed by passenger cars (11.5%) and cargo trucks (11%) [6].

Jakarta as the capital city which is plagued by congestion, congested roads, and a public transportation system that is still developing which is only used by 35% of Jakarta's population [7]; using private vehicles remains the most efficient and time-saving means of transportation. Taking these factors into account, many Jakartans choose to use private vehicles, especially motorbikes, for accessibility, economy, and avoiding congestion. With all that has been stated, this paper seeks to design a visual communication campaign to educate Jakarta bikers on how to reduce pollution from motorbike vehicles through adopting the Eco-Riding habit.

Eco Riding (also known as Eco Driving) includes motorcyclist behavior, vehicle maintenance and non-driving measures to reduce fuel consumption, vehicle emissions and accident rates; with a driving style that conforms to modern mechanical technology: smart, smooth and safe driving technique. [8]

2. ECO RIDING

The concept of Eco Riding is a development that is considered a pioneer in environmentally friendly driving. In its application, drivers can get many benefits. But unfortunately, not many people apply it in everyday life. The reason is none other than because they still do not understand the term. What exactly is the Eco Driving technique? Then what are the benefits?

An eco-driving study conducted by RACQ; a study that involved training over 1300 Queensland drivers on eco driving techniques; have confirmed that successfully changing driver behavior can significantly reduce fuel and vehicle maintenance costs as well as reduced vehicle emissions. The study employed various methods of training, and on average the participants were able to reduce their fuel consumption by 4.6%. Some participants were even able to reduce their fuel consumption by as much as 15.1%, enforcing the effectiveness and viability of fuel-efficient driving [9].

Other studies specifically focused on reducing the carbon emissions of motorcycles have also shown that simply employing idling-stop requirements on red lights and reducing overall idling time can reduce the fuel consumption of motorcycles by 10-19%, CO_2 emissions by 18%, and NOx emissions by 6.7% [10] [11].

The increasing number of motorized vehicles certainly has an effect on environmental conservation and the use of fossil fuels. Considering that in Indonesia there are more and more motorized vehicles, even reaching 84.6 million units per year, of course the best solution is needed as an effort to reduce this impact. That is the importance of implementing driving techniques that are oriented towards fuel efficiency, otherwise known as Eco Driving [12]

Eco Riding is a way of vehicle operation that aims to optimize fuel consumption efficiently and play a role in reducing the risk of road accidents. Apart from being efficient, the application of the Eco-Riding technique also contributes to environmental conservation programs by reducing the contribution of CO_2 gas, which so far has been the number one source of carbon emissions [13].

Eco Riding combines 3 aspects of riding skills that must be mastered by riders. The other two include Defensive Riding which aims to save lives, time and money, and Safety Riding which prioritizes safe-driving techniques and always thinks ahead of all the possibilities that exist. Interestingly, Eco Riding combines Safety-Riding driving techniques with Defensive-Riding psychology. That's where a riding technique is created that saves time and money, is safe and is environmentally friendly [14].

3. METHODS

The data collection method used in this paper is quantitative by observing the driving behavior, preference, and lifestyle of urban motorcyclists; literature study which is used to obtain information through journals, books, and online media which can support the analysis of promotional media design; and a questionnaire conducted by asking questions to respondents and used to obtain information on target targets widely.

Based on the results of research conducted, several interesting points were found about motorbike users and the impact of pollution on the emotional state of motorcyclists. Based on data collection through face-to-face interviews, surveys, and questionnaires, the target audience of the media campaign is as follows; a demographic aged between 20-25 years, Male, SES (Social Economy Status): B ~ C, geographically located in DKI Jakarta, active on Social Media, and regularly uses motorbikes as their main form of daily transportation. In terms of behavior, they are men aged 20-25 years who have high mobility and daily activities with their own motorbikes, especially for travel and work, and have a tendency to drive motorbikes (aggressively) due to environmental factors or time. They actively use social media, care about vehicle conditions and cost savings, and have shown concern for environmental pollution problems. Based on questionnaire data, from 35 participants, 57.0% of motorcyclists rated 5 and above when asked to rate their frequency of aggressive riding.

Based on questionnaire data, from 35 participants, 77% of Motorcyclists chose "Traffic Jams" as their main cause of aggressive riding. Other frequently mentioned causes of aggressive riding were poor road conditions (as in

inefficient road designs or roads with considerable damage) and higher than average numbers of drivers and riders on the road (mainly during rush hour).

