

EXAMINING THE RELATIONSHIP BETWEEN ENVIRONMENTAL AWARENESS AND GOVERNMENT TOWARDS GREEN TECHNOLOGY IMPLEMENTATION AMONG MALAYSIAN UNIVERSITY STAFFS

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Abstract

Current situation where there is increasing on public awareness on act environmental legislation, manufacturers become pressure to produce environmentally products. It is observed that sourcing, manufacturing, logistics, and marketing activities of these organizations have an impact on the environment. Green technology (GT) is defined as the development and application of products, equipment and systems used to conserve the natural environment and resources, which minimizes and reduces the negative impact of human activities (Malaysia Productivity Corporation, 2010). However, the concept of green technology provides the framework for continued improvement. The Malaysian Government's commitment to green technology industries is clear. This is evident in the commissioning of the Green Technology Policy 2009, and the establishment of the Green Technology Financing Scheme (GTFS) in the 2010 had extended until 31 December 2017. This study explore issues regarding awareness that influence green practices, especially in developing countries and the respondents total 405 for this study are among public university staffs . This study involves looking at relationship between environmental awareness and government support toward green technology implementation, among university staff. Both variables show strong relationship towards green technology implementation.

Keywords: Green Technology Implementation, Environmentally Product, Outsourcing

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Introduction

Sustainability is increasingly becoming a hot topic and everyone is talk about it. Each organization worldwide like manufacturer, government and corporate are seemly take their responsible to sustainability. The term and the concept of sustainability and sustainable development is being popularized today and started to emerge everywhere staring from our household until the large scale manufacturing, retailing and service industries' operations. To enable Malaysia becoming a great nation in the 21st century, sustainable development practices are essential. Promoting green technology has been found as one way to sustainable development. The Malaysian Government realizes that in 21st century, renewable and sustainable energy as well as green technology will be the core of economic growth for all countries (Malaysia Productivity Corporation, 2010). In order to reduce or solve environmental threats, the world are force to going green especially in Asian Region (Irawan & Darmayanti, 2012).

Malaysia is one of the earliest countries in the world that have taken a serious consideration regarding the environment by enacting the Environment Quality Act way back in 1974 (Mei, Ling, & Piew, 2012). Malaysian government has played a strong role in ensuring environmental sustainability by way of introducing necessary policies and implementing green technology (Abu Bakar, Mohd Sam, Tahir, Rajiani, & Muslan, 2011). Beside the introduction of new legislation to protect the environment, the Malaysian government has also recently formed a new Ministry of Energy, Green Technology and Water to cater to the rising need and importance of green technology towards sustainable advancement (Mei *et al.*, 2012). Green technology refers to the development of environmentally friendly products and processes. Green technology (GT) is defined as the development and application of products, equipment and systems used to conserve the natural environment and resources, which minimizes and reduces the negative impact of human activities (Malaysia Productivity Corporation, 2010). As mention by Jha (2013), green technology are the products and technologies for peoples' conveniences without environmental damage.

Activities of university have a substantial impact on the environment. The use of natural resources like electricity, water, paper and the production of waste were impacts the environment. Recently, universities in Malaysia become interested to implement green technology in their campus. One of the main issues regarding green technology is environmental awareness. People who in charge of sustainability in university often complain that significant portion of the university community are unaware and not interest in sustainability (James & Card, 2012). Therefore, many campaigns have been held by government agencies and private companies in order to foster environmental awareness within society and increase public participation in a variety of environmental preservation programs (Han, Hsu & Lee 2009). Sulaiman & Abdul Rahman (2013) pointed out that studies on environmental awareness in university are still less explored area particularly in Malaysia. Prior studies have largely focused on profit organizations and companies in the manufacturing sector.

