Investigating the impact of dynamic and relational learning capabilities on green innovation performance of SMEs

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A B S T R A C T

As a country that is quickly developing, the Malaysia government has shown serious commitment to green innovation performance. The government has continuous efforts in advancing the green technology in all small and medium enterprise (SME) sectors in Malaysia. This advancement aligns with the expectation that the green technology sector will be a key driver for improving the national economy through the promotion of sustainable development. Many companies from different sectors in Malaysia has been encouraged to adopt green innovation practices. SMEs that adopts green innovation strategies quickly would definitely obtain competitive advantages against their competitor. Thus, increasing green innovation performance will enable SMEs to increase their efficiency and effectiveness while maintaining its core competency. This research investigates the relationship between dynamic capabilities, relational learning capabilities, and green innovation performance. In addition, the research also investigated the mediation impact of relational learning capabilities between dynamic capabilities and green innovation performance. This study applied variance based equation modeling through partial least square to a sample of 249 from the manufacturing SMEs in Malaysia. The results suggest that there is a positive and significant relationship between dynamic capabilities and green innovation performance. In addition, the research found a positive and significant relationship between dynamic capabilities and relational learning capabilities. Moreover, there is also a positive and significant relationship between relational learning capabilities and green innovation performance. Furthermore, the research found that relational learning capabilities mediate the relationship between dynamic capabilities and green innovation performance. These results could enlighten owner/managers of SMEs manufacturing industry in adoption of green innovation performance practices especially from the dynamic capabilities and relational learning capabilities landscape.

1. Introduction

Unemployment occurs in rural areas or under Malaysia has registered significant engagement in advancing the green technology sector. This advancement aligns with the expectation that the green technology sector will be a key driver for improving the national economy through the promotion of sustainable development (Fernando and Wah, 2017). In Malaysia a significant number of companies have started to recognize innovative method for greener production, this means innovative ways to produce products and services without a negative impact on the environment which means the practice of eco-innovation. Malaysia' approach to green innovation corresponds with the importance of the environmental agenda that has received increased attention worldwide (Abdullah et al., 2016). Green innovation may be divided into green products and processes, which includes innovation in technologies to prevent pollution. Green has become increasingly become one of the important strategic methods to achieve sustainable development in manufacturing industries in alignment with increasing environmental pressure (Chang, 2011). As a fast developing country, the Malaysia government has shown serious consideration and commitment to adopt a

sustainability agenda (Hasan and Ali, 2015). Many companies from different sectors in Malaysia have been encouraged to consider adopting practices. The Malaysia Green Technology Policy gives five separate strategic areas to implement the 'Green Malaysia' framework along with green awareness promotions to increase public awareness and increase the intensification of research and innovation (Hasan and Ali, 2015). The Malaysia government further demonstrated its commitment to green innovation practices by instituting Green Technology Financing Scheme with an offering of RM1.5 billion in soft loans for companies that are interested in investing in green technology (Hasan and Ali, 2015).

2. Problem statement

In spite of its importance and benefits of green innovation, SMEs manufacturers' participation in green innovation performance remains low (Abdullah, et al., 2016). Moreover, low awareness of green innovation barriers prevents Malaysian manufacturing companies to engage in green innovation. According to Abdullah et al. (2016), investigating the potential barriers to green innovation in Malaysia is important due to its scarce discussion and limited literature. There are limited number of studies focused on the drivers and barriers that could either motivate or hinder the implementation of green manufacturing process in SMEs in Malaysia (Ghazilla et al., 2015). According to Seman et al. (2018), there are not many studies have been conducted on green innovation practices in Malaysia. Besides that, Malaysian manufacturing industry is in developing stages and may lead to negative environmental impacts. Hence, green innovation performance should be to accommodate the current environmental situation in Malaysia (Abdullah et al., 2016).

Therefore, it is crucial for future studies to identify the drivers and barriers of green manufacturing practices in SMEs in Malaysia (Abdullah et al., 2016; Ghazilla et al., 2015). In spite of that, Seman et al. (2018), argued that future research need to investigate and green innovation practices among Malaysian manufacturers. According to Albort-Morant et al. (2016), none of the past studies focused on the influence of the internal capabilities on green innovation performance. In addition, there are limited studies address how firms' internal capabilities influence green innovation performance. Likewise, not many empirical studies investigate the relationship between relational learning capabilities and green innovation performance in Malaysia. Moreover, as compared to the conventional innovation and new product development research; the study of green innovation is new in the academia and it is still a grey area. Therefore, this research examines the relationship between dynamic capabilities, relational learning capabilities and green innovation performance.

