

## Awareness of e-waste among youth in Malaysia

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**ABSTRACT:** Malaysia has expected to generate 24.5 million units of e-waste by year 2025. Inappropriate and unethical handling of e-waste can invite significant human and environmental health risks. The substantial e-waste in Malaysia is generated by mobile phone users. According to the data reported by the Department of Environment Malaysia, the youngsters below the age of 20 are the largest users of smartphones compared to users in other age groups. Thus, this study aims to investigate the awareness of e-waste among youth in Malaysia. The data was collected using an online survey via Google Form. The form was disseminated using WhatsApp messages by researchers to the students in public and private universities. The results show that more than half of respondents are aware of the hazardous pose of e-waste to the environment and human health. However, more than half of respondents prefer to keep their damaged devices at home. Therefore, by understanding the awareness of youth on e-waste would guide the policy makers to improve the e-waste management and the possibility of minimizing it. In addition, higher educational providers could design customized awareness programmes for addressing this concern more effectively, especially on e-waste management and risk of e-waste. The use of social media intervention is suggested.

**Keywords:** *e-waste; youth; social media*

### 1. INTRODUCTION

E-waste as defined by the Department of Environment Malaysia is electrical and electronic appliances that are broken, non-working or old/obsolete such as television, personal or desktop computer, air conditioner, washing machine and refrigerator. This paper is focusing on mobile phones or small gadgets that are usually used by youngsters as the biggest e-waste generated by mobile phones [1]. Based on the survey in 2018, there were around 17.2 million smartphone users in Malaysia with over 85 percent of mobile phone users under the age of 20 having a smartphone [2]. While data reported by the Malaysian Communications and Multimedia Commission (MCMC), about 94 percent of users below 20 use smartphones, the biggest compared to another group age [3].

E-waste imposes a potential hazard to the environment and human health. It can release various Volatile Organic

Compounds (VOCs), the compounds that have a high vapor pressure and low water solubility which impact the surrounding ambient environment [4]. Users often have no or limited knowledge where to recycle or dispose of discarded electronic devices such as mobile phones. If electronic devices decompose in landfills, hazardous compounds can leach into groundwater, therefore posing health risks to not only people but also wildlife [5].

The policy makers need to have the valuable insights to take appropriate steps to educate, reduce and manage e-waste among households [6]. The results in the 2019 study show that the respondents' e-waste disposal knowledge and e-waste disposal attitudes were at a high level, while their e-waste disposal practices were at a medium level [7]. Another study reveals that educational background is the main factor that affects the knowledge, attitudes and practices on e-waste recycling. Mass media, such as television, radio, and the internet, are the most likely sources of information on e-waste recycling for the respondents [8]. Therefore, this study will add more valuable data to the existing literature, particularly among youth.

### 2. METHODOLOGY

The online survey was disseminated to the respondents using Google Form. The researchers used their students' contact to send the messages to the students. The messages were forwarded from group to group of students. The respondents were informed about the purpose of the survey and the researchers are from public universities. The identity of respondents such as name or email address was not collected to protect respondents' privacy. Total 14 items were used to measure the knowledge and awareness of e-waste with 3 items for demographic data.

### 3. RESULTS AND DISCUSSION

Analysis of the 401 data reveals that 98.5 percent of respondents in the age group 15 to 19 years old with 54.1 percent respondents were male. Almost all respondents were students (97.8 percent). Table 1 shows the percentage of respondents who agree with the items.

Table 1 Knowledge and Awareness of e-waste

Items	Percentage
Agree with the definition of e-waste	76.3

Mobile phone users	98.8
Keep the damaged devices at home	66.6
Disposed the damaged devices with household waste	18.7
Sell the damaged device to recycle center	26.9
Aware that some hazardous fractions in e-waste need special treatment	77.1
Aware that mobile phones contain materials that are hazardous for the environment	67.6
Aware that e-waste poses a serious threat to the environment	73.6
Aware of any health risk/s associated with e-waste	69.1
Aware that some manufacturers offer a free worldwide recycling program for their consumers	39.4
Willing to sort household e-waste to protect the environment	75.3
Willing to purchase environment friendly devices to reduce the impact of e-waste on environment	77.6

The increasing number of mobile phone users among youth aged 15 to 19 shows the possibility of having more e-waste in the near future. The number of mobile phone users increase to 98.8 percent for users below 20 compared to the data from MCMC in 2018. Estimated 66.6 percent respondents prefer to keep damaged devices at home and 18.7 percent of respondents choose to dispose with household waste. Even though about 73.6 percent respondents aware that e-waste poses a serious threat to the environment and 69.1 percent respondents know the health risk associated with e-waste. Only 39.4 percent respondent aware that some manufacturers offer a free worldwide recycling program for their consumers. Interestingly about 77.6 percent respondents willing to purchase environment friendly devices to reduce the impact of e-waste on environment. This data evidence the need of more campaigns and programmes so the users know the risk of e-waste and knowledge for managing the discarded devices. There are numerous studies indicating that campaigns and programmes would influence public positive attitudes [9]. As the number of social media users increasing every year, the use of social networking sites for instance Facebook, Instagram, Twitter and TikTok for campaign and knowledge dissemination is more than encouraging [10]. Besides, social media have external analytic tools to better provide insights of the campaign effectiveness.

#### 4. CONCLUSIONS

Without doubt mobile phone is important particularly during this hard pandemic time. However, our reliance on mobile phone and other electronic devices comes with steep environmental costs, from mining minerals to disposing of used devices. Thus, conscious about the level of awareness is important to learn the attitude and behavior of people on this issue. The finding highlights the need for public awareness campaigns especially among youth as they are the largest group of mobile phone user. The campaign on the risk of e-waste to human and environment and proper e-waste

management practices is vital. This would not only helps limit the need for mining raw materials from the earth but also critical for the world to maintain its sustainable and resilient environment. In today's fast changing world, social media has greatly transformed the business landscape, likewise the impact of social media for e-waste campaign.

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