Global Business and Management Research: An International Journal
Vol. 13, No. 4s (2021)

Awareness and Knowledge Level of School Teachers on the Use of Green Technology Products: A Pilot Study

Normaisarah Abdul Manaf *
Universiti Tenaga Nasional
Email: Sarah@uniten.edu.my

Mohd Zulkeflee Abd Razak
Universiti Tenaga Nasional
Email: Zulkeflee@uniten.edu.my

Siti Fara Fadila Abd Razak
Universiti Tenaga Nasional
SitiFara@uniten.edu.my

Noor Awanis Muslim
Universiti Tenaga Nasional
Email: Awanis@uniten.edu.my

Dasilah Nawang
Universiti Tenaga Nasional
Email: Dasilah@uniten.edu.my

Feninferina Azman
Universiti Tenaga Nasional
Email: Ferina@uniten.edu.my

Inas Sofiya Mohd Zamri
Universiti Tenaga Nasional
Email: inassofiya@gmail.com

Nurain Sakinah Mohd Arshad
Universiti Tenaga Nasional
Email: aenkeynah@gmail.com

** Corresponding Author*

Abstract
Purpose: The objective of this pilot test is to study school's teacher awareness and knowledge level on the use of green technology products in their daily life
Design/methodology/approach: This pilot study responded by 10 school's teachers in several states in Malaysia collected through online questionnaire distributed. The data collected analysed by descriptive method only.
Findings: Only 10% of the teachers does not aware of the existing or use of green technology products in their daily life routine. Overall result shows that, respondents have high knowledge level toward green technology and its products with mean value of 4.08.

Research limitations/implications: This study suggest that further data collection and study should be conducted in order to explained and understand more on awareness and knowledge level of school's teacher in Malaysia.
Originality/value: This study will help with the implementation and knowledge spread to the consumers.
Paper type: Research paper

Keywords: Green technology, Awareness, Knowledge

Introduction

In this era of technology, some of our activities and products that we use turned to give a negative impact to environment and future generations. Activist and government all over the world working on to create awareness to the public on the use of green technology products. In general, green product classified as an ecological or environmentally friendly products available in the market.
Moe (2019) listed among available green technology products in the market are:

a. Dryer ball
b. Eco-friendly paper shredder
c. Biodegradable straws/food utensils
d. Solar lights
e. Eco-friendly papers
f. Hybrid cars
g. And other product derived from scarps of other products

Green technology is the development and implementation of goods, equipment, and frameworks that protect the environment and natural resources while mitigating the negative effects of human activities (Ministry of Energy, Green Technology and Water, 2015).
According to Shamdasami et al. (1993), green product is a product that will not harm the earth or destroy natural resources. It is said that green products are any product that can be reused or conserved.

Figure 1: Symbols Used to Represent Green Technology

Green technology said to be among the best approach in order to help coping with the environmental issues and for economic growth. The Malaysian government has addressed taking action by prioritising environmental issues, particularly those related to global warming and climate change, in its Malaysian Plan.
In July 2009, the National Green Technology Policy (NGTP) was announced. It was established in line with the general trend of sustainable development techniques. The Green Technology Master Plan (GTMP) 2017-2030 is the result of the Eleventh Malaysia Plan (2016-

2020), which identified green growth as one of six goals for improving the country's growth trajectory.

The GTMP establishes a framework for mainstreaming green technology into Malaysia's planned initiatives while taking into account the four pillars outlined in the National Green Technology Policy (NGTP), namely energy, environment, economy, and social. (Ministry of Energy, Green Technology, and Water). It targets to supply a heading and inspiration for Malaysians to persistently appreciate great quality living and solid environment through the decrease of the carbon impression without compromising financial development (Jaafar, Yahya & Hussain, 2014).

Government of Malaysia endorsed official green recognition name MyHIJAU mark. It is an initiative embarked by Malaysian Green Technology Corporation (GreenTech Malaysia). The goal of this mark is to encourage Malaysians to source and buy green products and services. Its goal is to inspire Malaysians to embrace environmentally friendly activities while also stimulating the growth of the country's green economy.

