The Thing You Need to Know about Acceptance of Green Technology: A Case Study of Melaka Green City Initiatives

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Abstract

Nowadays, our world is moving towards a developed nation where the environment is critical to life on earth. However, there were several problems destroying life and the earth's ecosystem. It affects not only the climate but also everyone who lives on the planet. Furthermore, deforestation, global warming, greenhouse gas, and various other factors were major contributors. Corresponding to these issues, Melaka took an opportunity towards implementing green technology. The application of green technology will bring more positive impacts and benefits to the environment. This is because green technology products help produce energy in a greener way that will be able to make our planet safer for future generations. This research was about factors that affect acceptance of Green Technology. The factors were knowledge, perceived usefulness, attitude toward environment, and government policy and regulation. Meanwhile, the mediating variable was the intention to use towards acceptance of green technology. The results and data from the questionnaire survey were analysed by using SPSS and also SmartPLS. As for the results, the highest contributor towards acceptance of Green Technology acceptance was government policy and regulation. This research revealed that most Melaka citizens were concerned about Green Technology and all the government's programs that had been implemented. Therefore, this research has achieved the objective.

Keywords: Acceptance; Knowledge; Perceived Usefulness; Attitude towards environment; Government Policy and Regulation; Intention to Use; Green Technology; SmartPLS

1. Introduction

In the history of green technology, when it goes back to the pre-industrial revolution period of the seventeenth century, whereby windmills were used to operate looms and factories. Green Technology was an effort that grew around diverse methodologies, components, and resources enhancement—from energy generation methods to non-toxic cleaner products (Ministry of Energy, 2017). Many scientific studies and research had been done towards the application of green technology in many fields around the world. As green technology was not a new thing globally, green technology already became one of the crucial parts of the environment. This has been reflected in an accelerating social push for environmentally sustainable tools to diminish the effects of energy-intensive economic development. If before when people heard about green technology maybe they will be wondering what it is, but nowadays green technology, already famous around the world as its give more advantage towards environmental sustainability

Like other countries, Malaysia is also one of the countries that enforce the application and implementation of Green technology. There was a saying from Philip Green; "Good, bad or indifferent, if you are not investing in new technology, you are going to be left behind. Green technology can be described as a part of the application of science that attempts to protect and preserve the environment and minimise the harmful effects of human activity. sustainable technologies, It connects to including strengthening the social and environmental impact at any point of product life, from raw material extraction to the end of its life. (Bhowmik & Dahekar, 2014). It's also Green Technology assumed that was encouraging to improve viability in many fields while reducing destruction of the environment and protecting natural resources. Green technologies are renewable technologies that do not generate pollution or impact when used for numerous processes/applications (Aithal & Aithal, 2016).

According to Hasan & Zhang (2016), there was some critical barrier and challenges in implementing Green Technology. As per this study, it stated that few challenges towards green technology implementation was in term of economic, technology, awareness and also management. In economics, cost and time were the barriers as green construction needed additional cost and total time. Next, for the technology, the barrier was uncertainty in the production and operation of green technology materials and equipment. Meanwhile, for the awareness challenge, it depended on the government's promotion, as when government enforce more strategies and activity. The awareness will be increase or vice versa. Besides that, on another report of (Aithal & Aithal, 2016) also stated that few challenges in implementing green technology were considering the impact, consequences and even implications of the national green policies before making any suggestion towards the expansion of appropriate technology. So, even green technology was not a new thing, but there are still many challenges and barriers towards implementing this Green Technology. The more research and study could be done to explore more about Green Technology.

In Malaysia, Melaka was one of the earlier states that had been started the implementation of Green technology which was around 11 years ago. The government produced Melaka Green Technology City State Blueprint 2011 as the layout and outline towards achieving Melaka as a developed state with green city status (Green & Corporation, 2016). At the same time. Melaka also had their own Green Technology Council with three main objectives: i. To manage about Melaka state's policies on green technologies; ii. To form and manage the Melaka state's green technology growth and implementation; and lastly iii. To explore more about the Melaka state's green energy initiative and funding (GreenTech, 2018). Furthermore, as today technology became more and more sophisticated, all information is just around the fingertips; we just have to access the internet. Recently, Melaka Green Technology Corporation (MGTC) published on their Facebook pages regarding the latest news and activity of Green technology in Melaka. MGTC also advocates training green towards sustaining technology development in Melaka. Based on the previous research, Aimiuwu et al., (2017) around 72%-91% agreed that social media has a significant enhanced business processes, impact on increasing target market, and strengthening green technology.

