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Preferred Attributes of Waste Separation Behaviour: An Empirical Study

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Abstract

This study attempts to identify the preferred attributes for waste separation behaviour among communities in Malaysian universities. Recycling is a plausible path to reduce the amount of waste generated in the country in a sustainable way. Regrettably, less than 10% of the waste in Malaysia is recycled. Separating the waste before recycling is important to avoid contamination of waste, which could diminish the value of recycling while increasing the recycling rate. Results of a preliminary survey conducted on a university campus indicate that the waste separation behaviour in the community on campus is not encouraging. A total of 564 convenience samples were invited from the community of the Universiti Teknologi Malaysia to provide their preferred attribute for waste separation behaviour on campus. A choice-based conjoint analysis identified a set of four attributes to foster waste separation behaviour, comprised of the following attributes: accessibility to the recycle bin, incentive, reminder, and information. Each attribute is associated with a list of sub-attributes. The accessibility to recycle bin attribute was identified by the community as the highest priority attribute for waste separation, with a share of 48%. The set of attributes proposed in this study will help the university management when making decisions and allocating scarce resources to foster waste separation behaviour among the community and fulfilling its social responsibility.

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1. Introduction

Global waste has increased about 28% from 5.6 Mt in 1997 to 7.65 Mt in 2007 and is estimated to further increase by 30% in 2020 [1, 2]. Based on the statistics from [3], the solid waste generated from East Asia and the Pacific Region such as Malaysia, Singapore, Indonesia is approximately 270 million tonnes per year. The amount of waste produced is expected to increase dramatically, parallel with the continuously increasing population and development. In Malaysia, municipal solid waste generation has gained prominence and is said to have increased more than 91% over the past 10 years [4]. The treatment of waste in Malaysia mostly relies on landfills, despite their negative impacts on the environment. Surprisingly, approximately 80% of the solid waste generated in the country are recyclables but disposed in the landfills [5].

Solid waste needs be managed properly and failing to do so will attract other issues such as expensive operation costs, environmental pollution, land scarcity, etc. Recycling is one of the most effective methods used to reduce wastes [6]. Malaysia's target is to increase the nation's recycling rate to 22% by the year 2020 [7]. Regrettably, recycling in Malaysia is still in its infancy [8]. The former National Solid Waste Management Director once stated that, "Malaysians need to work harder to practice 3R if compared to neighbouring countries, such as Singapore which has average recycle of 58% of their total waste" [9]. According to Solid Waste Corporation's chief executive officer Datuk Ab Rahim Md Noor, out of the 33,000 tonnes of solid waste collected daily in Malaysia, only 10.5% was recycled while the rest was disposed of at the disposal sites [10]. The average recycling rate in Malaysia is only 10.5% while for the commercial and institutions sector it is even lower at 7.4%; recyclable materials generated per employee were at 0.12 kg/employee/day out of 1.94 kg/employee/day [11].

The Malaysian government is committed to reducing the country's waste generation for a sustainable society. As in the Eighth Malaysia Plan (2001–2005), the emphasis has been placed on waste minimization while in Ninth Malaysia Plan (2006–2010), the government further emphasised Reduce, Reuse, and Recycle (3R). In the recent Tenth Malaysia Plan (2011–2015), the government is urging the nation towards waste separation practise. Recently, the Malaysian government has launched a programme called, "Separation of Solid Waste at Source," the mandatory separation of waste at the source in stages effective 1 September 2015. The programme aims to reduce the amount of solid waste sent to dumpsites by up to 40% by the year 2020, as well as to increase the rate of recycling in excess of 22% by the year 2020, as the government has committed. This is possible if the nation aggressively progresses towards waste separation behaviour. Separating the waste that has recycling value such as plastic, paper, and glass is the initial step to increase the recycling rate. Proper waste separation will not only increase the recycling rate, but also reduce the volume of waste and reduce detrimental impacts to the environment [12,13]. As in a study conducted by [14] in an institutional context, 16 months of a recycling programme conducted on a campus showed that the waste separation performance can increase the recycling rate to 84%.

Every programme's success relies on the cooperation of the people and its community. For that, the active practise of waste separation behaviour among the community is among the key ingredients in realising the target set in Malaysia. Due to the large size and population of the campus community, universities produce large volumes of waste [15]. A university is an organisation that involves a large community and contributes to a significant amount of the country's waste generation. As a waste producer, a university is responsible for managing its own waste. Previous research has highlighted the poor progress made in waste separation practise in the nation. Referring to a preliminary survey conducted at the Universiti Teknologi Malaysia in the year 2014, results showed that the campus community did not separate the waste according to the colour label of the recycle bins; instead, they contaminated and mixed different types of recyclables waste in a recycle bin. Solid waste that has recycle value should be separated to avoid contamination of waste. Contamination of the recyclables will decrease the value of the recycling. [16] has conducted a study in an institutional setting in Malaysia, and found that only 18% of the respondents practise waste separation on a weekly basis.

Poor waste separation behaviour among the community may be due to various factors that prohibit the waste separation practise, which may include a limited market for recyclables, lack of information about the right way to separate waste, poor access to recycling facilities, etc. To effectively foster waste separation behaviour among the community, identification of the right combination of attributes that facilitate the behaviour change must be identified. Attributes of waste separation behaviour can be described as components that likely encourage and

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