Figure 2: A Symbol of Green Change

Government and non-government organisation (NGO) also played their role in order to educate and increase communities' awareness towards the use and impact of green technology in our daily life. It is very vital to educate them on the impact of not using green technology because of the long-term effect for our future generations.

The most significant advantage of utilising green technology is that it can enhance our quality of life. Monu (2015) said green technology does not emit harmful to the air that we breathe. Improving a better life for our future generations. It is our concern to keep on doing research to see the level of awareness among community in Malaysia.

Krause (1993) in his study found that consumers were becoming more concerned about their everyday habits and the impact on the environment. Thus, this study focuses on school's teachers because they would be the second level of influencer to our future generation after family and friends. By studying the level of awareness and knowledge of school's teachers, we could expect that they could also share knowledge to our children.

Literature Review

The majority of the world's countries are now moving towards the green technology. Report prepared by Cleantech Group listed a few country that implement green technology. In Labex Korea articles, no 1 country implement green technology is Denmark. Even small in size, but the country has the highest potential in making major changes for sustainable future. In the same report, Israel nominated as number two in ranking for green technology development. The country looking at the sun for a solution in green technology.

All of this due to increasing awareness towards the need to take a good care of our earth for future generations. One of the most widely use is by introducing the green technology to the community. Many countries are concerning about the global warming, and finding ways on how to reduce it by implementing policy and awareness on green technology. The Green Technology Master Plan, GTMP creates a system which encourages the mainstreaming of green innovation into the arranged advancements of Malaysia whereas including the four columns set within the National Green Innovation Approach (NGTP) i.e. vitality, environment, economy and social (Ministry of Energy, Green Technology and Water). Green technology is a type of technology that is environmentally friendly and uses less energy than other types of technology (Dimash, 2011).

Green Product Awareness

Rafi (2003) conducted a research on perception of green products among consumers of east coast of Peninsular Malaysia in 2003. According to the study, high-educated users' awareness of environmentally friendly items is still low. The Green Technology sector focuses on providing green technology education and public awareness, as well as encouraging the widespread adoption of green technology (Ministry of Energy, Green Technology and Water, 2015). So many ways created as an initiative to create awareness. A study found that promotional activities on eco-friendly products influences consumer's green products awareness (Divyapriyadharshini et al., 2019).

Green advertising is valued by customers (Doni et al., 2020). It can boost customers' green awareness and their purchasing intentions for ecologically friendly products. In 2017, Alamsyah and Hariyanto (2017) in their study found that consumer awareness of the benefits of the environmental friendly product improved due to consumers' knowledge.

On the other hand, Norazah (2013) stated purchasing decision of green products has been influenced by consumers' awareness of price and brand image. The descriptive statistics results of a study conducted by Sarimah (2021) show that people in Sabah have a high level of environmental awareness and green product consumption.

Consumers are said to be concerned about the environment because of product qualities, the veracity of green product claims, and the information offered about the products and their benefits (Forkink 2010; Luchs et al. 2010). Nagamani and Navaneetha (2014) studied the awareness and use of green products among women students in Coimbatore in their research work, and the respondents had knowledge of green items such as paper bags, plates, cups, areca plates, and eco bowls in green marketing. Fadhlur and Haslinda (2018) study indicated knowledge of employees as the most influencing factors to the awareness of green practices.

Green Product Knowledge

Environmental knowledge often assumed as the main motivator of green consumer behavior (Peattie & Charls, 2011). Buyers who are more learned almost issues related to the environment and the benefits of utilising green items may have a more positive state of mind on these items (Bang et al., 2000). According to Muhammad et al. (2018), environmental awareness and knowledge have a substantial impact on business students' favourable sentiments about green automobiles.

According to Said et al. (2007), pupils are aware of some local environmental issues but lack knowledge of sustainable consumption practises. Consumers' product knowledge improved gradually through beneficial learning and experiences learning (Gursoy & McCleary, 2004; Hutchinson & Eisenstein, 2008).