In this research, the researcher found two main research problems: lack of knowledge about green technology and limited research about green technology (Wang et al., 2018; Ahmed, 2018; Wu et al., 2019). When people lack knowledge about green technology, it will Green decrease their awareness of Technology's concern. On the study of N. N. Ali et al., (2019) stated that in Melaka, knowledge was one of the factors that increase the awareness towards green technology, so if people have lack of knowledge, it will be difficult for them to accept green technology. Besides that, limited research in the green technology fields was one of the barriers among the people and industry. Even industry sectors to identify how green technology can benefit and how this technology can be adopted in the economy sector, especially in Malaysia (Malaysia Investment Development Authority, 2018). Based on this two main research problem researcher came out with objective.

This study aims to explore the acceptance of the green technology concept among Melaka citizens. To achieve the above aim, the researcher comes out with a research question as shown:

1: What are the mediating effect of intention to use towards acceptance of Green Technology?

2: Which is the most significant factor that affects Green Technology acceptance?

2. Research Model and Hypothesis

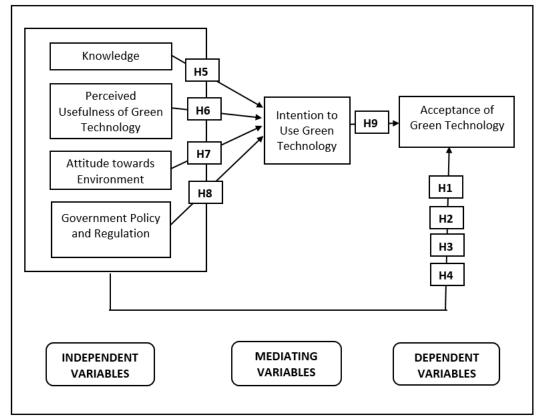


Figure 1: Proposed Research Model

2.1 Knowledge

Knowledge can be nominated as one factor that affects Melaka citizens toward awareness of Green Technology (N. N. Ali et al., 2019). According to past research by (Bolisani & Bratianu, 2018), knowledge was generated by the human brain and then expanded and transformed into corporate awareness through social experience. Objective attributes may be thought of as something independently of the social context. Meanwhile, the subjective attributes are context-based and cannot be readily translated to other related contexts. One quote says that "Knowledge is having the right answer. Intelligent is asking the right question". This shows that knowledge is power, and the knows knowledge is wiser. one who Technology should be easy, practical and not difficult for people to use due to their lack of understanding or expertise. The simpler it is to practice modern technologies, the quicker it is possible for people to adopt green technology

(Ramdhani et al., 2017). It shows that if people know how to use and practice green technology in their lives, it is easier for them to accept it as part of life.

 H_1 : Knowledge has a positive effect on acceptance of Green Technology

2.2 Perceived Usefulness

In this research, perceived usefulness is one of the factors adopted as factors that affect green technology acceptance. Perceived usefulness is one of the variables adopted from the Technology Acceptance Model (TAM) framework. These factors are one of the factors that were having a positive relationship towards green technology acceptance. Perceived usefulness can be defined as the extent to which people believe that a green technology will improve some part of their life (Davis et al. 1989). Besides that, there is also previous research that shows that perceived usefulness has positive significance towards acceptance. The study of office assistant applications showed that perceived usefulness and acceptance towards technology are positively related to each other's (Intan et al., 2020).

*H*₂: *Perceived Usefulness has a positive effect on acceptance of Green Technology*

2.3 Attitude towards Environment

The environmental attitude was reflected through the intellectual assessment and evaluation of individuals concerning environmental conservation (Cutter-Mackenzie, 2011). The main problem that affects a person to be conscious is perhaps the person's attitude concerning the concerns and issues. The contents of our behaviour are more like our acceptance of the concerns and underline the perception and intention of people (Saha, 2017). Some of the surveys suggested that people's attitudes show some concern for the environment, which indicates that the environmental stance becomes important (Kautish & Dash, 2017). All of these studies suggest that attitude towards the environment can make a person intend to use the technology. In short, the researcher concluded that environmental attitude could be one of the influences that motivate people to be more aware of green technology awareness. The greater the attitude towards the environment, the more optimistic the results.