Besides environmental awareness, Puvanasvaran, Yop Zain, Al-hayali, & Mukapit, (2012), agreed that the strong support from the government enhances the development of green technology in Malaysia. Moreover, the research by Wabwoba, Wanyembi & Omuterema

(2012), was concludes that legislation plays an important role in technology innovations being implemented. The cost of buying green technology products is generally high depends on technology use. According to Mustapa, Peng, and Hashim, (2010), green technologies bring a certain amount of uncertainty which is high financing costs of research, development and deployment. This situation will cause a barrier for its development (Mustapa *et al.*, 2010).

In the light of the discussion above and because of green technology in Malaysia are facing problems on the implementation, this paper attempt to examine the factors attracting green technology implementation. The study focused on green technology implementation among Malaysian university staffs. Specifically, there are two primary objectives of this study. First objective is to identify the relationship between environmental awareness towards green technology implementation. The second to identify the relationship between government supports towards green technology implementation.

Literature Review of Green Technology Implementation

Environmental Awareness

Despite government support, environmental awareness is other predictors of intention to implement green technology. Surveys by scholar Devine-wright (2007), have found that there are low level of awareness regarding energy consumption and climate change. An understanding the concept of green technology is closely related to the how environmental consciousness in its implementation. As coded by Devine-wright (2007), although staff may be aware of different energy sources, more in depth understanding of these sources vary markedly. Greater awareness on green technology in Malaysia can be instilling when higher education institutes offer mandatory courses (Bernama, 2012).

According to Velazquez *et al.* (2005), there are lacks of involvement and participation to sustainability among campus surrounding like professors, students and also staff. It seems that they have not yet completely understood their responsibility to present and future generations and their participation is often insignificant. There are several examples of unsustainable behaviors often done by university community like not turning off the lights when living the classroom, throwing materials in wrong recycling bins and also leaving computers turned on all day (Velazquez, Munguia, & Sanchez, 2005). As stated by Velazquez *et al.* (2005), lack of awareness seem to be the greatest barriers to sustainability initiatives. In addition, Derahim *et al.* (2011) mentioned that, awareness and knowledge of sustainability among campus community are elements to successful implement sustainability concept in university. Increasing the awareness of the seriousness of environmental problems has led to an increasing number of individuals to perform environmentally friendly behavior (Rezai, Kit, Mohamed, & Nasir, 2013). Hence, increasing awareness among staff will also increase the staff commitment towards green technology implementation.

Government Support

Government support is also one of important factor influencing green technology implementation. Since 2009, there have been numerous initiatives as well as rules and regulations regarding green technology. Prof Dr. Karl Wager said that, there is one regulation that is probably still missing which is the regulation on energy efficiency and will going implemented from 2014 onwards (Bernama, 2012). On the other hand, government can offer resource subsidies to levying text for green technology investment (Zhu, Sarkis, Cordeiro & Lai, 2008). In Malaysia, government offer various environmental incentives for the manufacturing sector such as capital rebate of up to 50 percent for purchase of recycling machineries and exemption on import duties and sales tax for such machines (ElTayeb, Zailani, & Jayaraman, 2010). According to Velazquez *et al.* (2005), “lack of support is not only absence of funds but also the absence of leadership among university management. There is a need for more government support for green technology implementation. As mention by Velazquez *et al.* (2005), more rigorous regulations are needed for sustainable development. Besides that, it is also necessary to put more emphasis in the enforcement of those regulations in order to effectively promote sustainability.

According to Velazquez *et al.* (2005), the existence of policies for backing sustainability initiatives was rarely found in universities and when they exist, policy enforcement was lacking and not truly effective in guiding daily campus activities. They found that the amounts of funding and grant awards to implement sustainable projects on university are lower. The budgetary limits of projects ultimately force the participants to search for cheap products and donated items, and affect other aspects to successful participation and perception of the green campaign (Zimmerman & Halfacre-hitchcock, 2006). They also stress that, in order to involve students in green technology implementation, a project budget must include sufficient funds for purchasing the new technology and devices for the building. Amrina and Mohd Yusof (2012) had underlined that lack of top management commitment is also considered as the major obstacle in implementing sustainable manufacturing. They also suggest that in order to successfully implementing sustainable manufacturing, top management must give their full commitment like support infrastructure and providing sufficient resources needed.