Green product knowledge and green purchase intention were found to be related to green trust and perceived customer effectiveness (Wang et al., 2019). In the realm of new energy,

consumers' conviction that utilising new energy goods delivers positive benefits and can improve environmental performance or alleviate environmental problems grows as their understanding of new energy grows (Bang et al., 2000). When it came to the impression of green technology by ethnicity, it was discovered that there was a high level of awareness of the green technology-understanding component (Bokhari et al., 2014).

Johar (2013) discovered that students at Tun Hussein Onn Malaysia (UTHM) had a modest level of awareness of knowledge and practise. According to Gan et al. (2017), students agree that learning about green technologies can help them understand the necessity of practising green culture.

Another study, conducted by Ariffin (2013), indicated that teachers' attitudes were good, while their green practises were moderate. The data also revealed that there was no discernible variation in green technology knowledge between teachers with different areas of concentration. Researchers discovered that instructors' awareness and enthusiasm for green technology practises are still low, based on a thorough literature analysis (Talirkodi, 2020).

According to the findings of Alprida et al. (2018), there is a relationship between product knowledge and green buying behaviour, namely p (0.02) < 0.05, but no such association exists between purchasing and utilising knowledge and green buying behaviour. A study by Peattie and Charls in 2011 found that the main motivator of green consumer behavior is environmental knowledge.

Methods

The purpose of this pilot study is to get early information related to school's teacher awareness and knowledge level towards the use of green technology products in the daily life routine. This is a descriptive study. Total of 10 respondents were selected in August 2021 as a pilot tester. The questionnaire distributed to them through google form link during this pandemic sessions.

Questionnaire divided into 3 different sections. The first section related to background of the respondents such as age, salary, location and other demographics factors. Second section of the questionnaire related to school's teacher awareness level. Third section are questions related to their knowledge towards green technology.

Likert 5-scale were use in the questionnaire using 1 = very disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = very agree. Descriptive statistics used to determine frequency and percentage. The result for knowledge level were analysed using mean calculation. The scale used to measure the level of knowledge are '1-3 = Low', '3.1-4 = Fair' and '4.1-5 = High '.

Findings

Result for this pilot study analysed using descriptive methodology. Each table and figure explain the findings from the data collected from the questionnaire. Table 1 shows the result for the respondents' gender while Figure 3 shows the respondents' age. Respondents consist of one male and nine females. Most of the respondents age between 41-50 years old involved in this pilot study with a percentage of 60%.

Table 1: Respondents' Gender

Characteristics	Categories	Number	Percentage
Gender	Male	1	10%
	Female	9	90%

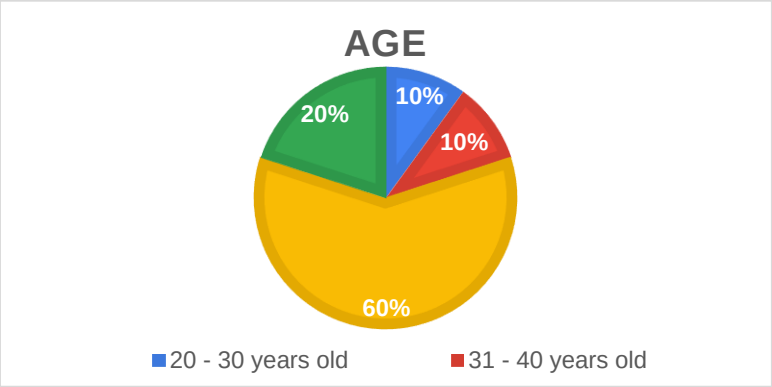

Figure 3: Respondents' Age

Table 2 represent the data related to respondents' education level and income level. A total of 80% of the respondents are degree holder with majority of them have income of above RM4000 per month.

Table 2: Respondents Education and Income

Characteristics	Categories	Number	Percentage
Education	Degree	8	80%
	Diploma	2	20%
Income	RM3,001- RM4,000	1	10%
	RM4,001 - RM5,000	4	40%
	> RM5,000	5	50%

Figure 4 summarise that majority of the respondents living in sub-urban area. Freedictionary.com define suburban as residential area or community outlying a city. Around 40% of the respondents comes from sub-urban area while 30% respondents comes from urban and rural area respectively. Table 3 shows monthly electricity bills range from below RM100 and more than RM200. Majority of the respondents less than RM200 electricity bills. Only 10% respondents spend more than RM200 per month.