H₃: Attitude toward Environment has a positive effect on acceptance of Green Technology

2.4 Government Policy and Regulation

One of the factors that can increase the awareness and acceptance of green technology is government policy and regulation(N. N. Ali et al., 2019). In order to achieve the Green Energy Policy goal, the Government also gives priority to all development to give more importance to environmental health. In agreement (Tahir, Rajiani and Muslan, 2015) the Malaysian Government has a significant role in green technology through launching and, at the same time, seeking to implement essential policies. To develop and incorporate a wide variety of renewable technology, the World Energy Council (WEC) and the Government are attempting to fulfil the needs of the coming years without harming natural resources. Governments will support creating state-of-theart sustainable technology and establish policy conditions that allow green energy companies

to get their goods into the market (Wira, Shafiei and Abadi, 2017). Once government takes place in the situation, its help to increase awareness towards green technology among people and companies.

H₄: Government Policy and Regulation has a positive effect on acceptance of Green technology

2.5 Intention to Use

In this research, intention to use had been used as the mediating variable. The main objective of this study is to find out the relationship between the knowledge that affect green technology towards the acceptance of green technology. Intention to use will be utilised as the mediating variables for this study. In this research, there are two probabilities for this study: whether consumers have a direct relationship between (knowledge, perceived usefulness, attitude towards environment, and government policy and regulation) towards acceptance or intention to use will be the mediating variables between the factors and acceptance. The previous study showed that intention to use is being used as the mediating variable to determine how individual values can affect the intention and attitude toward the acceptance of green products (Chen, 2014). I

*H*₅: Intention to use green technology will mediate the relationship between knowledge and acceptance of green technology

*H*₆: Intention to use green technology will mediate the relationship between perceived usefulness and acceptance of green technology

*H*₇: Intention to use of green technology will mediate the relationship between attitude towards environment and acceptance of green technology

H₈: Intention to use green technology will mediate the relationship between government policy and regulation and acceptance of green technology

H₉: Intention to use green technology has a positive effect on acceptance of green technology.

3. Methodology

The research design that the researcher had chosen for this study was Explanatory Research Design. As specified by (Saunders et al., 2016), explanatory research involves studying a scenario or issue to clarify the interplay of the factors. In agreement with (Chen, 2014) an explanatory study is used to acquire data on the scenario in which the factors engaged in the scenarios are included. For this study, researcher was on the topic of acceptance of Green Technology in Melaka. The concept of correlation is used to assess the anticipated relationship between the three main variables which is independent (knowledge, perceived usefulness, attitude toward environmental, and government policy and regulation), meanwhile for the mediating variables is intention to use and lastly the dependent variables (Green Technology acceptance). This study used quantitative research. The main focus of the quantitative analysis is on the validity and reliability issues necessary for testing theories, establishing facts and identifying the link between the factors in the study. Therefore, the researcher chooses the quantitative method as this methodological choice for this method. A questionnaire that had been using in this survey, which includes a template for the default question format and answering option that can be selected by the respondents. The answer question was designed by using the Likert Scale format that contains a five score rating. This scale enables the respondent to choose either to strongly disagree, disagree, neutral, agree, and strongly agree based on the question given. The sample size for this study was around 400 respondents who answered the question through hard copy and soft copy. This study was using two pain software which is SPSS and also SmartPLS. The results will be discussed in the next section.

3.1 Demographic Analysis

In this research, there were around 400 respondents that live in Melaka had been distributed the questionnaire survey. In Malaysia, Melaka was one of the earlier states that implemented Green technology around 11 years ago, in 2010. The first analysis for this research was a descriptive statistic on respondent demographics. This analysis had been done through SPSS.

Demographics	Frequency	Percentage (%)	
Gender			
Male	192	46.8	
Female	218	53.2	
Age			
18 - 25 years old	141	35.2	
26 – 49 years old	162	40.5	
50-64 years old	74	18.5	
65 years old and above	23	5.8	
Occupation			
Student	113	28.2	
Employee	232	58.0	
Unemployed	55	13.8	
Location			
Melaka Tengah	140	35.0	
Jasin	129	32.3	
Alor Gajah	131	32.8	
Know about Melaka as Green City			
Yes	381	95.2	
No	19	4.8	
Applying Green technology in daily life			
Yes	373	93.2	
No	27	6.8	
Application of Green Technology Used by			
Respondent			
Energy (save electricity)	349	87.3	
Waste Reduction (3R Practices)	203	50.7	