Financial incentives also one of the governments supports. In SMEs, incentives related to finances are considered to be of great importance driver in environmental improvement (Moorthy, Yacob, Chelliah, & Arokiasamy, 2012). This includes availability of public funding programs for green initiatives and tax, fee and subsidy system in the country. For example, in Malaysia, Green Technology Financing Scheme (GTFS) was announced in National Budget 2010 and was the first soft loan given to companies towards supporting green technology (Moorthy *et al.*, 2012). Hence, financial incentives are vital to drive environmental improvement. Previous study by Gallagher and Muehlegger (2011) identified that variety incentives offered by the federal, state and local governments are the drive motivating consumers to adopt new hybrid vehicles. Another study by Zhu, Sarkis, and Lai (2007) found that government support may also lessen barriers for organizations to embrace environment practices. Government policy (GP) can help higher education institution to obtain green technology by training and providing technologies (Zhu *et al.*, 2007). A study by Min & Galle (2001) found that there is a significant positive relationship between GP and green manufacturing.

Methodology

The discussion of methodology addresses four sections including item measure development, questionnaires development, survey administration and data analysis.

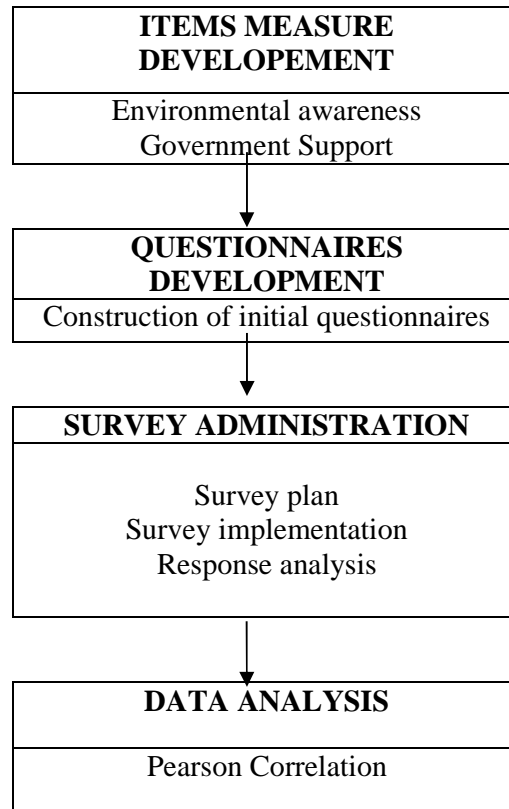


Figure 1: An overview of research process

The objectives of this study are: (1) to identify the relationship between environmental awareness towards green technology implementation, and (2) to identify the relationship between government supports towards green technology implementation. The study was conducted in two phases, phases 1 was a pilot to examine the reliability of the instrument and phases 2 was main study using revised instrument to examine the relationship among the variables. A survey method using questionnaires was chosen for data collection. The questionnaires contained the two major independent which were environmental awareness and government support and also green technology implementation for dependent variable. Besides questions for variables, these questionnaires also involved questions demographic

information, such as gender, age, position, department and work experience. The respondents were asked to rate each item based on 5-point Likert scale from 1= strongly disagree to 5=strongly agree.

The research was focused to public universities in northern region in Malaysia. In this research, the unit of analysis was the individual staff. Each respondent was chosen to represent a university. The population for these university was around 12,000 staffs. It is impossible to study on 12,000 staffs, therefore sampling area procedure will be done. The size of sample size was chosen based on Krejcie and Morgan (1970). Based on that table, a number of 370 staffs are needed to be selected from 12470 staffs. In order to accurately get these 370 samples or reduce non-response error, 600 set of questionnaires were given to 600 staffs in Northern Region of Malaysian University. Simple random sampling was used in order to select the 600 samples.

