



Factorising Green Practices Items

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Abstract

Green practices support Malaysia Government to become an advanced economy by accomplishing it in a resilient, low-carbon, resource efficient and socially inclusive manner. Many businesses especially manufacturing companies aim to achieve a sustainable business which can be achieved by successful implementation of green practices. This study aims to establish the green practices dimensions which focus on chemical manufacturing company. Questionnaires were distributed to the employees from middle to top level management in chemical manufacturing company. This study used multistage sampling technique and the data was analysed using partial least square (PLS), SmartPLS version 3. The findings shows that the nine dimensions of green practices which are waste management, sustainable resource management, sustainable design, cleaner production and resource efficiency, sustainable transport, eco-labelling, sustainable procurement, sustainable marketing and sustainable lifestyles are confirmed. It was found that all of the dimensions have AVE value higher than 0.5, composite reliability higher than 0.7 and loading higher than 0.7.

Keywords: Green practices, sustainable business, chemical manufacturing company

1. Introduction

Economic opportunities can be expanded as well as disaster risks can be enhanced by successful green practices (Eleventh Malaysia Plan, 2015). Organizations seeking to embrace sustainability must follow policies and standards which includes the environmental protection (Brockett & Rezaee, 2012). Mamat et al. (2012) agreed that humans are obliged to manage the environment, and thus have the ethical responsibility to address any harm that is committed on environmental entities. Organizations that practice green practices are anticipated to create shareholder value, gain public trust, build investor confidence and maintain sustainable performance (Brockett & Rezaee, 2012). Realizing the importance of green practices, Malaysia is promoting green practices as it will increase the business that are producing low-carbon and using energy effectively (Eleventh Malaysia Plan, 2015). Hence, the objective of the study is to factorize green practices items at chemical manufacturing company.

2. Literature Review

Green practices are practices that are applied by the organizations to save the environment by cutting back or eliminating the operations impacts on the environment (Linas et al., 2014). Hart (1995) stated that organization plays an important role in fostering green practices as a business should response to both mitigate environmental and social risks. Many authors have highlighted the importance of green practices in sustaining the organizations. As stated by Schoenherr (2012), green practices are valuable as they can contribute to company's competitive advantage. The influences of green practices on sustainable global supply chain management are necessary for many organizations to remain competitive (Pedersen, 2009). Thus, green practices are important for organization to sustain as the practices are valuable. Despite the importance of green practices in combating environmental

problems and generating economic benefits in complying organizations, available evidence shows that green practice is still not widely adopted in Malaysia (Tarig et al., 2010).

According to Eleventh Malaysia Plan (2015), the implementation of green practices is encouraged for manufacturing company. The manufacturing sector is an important sector in Malaysia as it contributed a high GDP and sales to the nation (Adebambo et al., 2013). Nowadays, the limitation of natural resources, environmental problem, and waste management issues challenge the manufacturing sector to stick to strict environmental regulations (Ghazilla et al., 2015). Hence, it is evident that industrial activities in Malaysia particularly manufacturing operations have huge implications towards the natural environment (Zaman, 2012).

The nine dimensions of green practices are explained as below:

Waste Management: Those action and activities in managing the waste from its inception to its final disposal (Glossary of Environment Statistics, 1997).

Sustainable Resource Management: The way of managing the natural resources sustainably (Australian Agency for International Development, 2012).

Sustainable Design: Sustainable product design which improve profit margin, benefits of the social, performance of the environment, market opportunities and quality of the product (United Nation Environment Program, 2016).

Cleaner Production and Resource Efficiency: The continuous application of preventive environmental strategy to processes, products and services to increase efficiency and reduce risks to communities and the environment (Network for Resource Efficient and Cleaner Production, 2016).

Sustainable Transport: Transport that is sustainable in the sense of climate impacts, social and environmental (Jeon & Amekudzi, 2005).

Eco-labeling: Label of products that have the long term goal of natural preservation with low detrimental environmental impact at

all stages of their life cycle (Organization for Economic Co-operation and Development, 2009).

Sustainable Procurement: Meeting business needs for materials, goods, utilities and services in an environmentally-friendly, responsible and ethical way (United Nation Environment Program, 2011).

Sustainable Marketing: Marketing activity that satisfies customers' needs, organizational goals and assure ecosystem compatibility (Fuller, 1999).

Sustainable Lifestyles: Ways of living that allow society to meet their aspirations and personal needs while allowing future and current generations to do the same (Backhaus, et al., 2012)

3. Methodology

One hundred and fifty questionnaires were distributed to 29 chemical manufacturing companies in Selangor which listed in Federation of Malaysia Manufacturing. The questionnaires were distributed to employees from middle to top management level from each department. One hundred and nine questionnaires were completed and returned back which make the 73% total of response rate. The questionnaires are divided into two main parts which the first part is demographic profile and the second part is the green practices. This research used five-point Likert scale.