Table 1: Respondent Demographics

Transportation (Public transport / hybrid	186	46.5
car / bicycle)		
Water (Water Conservation)	217	54.2
Urban Environmental	273	68.3
(Biodegradable plastic / No		
polystyrene)		
Environmental Health	110	27.5
(Organic food)		
Never Use	8	2.0
Hear about Green Technology		
Television	304	76.0
Social networking	326	81.5
Websites	190	47.5
Radio	91	22.8
Newspapers	143	35.8
Magazines	36	9.0

Based on Table 1 above, it showed descriptive analysis on respondent demographic including gander, age, occupation, living area, known about Melaka as green city, applying green technology in life, application of green technology used by respondent, and lastly about heard from where about Green Technology. The total of the respondent that participated in this survey is 400. We can see that from 400, 192 are male respondents or 46.8%, and the female respondents who answer this questionnaire survey are 53.2% or 218 respondents. The highest age in this survey was 26 to 49 years old with 162 respondents or 40.5%. Three main areas in Melaka were Melaka Tengah, Alor Gajah and Jasin, and by relating to the result, the questionnaire was well distributed to the whole Melaka state. Around 95.2% people in Melaka known that Melaka was one of the green cities and only 6.8% didn't apply green technology as part of their routine life. Primarily respondents were using energy, urban environment and water as green technology applications. Simultaneously, the

most popular ways for the Melaka citizen to get information was through social networking, television and websites.

4. Result and Discussion

4.1 Measurement Model Assessment

In this part, the researcher will use SmartPLS software to measure the model assessment of the research. For this analysis, the researcher will analyse the reliability and validity through three main tests: internal consistency, convergent validity, and discriminant validity.

4.1.1 Convergent Validity

According to Hair, Ringle and Sarstedt (2011), composite reliability values from 0.60 to 0.70 in exploratory testing and values from 0.70 to 0.90 in some more advanced research are found to be acceptable, meanwhile for the values below 0.60 can be demonstrated as lack of reliability(Sarstedt et al., 2017).

First Order Construct	Second Order Construct	Outer Loading (OL)	Composite Reliability (CR)	Average Variance Extracted (AVE)
		>0.7	>0.7	>0.5
77.1	77 1 1	0.000	0.000	0.500
K1	Knowledge	0.802	0.909	0.589
K2		0.622		
K3		0.852		
K4		0.842		
K5		0.771		

Table 2 Convergent Validity

K6		0.735		
K7		0.726		
PU1	Perceived	0.606	0.871	0.534
_	Usefulness			
PU2	0.0010111000	0.852		
PU3		0.825		
PU4		0.738		
PU5		0.559		
PU6		0.760		
	Attituda	0.739	0.877	0.500
ATE1	Attitude	0.739	0.877	0.590
	towards			
	Environment			
ATE2		0.843		
ATE3		0.646		
ATE4		0.862		
ATE5		0.731		
GPR1	Government	0.792	0.911	0.594
	Policy and			
	Regulation			
GPR2	e	0.710		
GPR3		0.788		
GPR4		0.851		
GPR5		0.799		
GPR6		0.740		
GPR7		0.702		
INT1	Intention to Use	0.781	0.879	0.627
INT2		0.711		
INT3		0.844		
INT4		0.859		
INT5		0.798		
INT6		0.747		
INTO		0.747		
ACC1	Acceptance	0.792	0.909	0.626
ACC2		0.856		
ACC3		0.837		
ACC4		0.761		
ACC5		0.762		
ACC6		0.731		

Based on Table 2, it was showing the result of convergent validity. In this result, few criteria need to be highlighted, which is Outer Loading (OL), Composite Reliability(CR) and Average Variance Extracted (AVE). According to previous research, Fornell & Larcker (1981) stated that for a variable to had the convergent validity, all three criteria must be fulfilled; firstly the outer loading value must be greater than 0.7, AVE value must be greater than 0.5 and the composite reliability value must not less than 0.7.

Overall, for this study, mainly the outer loading value was between 0.7 to 0.8. But few items had outer loading of 0.6. In this case, the researcher did not remove the items as the value of AVE already more than 0.5 which meets the criteria needed. For the Composite Reliability (CR) for all six variables the value was greater than 0.7.

In short, all of these six variables meet the criteria of convergent validity.