Table 3: Respondents Location and Electricity Bills

Characteristics	Categories	Number	Percentage
Electricity Bills	≤RM100	3	30%
	RM101-RM150	3	30%
	RM151-RM200	3	30%
	≥RM201	1	10%

Part two of the questionnaire concerning on the awareness level of respondents towards the use of green technology products. In Table 4, it summarises that 90% of the respondents aware of the availability of green technology products in the market. In Figure 5, 70% of the respondents used green technology products in their daily routine. Among the products they are using includes electrical appliances with inverter features, biodegradable products, solar products and hybrid cars.

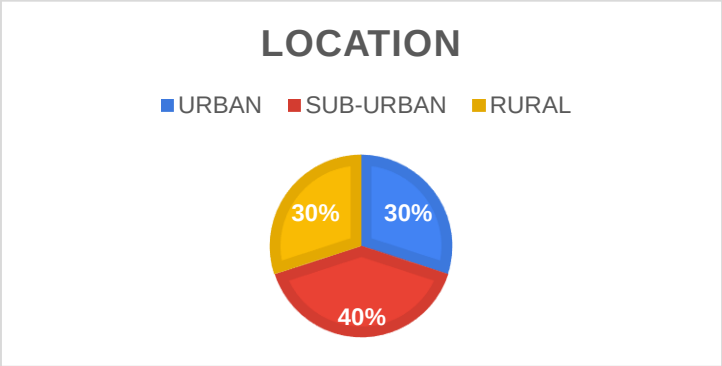

Figure 4: Respondents' Location

Table 4: Awareness on the availability of Green Technology Products in the Market

Categories	Number	Percentage
Yes	9	90%
No	1	10%

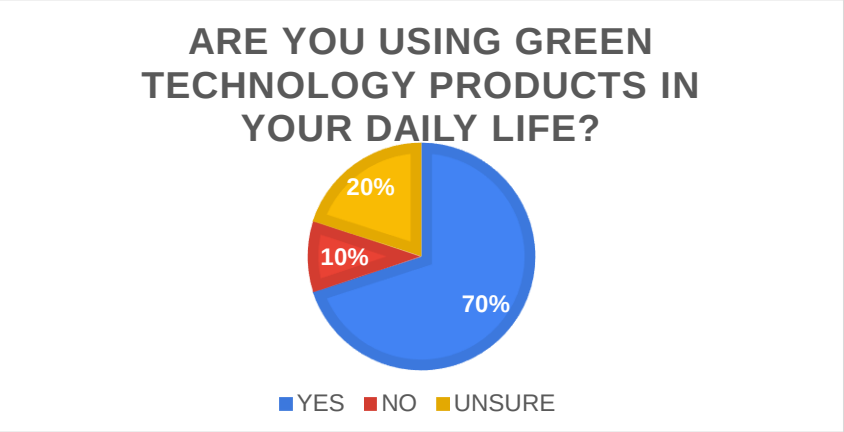

Figure 5: Usage of Green Technology Products

In the third section of the questionnaire related to respondents knowledge been asked. Table 5 explained the respondents' level of knowledge based on 13 questions. Overall result shows that, respondents have high knowledge toward green technology and its products with mean value of 4.08. Referring to the same table, seven questions concluded to achieve fair level of moderate respondents and another six questions been considered as respondents reached highest level of knowledge.

Green technology can ensure a healthy and good environment, minimise GRH, save vitality and non-renewable assets, limit negative effects of human movement, and realise that human action appears to contribute to bad effects on the environment, according to the respondents. Other than that, respondents also have a knowledge that green technology will have positive impacts to future generations. Other questions being rated as fair. Table 5 summarise the findings related to respondents' awareness and knowledge being rated as level 1-3 = Low', '3.1-4 = Fair' and '4.1-5 = High.