In order to guarantee the content validity of the measurement in this study, experts in the field are requested to determine the suitability of the questions. The questions are validated by academic, experts from environment field and the discussion have been done with the employees representatives from the chemical manufacturing industry. The conclusion from the experts shows that the questions are suitable to be distributed to the middle to top level management employees in chemical manufacturing company.

4. Results and discussion

4.1. Measurement Model

The measurement instrument (reliability, convergent and discriminant validity) has been validated by the Partial Least Square (PLS) which is SmartPLS 3.0.

4.2. Reliability

Composite reliability is used to measure the internal consistency. As stated by Bagozzi and Yi (1988), composite reliability should be higher than 0.7. Table 1 shows that all composite reliability values are higher than 0.7 which ranging from 0.904 to 0.982. Thus it shows that internal consistency reliability is achieved.

4.3. Convergent Validity

The suggested loadings value for all items are 0.7 or higher (Fornell & Larcker 1981; Hulland 1999). Therefore for this study, 18 items which have the loading below 0.7 were deleted due to the low loading. Table 1 below shows the loading after the item with loading below 0.7 is deleted. The loadings of all remaining items range from 0.704 to 0.958

which exceeds the threshold of 0.7 as recommended by Fornell and Larcker (1981). According to Bagozzi and Yi (1988), composite reliability should be 0.7 or higher and average variance extracted (AVE) should be 0.5 or higher. From Table 1, it is found that all constructs achieve convergent validity as all of the average variance extracted (AVE) values are greater than the acceptable threshold of 0.5 (Wong, 2013; Fornell & Larcker, 1981) and the composite reliability is higher than 0.7 (Bagozzi & Yi, 1988).

4.4. Discriminant Validity

Discriminant validity was performed to show that all of the constructs were different from each other (Real et al., 2014). Fornell and Larcker (1981) and Real et al. (2014) stated that discriminant validity is evaluated by considering the correlation among the constructs. The square root of AVE of each latent variable should be greater than the correlations among the latent variable (Fornell & Larcker, 1981; Chiu & Wang, 2008). Based on Table 2, discriminant validity is achieved as each constructs relates more strongly to its own measures than others.

4.5. Path Coefficient

Based on Figure 1, it shows that the nine dimensions of green practices would give a positive influence. Based on the result, eco-labeling contributes the most to green practices determinant with the highest beta value which is 0.189. It is supported by Huang et al. (2013) which stated that when the path coefficient is positive, it indicating a positive influence.

5. Conclusion

Based on the findings, the result confirmed the nine dimensions of green practices which are cleaner production and resource efficiency, eco label, sustainable design, sustainable lifestyles, sustainable marketing, sustainable procurement, sustainable resource management, sustainable transport and waste management. Thus, the nine dimensions of green practices are important in combating the environmental problems especially in an organization.

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Appendices

Table 1: Result of confirmatory factor analysis

Construct	Items	Loading	CR	AVE	Construct	Items	Loading	CR	AVE			
Cleaner Production and Resource Efficiency	CPRE1	0.777	0.917	0.613	Sustainable Procurement	SP1	0.828	0.951	0.684			
	CPRE2	0.802				SP2	0.760					
	CPRE3	0.778				SP3	0.815					
	CPRE4	0.820				SP4	0.807					
	CPRE5	0.874				SP5	0.867					
	CPRE7	0.723				SP6	0.853					
	CPRE9	0.717				SP7	0.798					
Eco – Label	EL1	0.895	0.982	0.861		Sustainable Resource Management	SRM1			0.794	0.904	0.573
	EL2	0.936					SRM2			0.738		
	EL3	0.940					SRM3			0.758		
	EL5	0.941			SRM5		0.766					
	EL6	0.937			SRM6		0.811					
	EL7	0.958			SRM9		0.721					
	EL8	0.909			SRM10		0.704					
	EL9	0.918										
Sustainable Design	SD1	0.829	0.946	0.638	Sustainable Transport		ST2	0.776	0.953	0.720		
	SD2	0.827					ST3	0.868				
	SD3	0.812				ST4	0.837					
	SD4	0.778				ST5	0.782					
	SD5	0.731				ST6	0.876					
	SD6	0.718				ST7	0.915					
	SD7	0.844				ST8	0.854					
	SD8	0.788				ST9	0.870					
	SD9	0.794										
	SD10	0.856										
Sustainable Lifestyles	SL1	0.807	0.952	0.715	Waste Management	WM6	0.785	0.915	0.684			
	SL4	0.790				WM7	0.737					
	SL5	0.847				WM8	0.889					
	SL6	0.808				WM9	0.837					
	SL7	0.884				WM10	0.877					
	SL8	0.883										
	SL9	0.868										
Sustainable Marketing	SM1	0.826	0.964	0.750								
	SM2	0.879										
	SM3	0.895										
	SM4	0.887										
	SM5	0.891										
	SM6	0.894										
	SM7	0.810										