In this study, respondents were got the link of questionnaires through email. This method of data collection facilitated easy and inexpensive compared to mail survey. They can answer the questionnaires by click the link given. These questionnaires were via online survey which was created using google drive software. The data collected through questionnaires were coded and analysed using Statistical Package for the Social Science (SPSS) version 20.

Result and Discussion

Descriptive Analysis

In this research, descriptive statistics have been measured on the independent variables which consist of environmental awareness and government support. The highest result in mean would determine that respondents are more likely to agree into particular variable towards green technology implementation. According to Table 1 below, the mean of environmental awareness was 4.3404 and government support was 3.7880. Since the mean value for environmental awareness is higher than the mean value of government support, therefore it means that majority of respondents agreed that environmental awareness plays an important role towards implementation of green technology. Besides mean value, the value of standard deviation also been considered. Standard deviation measures how spread the data is from the mean. As refer to Table 1, the standard deviation value of environmental awareness was 0.49420 while government support is 0.67400. By referring to the both value of standard deviation, environmental awareness has lower value compared to government support. Since the environmental awareness data from the respondents was near to the mean value, it means that respondents were agreed that environmental awareness was more effect implementation of green technology compared to government support.

Table 1
Descriptive Statistics of Variables

Variables	Mean	Standard Deviation
Environmental Awareness	4.3404	.49420
Government Support	3.7880	.67400

Green Technology Implementation	3.7733	.59285
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Pearson Correlation

As the level of measurement of the variables concerned was interval and all the assumptions were satisfied, the parametric correlation technique was used to test the hypotheses. Therefore, to answer the research objectives, the Pearson Correlation methods were used to measure the relationship of a set of independent variables and the dependent variable. The significant level was 0.05, as a percent 95% confident level was desired.

Hypothesis tested extend to which Environmental Awareness and Government Support was positively related to the Green Technology Implementation.

Table 2
Correlation between Environmental Awareness and Green Technology Implementation

Variable		EA	GTI
Environmental Awareness (EA)	Pearson Correlation	1	.358**
	Sig. (2-tailed)		.000
Green Technology Implementation (GTI)	Pearson Correlation	.358**	1
	Sig. (2-tailed)	.000	

** Correlation is significant at the 0.01 level (2-tailed)

Table 2 shows the correlation analysis between environmental awareness and green technology implementation. According to that table, it proves that there was a significant relationship between environmental awareness and green technology implementation with significant value 0.000. Since the significant value was less than 0.05, therefore environmental awareness has positive relationship with green technology implementation.

Table 3
Correlation between Government Support and Green Technology Implementation

Variable		GS	GTI
Government Support (GS)	Pearson Correlation	1	.485**
	Sig. (2-tailed)		.000
Green Technology Implementation (GTI)	Pearson Correlation	.485**	1
	Sig. (2-tailed)	.000	

** Correlation is significant at the 0.01 level (2-tailed)

Table 3 shows the correlation analysis between government support and green technology implementation. The table proves that there was a significant relationship between government support and green technology implementation with significant value 0.000.

Since the significant value was less than 0.05, in other word, government support has positive relationship with green technology implementation.

Conclusion

This paper aims to studies the relationship of environmental awareness and government support towards green technology implementation. These two factors are selected in order to address the main problem of green technology implementation as described earlier. From this study, it was revealed that two independent variables which was environmental awareness and government support had significant relationship with green technology implementation. In other words, the results suggest that environmental awareness and government support play crucial roles in ensuring successful green technology implementation. This was gives sufficient impact on the role of two variables towards green technology implementation in Malaysia as a whole of renewable energy technologies: a critical review.

Besides that, this study also provides valuable insights to policy makers so that they may take appropriate step to successful implementing green technology. Other than that, this study will contribute to literature in the area of environmental awareness in a nonprofit service organization.

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