Table 5: Respondents' Level of Knowledge Relate to Green Technology (Appendix 1)

Question Number	Mean	Level
Q1	4.00	Fair
Q2	4.50	High
Q3	4.00	Fair
Q4	4.40	High
Q5	4.20	High
Q6	4.30	High
Q7	3.90	Fair
Q8	3.70	Fair
Q9	4.20	High
Q10	3.70	Fair
Q11	4.30	High
Q12	3.90	Fair
Q13	3.90	Fair
OVERALL	4.08	High

Discussion and Conclusion

Green technology product were there in the market for quite so long. Among the reason, why the products are not popular among the consumer is that, because lack of awareness and knowledge of the consumers related to the products.

As day goes by, the awareness and knowledge of consumers increased. This is due to several initiatives done by government, NGO and several activist in order to promote green technology to the public. Any other way is that, by looking at the awareness of the school teachers', perhaps this will become the platform for the ministry to educate students and educators on the benefits of green technology.

Practical and Social Implications

The awareness level of respondents towards the use of green technology products summarises that 90% of the respondents aware of the availability of green technology products in the market. The respondents' level of knowledge shows that, respondents have high knowledge toward green technology and its products with mean value of 4.08. Seven questions concluded to achieve fair level of moderate respondents and another six questions been considered as respondents reached highest level of knowledge. Comparing to a study done by Rafi (2003) on perception of green products among consumers of east coast of Peninsular Malaysia in 2003 where the study found that high-educated users' awareness of eco-friendly products is still low.

Limitations and Suggestions for Future Research

This study will be further distribute to the respondents in order to get a clear picture of the situations. Perhaps this pilot study will give a good start for the researcher to continue analysing the awareness and knowledge of the respondents. Among the limitations of the study is that we can guarantee that the answer reflects the true value of the results.

References

Alamsyah, D. P., & Hariyanto, O. I. B. (2017). Store image of organic product: Social responsibility and trust's mediator. *Cyber and IT Service Management (CITSM), 5th International Conference,* 1–4.

Alprida, H., Aminah, Z., Henita, R., Nadiroh. (2018), Relationship between knowledge of green product, social impact and perceived value with green purchase behavior, *ICSoLCA*, doi.org/10.1051/e3sconf/20187404002

Arifin, M.Z.A. (2015). Tahap kesedaran teknologi hijau dalam kalangan guru-guru Teknologi Kejuruteraan Zon Utara. (Dissertation). Universiti Tun Hussein Onn Malaysia

Bang, H.K.; Ellinger, A.E.; Hadjimarcou, J.; Traichal, P.A (2000). Consumer Concern, Knowledge, Belief, and Attitude toward Renewable Energy: An Application of the Reasoned Action Theory. *Psychol. Mark. 17*, 449–468.

Bokhari, M., Abdullah, A. N., Hassan, S. N. S., Jano, Z. & Saadan, R. (2014). Hubungan antara kefahaman, kesedaran dan amalan teknologi hijau berdasarkan Perspektif Etnik di Negeri Melaka. *Journal of Human Capital Development, 7*(2), 33-46.

Dimash, S.A.P. (2011). Dampak revolusi hijau bagi lingkungan program studi agribisnes. Indonesia: Fakulti Pertanian Universiti Lampang.

Divyapriyadharshini, N., Devayani, S., Agalya, V., & Gokulapriya, J. (2019) Consumer Awareness towards Green Products and Its Impact. *International Journal of Research and Innovation in Social Science (*IJRISS), III (X), October 2019|ISSN 2454-6186

Forkink, A. (2010). Perception, Awareness, and Acceptance of Green Kitchen Cleaners: Go Green Market Research. Online report. http://www.greenbook.org/Content/GoGreen/Green_Cleaners_report.pdf

Freedictionary.com

Gan, C.L., Rashidah, A. & Boey, H.M. (2017). The barriers to adoption of green technology by higher education institutions in Malaysia. MOJEM: *Malaysian Online Journal of Educational Management, 1*(3), 23-34.

Gursoy, D. & McCleary, K.W. (2004). An integrative model of tourists' information search behavior. *Ann. Tour. Res. 31*, 353–373.

Hutchinson, J.W. & Eisenstein, E.M. (2008), Consumer learning and expertise. In *Handbook of Consumer Psychology*; Haugtvedt, C.P., Herr, P.M., Kardes, F.R., Eds.; Lawrence Erlbaum Associates: New York, NY, USA.