4.1.2 Discriminant Validity

Discriminant Validity determines between the construct in the model are strongly correlated with each other or not. This Discriminant

4.1.2.1 Fornell-Larcker Criterion

validity test can be done through three main tests: Fornell-Larcker Criterion test and Heterotrait-Monotrait Ratio (HTMT) test. Nowadays, discriminant validity also became one of the standard practices in SEM studies (Henseler et al., 2014; Carlet, 2015; Hair et al., 2011).

	ACC	ATE	GPR	INT	K	PU
ACC	0.791					
ATE	0.234	0.768				
GPR	0.982	0.212	0.771			
INT	0.973	0.230	0.985	0.792		
K	0.417	0.215	0.381	0.384	0.768	
PU	0.435	0.200	0.396	0.380	0.570	0.731

Table 3 Fornell-Larcker Criterion

and

Notes: ACC = Acceptance, ATE = Attitude towards Environment, GPR = Government Policuy

Regulation, INT = Intention to Use, K = Knowledge, and PU= Perceived Usefulness

Table 3 showed results on Fornell-Larcker Criterion that had been used as one of the way to measure the discriminant validity. DV is evaluated by indicating that the square root of AVE values is associated and higher than other structures in Fornell-Larcker's criterion. In the diagonal matrix, the measurements of the AVE's square root values were greater than the off-diagonal values (Asadi et al., 2019). In short, it concluded that the results achieved the discriminant validity requirements and parameters.

4.1.2.2 Heterotrait-Monotrait Ratio (HTMT)

 Table 4 Heterotrait-Monotrait Ratio (HTMT)

	ACC	ATE	GPR	INT	K	PU
ACC						
ATE	0.248					
GPR	0.723	0.231				
INT	0.652	0.256	0.557			
K	0.459	0.221	0.419	0.417		
PU	0.485	0.219	0.441	0.416	0.643	

Notes: ACC = Acceptance, ATE = Attitude towards Environment, GPR = Government Policy and Regulation, INT = Intention to Use, K = Knowledge, and PU= Perceived Usefulness

Based on Table 4 showed the result of HTMT test that had been analysed for discriminant validity. According to Henseler et al., (2015), it was highly suggested to focus on variancebased SEM, the HTMT criterion for discriminant validity evaluation. The exact choice of standards depends on the construct of the model and how cautious the researcher in his or her estimation of the validity of discriminants. In short, the discriminant validity test, based on the HTMT calculation of (Henseler et al., 2014), showed that all HTMT values were significantly lower than 0.85 (Ali et al., 2018). As a result of this, confirming the discriminant validity of the measurements is accepted.

4.2 Assessment of Structural Model

4.2.1 Hypothesis Testing

Assessment of the structural model will be done once all the validity and reliability measurements had been done. The main reason <u>232</u>

to test this structural model is to find out the relationship between variables and predictive capabilities from Smart PLS. According to (Sarstedt et al., 2017), some procedures need to test the structural model, including the hypothesis testing and predictive accuracy test (R^2) presented as results from this study.

				-		
Hypothesis	Construct Prediction	β	SD	t	р	Result
H_1	$K \rightarrow ACC$	0.025	0.012	2.007*	0.045	Accepted
H ₂	$PU \rightarrow ACC$	0.043	0.013	3.384***	0.000	Accepted
H ₃	ATE \rightarrow ACC	0.014	0.011	1.339	0.181	Rejected
H_4	$\mathrm{GPR} \mathrm{ACC}$	0.770	0.081	9.510***	0.000	Accepted
H5	$\begin{array}{c} K \rightarrow INT \rightarrow \\ ACC \end{array}$	0.018	0.003	1.282	0.200	Rejected
H ₆	$\begin{array}{c} \text{PU} \rightarrow \text{INT} \rightarrow \\ \text{ACC} \end{array}$	0.025	0.003	2.312*	0.023	Accepted
H_7	$\begin{array}{c} \text{ATE} \rightarrow \text{INT} \rightarrow \\ \text{ACC} \end{array}$	0.014	0.003	1.552	0.121	Rejected
H ₈	$\begin{array}{c} \text{GPR} \rightarrow \text{INT} \rightarrow \\ \text{ACC} \end{array}$	0.983	0.078	2.344*	0.019	Accepted
H ₉	INT \rightarrow ACC	0.185	0.012	2.340*	0.02	Accepted