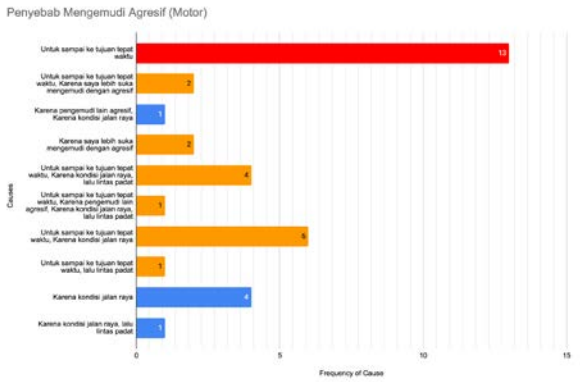

Figure 1. Causes of aggressive riding

When asked regarding the duration of how long participants take to warm up their motorcycles, 62.8% took between 30 seconds to 1 minute; and 40% took between 5 to 10 minutes to warm up their motorcycles. When asked again why participants warm up their motorcycles for those specific durations most answered that they took that long due to habit and had no other reason why they would take longer than 30 seconds to warm up their motorcycles.

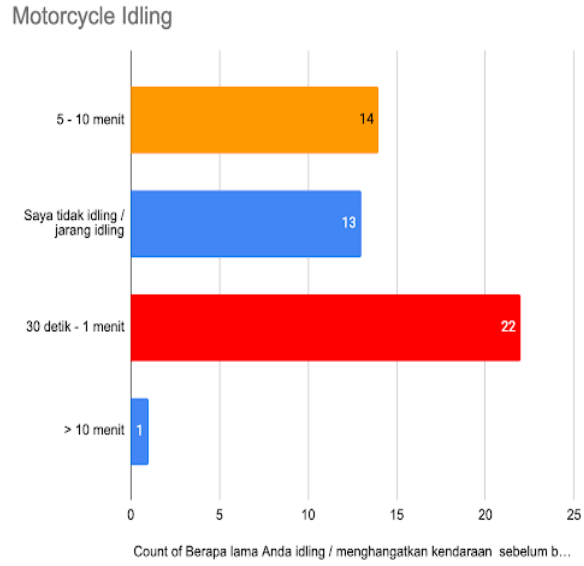

Figure 2. Duration of Motorcycle Idling

The survey showed that a majority of motorcycle owners possessed a lack of understanding of proper and efficient motorcycle habits, and did not apply Eco-Riding practices.

4. RESULT AND DISCUSSION

4.1. Creative Insight

From the data collected It can be concluded that a significant number of motorcyclists are influenced negatively by air pollution, mainly their emotional states. This paper then seeks to convey the message to Jakarta's motorcyclists that Eco Riding is a viable solution that is able to both reduce the amount of pollution created by their motorbikes and also reduce a rider's stress and risk of accident.

4.2. Creative Strategy

From this in order to capture the attention of the target audience, the campaign will reveal how riders appear when stressed and aggressive on the road due to congestion, pollution and uncomfortable weather. The campaign will also combine exaggerated facial expressions with animalistic features to create interesting visuals that can more effectively capture the attention of the target audience. This creative concept will also be called "Wild Reflections".

4.3. Campaign Model and Journey

This campaign will employ the 5A Marketing Model (Aware, Appeal, Ask, Act, Advocate).

In the first stage of Awareness, the target audience will first be exposed to Out of Home (OOH) and ambient media while they are riding, various print media, as well as digital advertisements in social media sites such as Youtube, Facebook, and Instagram. In this stage the target audience will be exposed to Wild Reflections visuals and appeal to the target's negative experiences while riding due to pollution and make them realize the negative influence of vehicle pollution on their daily moods, they will also be briefly introduced to the concept of Eco Riding.

In the second stage of Appeal, after being introduced to the concept of Eco Riding, the target audience will then be directed towards the campaign's official Instagram account. In said account the campaign will post various facts about the negative impact of vehicle pollution on the environment and emotional states of motorcyclists. The Instagram account will also briefly explain how Eco Riding as a concept can be used to solve the various problems stemming from vehicle pollution.

In the third stage of Ask, the target audience will then be directed towards the campaign's microsite. The microsite will contain more detailed information on Eco Riding. As well as various interactive activities for visitors to learn about Eco Riding.

In the fourth stage of Act, the microsite will also feature a Weekly Eco Riding segment which serves as a weekly guide for motorcyclists to adopt and focus on a single Eco-

Riding habit every week, enabling the target audience to be able to slowly change their habits and effectively apply Eco-Riding techniques to their daily lives.
In the fifth and final stage of Advocation, those of the target audience who have actively participated in the campaign and have benefited from the campaign will be given a channel where they can share their experiences with the campaign to others as well as invite other people to participate in the campaign, increasing the spread and reach of the campaign.

Figure 3. Eco Riding Key Visual - Lion

Figure 4. Eco Riding Key Visual – Fish

Figure 5. Eco Riding Key Visual - Horse

5. CONCLUSION

The conclusion derived from this paper is that Eco Riding as a concept can become a viable solution to reduce vehicle pollution and rate of traffic accidents.
Properly changing Jakarta's motorcyclists to inefficient habits and changing their behavior to adopt Eco-Riding habits, by educating motorcyclists that with Eco Riding they can minimize pollution and bad mood, thus preventing them from driving stress and accidents. Jakarta's motorcyclists will learn that Eco Riding is not only about changing the way a motorcycle is ridden, but also about the mentality and how to control emotions while riding.

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