Johar, S.R. (2013). Kesedaran teknologi hijau dalam kalangan warga Universiti Tun Hussein Onn Malaysia. (Dissertation). Universiti Tun Hussein Onn Malaysia

Krause, D. (1993). Environmental consciousness: An empirical study. *Journal of Environment and Behavior, 25*(1), 126-42.

Luchs, M. G. et al. (2010). The Sustainability Liability: Potential Negative Effects of Ethicality on Product Preference. *Journal of Marketing, 74*, 18–31.

Ministry of Energy, Green Technology and Water (2015). *Annual report 2015*. www.kettha.gov.my.

Ministry of Energy, Green Technology and Water (2017). MALAYSIA: Green Technology Master Plan 2017-2030. https://policy.asiapacificenergy.org/node/3437

MyHijau Mark - *Bring Together Certified Green Products in Malaysia https://www.testlabs.my/update-and-stories/myhijau-mark-bring-together-certified-green-products*

Moe L. (2019). *What is green technology and examples of its benefits?* https://www.electropages.com/blog/2019/09/what-is-green-technology

Monu, B. N. (2015). The Advantages and Disadvantages of Green Technology, *Journal of Basic and Applied Engineering Research, 2*(22), 1957-1960.

Muhammad M. , Abdullah A. M., Fazal A. S., Muhammad M. M. and Zhan S., (2018), Environmental Knowledge, Awareness, and Business School Students' Intentions to Purchase Green Vehicles in Emerging Countries, *Sustainability, 10*, 1534; doi:10.3390/su10051534

Nagamani, M. & Navaneetha, B. (2014). A study on Awareness and Usage of Green Products among the Women students-An Empirical Study. *Indian Journal of Applied Research, 4* (5), 85-87

Norazah M. S., (2013). Green Awareness Effects on Consumers' Purchasing Decision: Some Insight from Malaysia, *IJAPS, 9*(2)

Peattie, K. & Charls, P. (2011), Qualitative Market Research: An International Journal, 4, 8, 357-370

Shamdasani, P. et.al. (1993) Exploring green consumers in an oriental culture: role of personal & marketing mix. *Advances in Consumer Research, 20*, 488-493.

Said, A. M., Yahaya, N. & Ahmadun, F. R. (2007). Environmental comprehension and participation of Malaysian secondary school students. *Environ. Educ. Res., 13*, 17–31

Sarimah S., (2021). Environmental awareness and green products consumption behavior: A case study of Sabah State, Malaysia, *Biodiversitas, 22* (7), 2685-2692.

Talirkodi V., (2020) Green Technology Awareness and Motivation among Primary School Teachers. *International Journal of Instruction, Technology and Social Sciences, 1*(1).

Appendix 1

Table 5: Respondents' Level of Knowledge Relate to Green Technology

	Awareness and knowledge level 1-3 = Low', '3.1-4 = Fair' and '4.1-5 = High	**Mean**	**Level**
Q1	I know the importance of green technology to the environment	4.00	Fair
Q2	I know the green technology can guarantee a healthy and good environment	4.50	High
Q3	I know about the technology of green consumption to society, the country and the environment	4.00	Fair
Q4	I know that green technology can reduce Greenhouse Gas emission (GRH)	4.40	High
Q5	I know that using green technology can save energy and non-renewable natural resources	4.20	High
Q6	I know the use of green technology can reduce the negative impact of human activity	4.30	High
Q7	I know the types of green technology products or equipment	3.90	Fair
Q8	I know the implementation of the green technology campaign that has been introduced by the government	3.70	Fair
Q9	I know that the activities of humans do have a lot of negative effects on the environment	4.20	High
Q10	I know 'Green Building' and 'Go Green' have links with green technology.	3.70	Fair
Q11	I know the green technology will have a positive impact on future generations	4.30	High
Q12	I know the meaning of the sticker 'Energy saving' attached to electrical appliances.	3.90	Fair
Q13	I know green technology can promote renewable energy use.	3.90	Fair
	OVERALL	4.08	High