Table 5 Hypothesis Testing

Notes: ACC = Acceptance, ATE = Attitude towards Environment, GPR = Government Policy

and

Regulation, INT = Intention to Use, K = Knowledge, and PU= Perceived Usefulness

Based on Table 5, it was showing the results of hypothesis testing in this research. Based on the objective of this research was to find out the factors that affect Green Technology acceptance. This was the reason to analyse the relationship between independent variables, dependent variables and mediating variables by using hypothesis testing to answer the second objective of this research. In this research, a Bootstrapping method had been used to find the relationship between the variables (Hair et al., 2011). The results showed that H₁, H₆, H₈ and H₉ were accepted on a significance level of 5% where p <0.05. It showed that H_1 , knowledge was significantly accepted t (2.007), p=0.045 where p < 0.05. After that, it showed that perceived usefulness towards acceptance that mediated by intention to use was significantly accepted, t (2.312), p=0.023 where p <0.05. Next, it showed that H8, government policy and regulation towards acceptance mediated by intention to use was significantly accepted t (2.344), p=0.019, p < 0.05. After that, the intention to use towards acceptance, H9 also significantly accepted t (2.340), p=0.020 where p < 0.05.

Besides that, for the significance level of 0.1%, H_2 and H_4 were accepted with p < 0.001. For the H_2 it showed that perceived usefulness t (3.384) significantly accepted towards green technology accepted where p < 0.001. At the same time, H4 also revealed that government policy and regulation were significantly accepted towards green technology acceptance where t (9.510) and p < 0.001. Furthermore, the other hypothesis was not accepted, H3, H5, and H7, as the significance level is more than 0.05.

The predictive power of the research model had been evaluated using the coefficient of the determinative score. In short, R^2 significant value in SmartPLS maximises the variance explained in the endogenous variables (dependent variables). Based on the effect ranges, the range value for R^2 was from 0 to 1 to represent the predictive accuracy (Cheah et al., 2018; Kerdpitak et al., 2019). Based on this research, the value of R^2 of mediating variable which is intention to use was 0.972. This value is excellent as it was very close to 1. This means that the predictive accuracy is high for the mediating variables from the independent variable toward dependent variables. At the same time, the value of R^2 for acceptance of Green Technology was 0.969. This showed that dependent variables had an excellent predictive accuracy towards independent variables and mediating variables.

5. Conclusion

In conclusion, this research aimed to find out the relationship between factors that affect acceptance of Green technology. All the research objectives had been answered in this research. Since 2010, Melaka already became one of the first green cities that implemented green technology application in Malaysia. The mediating variable, which was the intention to use play an important role in mediating the relationship between the factors and the green technology acceptance. Based on all four factors, the most significant factors affecting Green Technology in Melaka were Government Policy and Regulation. This is because, in Melaka, the Government had implemented many programs and activities to increase awareness towards Green Technology.Moreover, Melaka also starts to collaborate with other countries in term of green Technology applications. Melaka citizens are also aware of this implementation as Government Policy and Regulation towards citizens and all the manufacturer, retailers, and many more. Melaka also had its own Melaka Green City Action Plan (GCAP) that is still enforced today.

5.1 Body of Knowledge Implication

On the other hand, throughout these findings, it could be stated that mostly Melaka citizens have already known about the green technology practised the government embraced that and unsurprisingly, many of them have already started to practice a green lifestyle in their daily life. It showed that people already aware and implemented green technology, which one of the signs indicated was ready towards the acceptance of Green technology. This research implication is also in terms of the body of knowledge. Through this research, the researcher came out with four factors that could affect the acceptance of Green technology: knowledge, attitude towards environment,

perceived usefulness, and government policy and regulation. Apart from that, by building up a literature review, the researcher also will be able to find more factors that could affect Green Technology acceptance.

5.2 Limitations and further research

The limitation that had been considered while completing this study was in terms of the quantitative method. The limitation can be seen when respondents just can answer the question based on the set of Linkert scale questions. This means that they will not have any opportunity to voice out their own opinion because they need to choose the answer stated in the questionnaire. This is the disadvantage while using a survey questionnaire in collecting data, as the interaction between the researcher and respondent was limited. Moreover, for future research, a qualitative method can explore more on perception and acceptance of Green Technology among the citizen. When the researcher conducts the qualitative approach, the researcher will get opportunities to communicate and interlink with the respondent as one way is by an interview with open questions. This will give the researcher more information than the answer given, such as in questionnaires. In addition, a previous study reported that when using the qualitative method, research may expose or disclose more evidence, facts, and clarifications of any relationship gained for the study (Zheng & Li, 2020). Apart from that, the researcher can also use mixed methods by combining the qualitative and quantitative methods.

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