	SM9	0.849							
	SM10	0.857							

Note: Item WM1, WM2, WM3, WM4, WM5, SRM4, SRM7, SRM8, CPRE6, CPRE8, CPRE10, ST1, ST10, SM8, EL4, SP8, SL2, SL3 were deleted due to the loading below 0.7

Table 2: Discriminant validity using Fornell Larcker criterion

	1	2	3	4	5	6	7	8	9
1 Cleaner production and resource efficiency	0.783								
2 Eco-label	0.562	0.928							
3 Sustainable design	0.636	0.522	0.799						
4 Sustainable lifestyles	0.731	0.624	0.596	0.845					
5 Sustainable marketing	0.680	0.815	0.623	0.711	0.866				
6 Sustainable procurement	0.684	0.696	0.592	0.799	0.802	0.827			
7 Sustainable resource management	0.467	0.517	0.692	0.734	0.718	0.734	0.757		
8 Sustainable transport	0.809	0.609	0.419	0.533	0.575	0.651	0.456	0.848	
9 Waste management	0.670	0.406	0.541	0.649	0.491	0.588	0.725	0.381	0.827

Note: Values on the diagonal (bolded) are square root of the AVE while the off-diagonals are correlations.

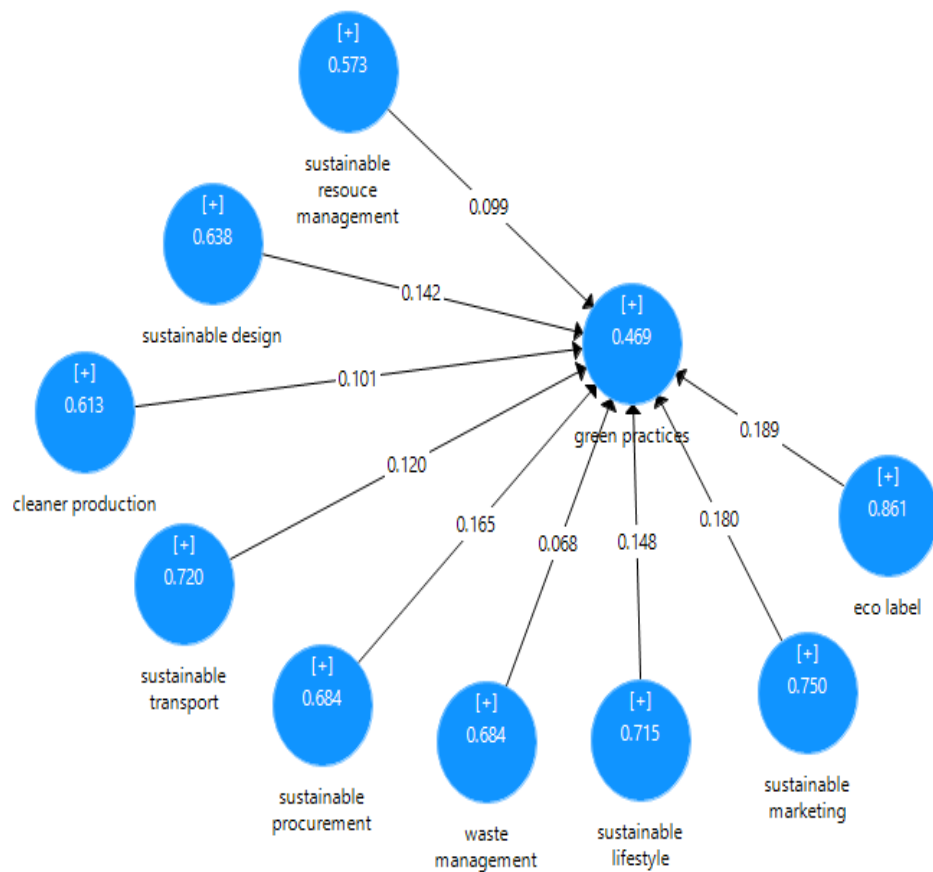


Figure 1: Path Coefficient