3. Literature review

3.1. Green innovation performance

The concept of green innovation refers to the opportunities to find a new market, continues development, maximizing values that leading to innovation and improves organizational performance (Albort-Morant et al., 2016). Albort-Morant et al. (2017) defined green innovation as "type of innovation whose main objective is to mitigate or avoid environmental damage while protecting the environment and enabling companies to satisfy new consumer demands, create value, and increase yields". According to Chen et al. (2014), the firm may develop an action plan that includes energy saving, pollution prevention, and green product designs to reduce waste recycling to improve environmental performance. Green innovation performance involves continuous improving product design during the manufacturing process to reduce the negative environmental damage (Dangelico et al., 2017). Previous scholars described the influence of green performance from different dimensions. According to Hepburn et al. (2018), policy funding has a significant positive impact on environmental innovation initiatives. Albort-Morant et al. (2017) argued that knowledge transfer plays an important role in promoting the green innovation performance. Horowitz et al. (2017) stated that communication, collaboration, and common willingness help to improve innovation performance. Fang et al. (2018) pointed out that green innovation performance influenced by driving factor and decision factors. Effective managers develop an organization through creating values, continuous innovation to achieve competitive advantage upon rivals. Hence, there are various factors influencing a firm green innovation performance such as communication, knowledge exchange and dynamic capabilities.

3.2. Dynamic capabilities and green innovation performance

Albort-Morant et al. (2016) indicated that dynamic capabilities have a positive indirect effect on company green innovation performance. Scholars distinguished between two types of organizational capabilities including dynamic capabilities and operational capabilities (Winter, 2003; Zollo and Winter, 2002). The dynamic capabilities of an organization are (first-order) relate to innovation that transforms organizational ordinary capabilities of the product and production process to the creation of new (Winter, 2003; Zollo and Winter, 2002). The operational capabilities are (zero-order) routine focus on daily routine and operational level such as "how we earn a living now" (Winter, 2003; Zollo and Winter, 2002).

There are three components of dynamic capabilities including integrating capability, learning capability and reconfiguring capability (Lin and Wu, 2014). These capabilities increase organization

performance and enhance its competitive position (Lin et al., 2016). Dynamic capabilities increase organization confidence and assist in improving green innovation performance. However, there is still a lack of research exploring the relationship between dynamic capabilities and green innovations (Bhupendra and Sangle, 2015; Gabler et al., 2015). Based on the discussion the following hypothesis was developed.

H₁: Dynamic capabilities has a significant positive impact on green innovation performance

3.3. Relational learning capabilities and green innovation performance

Relational learning activities represent "an ongoing joint activity between the customer and the supplier organizations directed at sharing information, making sense of information, and integrating acquired information into a shared relationship-domain-specific memory to improve the range or likelihood of potential relationship-domain-specific behavior" (Albort-Morant et al., 2016). According to Alegre and Chiva (2013), organizational learning ability improves firm capabilities such as new product development or focus on market assessment. Chiva and Alegre (2009) identified five factors of learning capabilities that influence organizational performance including (experimentation, risk-taking, interaction with the environment, dialogue, and participative decision-making). Hence, organizational learning capabilities have a positive influence on firm performance (Alegre and Chiva, 2013).

Chahal and Bakshi (2015) found that organizational learning moderates the relationship between intellectual capital and competitive advantage. Furthermore, creating supportive learning facilities for employees' by implementing innovative technologies, appropriate strategies and policies enhance organizational performance that leads to a sustainable competitive advantage in the changing environment (Chahal and Bakshi, 2015). The organization that develops a strategic structure based on knowledge exchange system and learn from experience from all partners thereby improving organizational performance (Leal-Millán et al., 2016). Further added that an organization that foster an environment that supports learning and knowledge across stakeholder improve organizational performance. Handfield et al. (2015) argued that joint activities enhance organizational performance through product improvement and new process innovations. Furthermore, Bossink (2018) found that knowledge flow mechanisms have a positive impact on sustainable innovation in a project-based industry contributing to improving company performance. Hence, developing collaboration networking between the organization and stakeholders is essential to stimulate sustainable innovation (Kazadi et al., 2016). According to Leal-Millán et al. (2016), exchange of information and experience between external agents is important for green innovation performance. Hence, relational learning capabilities are an important element to develop green innovation performance. Based on the discussion the following hypothesis was developed.

H₂: Is there a relationship between relational learning capabilities and green innovation performance

3.4. Mediating effect of relational learning capabilities

Relational learning capabilities are the process of developing the relationship between customer and suppliers by sharing knowledge and making sense of information (Leal-Millán et al., 2016). Gomes and Wojahn (2017) argued that developing organizational capabilities required knowledge sharing and collaboration from both internal and external environment, which contribute to new innovation. Furthermore, He et al. (2018) stated that organizational learning ability and the capabilities of understanding external environment enhance organization innovation performance. The organizational learning capability is essential to match organization capabilities with the dynamic environment and respond to new changes (Inan and Bititci, 2015). Accordingly, Leal-Millán et al. (2016) argued that the relevance relational learning plays an important role in developing green innovation performance. Developing dynamic capabilities in order to attract new knowledge is crucial for the organization (Hashim et al., 2015). Successful collaboration and knowledge exchange with external stakeholders lead to fruitful green innovation (Leal-Millán et al., 2016). In contrast, the lack of necessary knowledge and dynamic capabilities impact negatively on fostering green innovation performance (Cainelli et al., 2015). Hence, collaboration generates knowledge and experience that enhance organizational capabilities to green innovation performance. Developing relational learning capabilities benefit an organization in to acquire dynamic capabilities and assist green innovation performance to survive in changing the environment. Hence, the following hypothesis is proposed

H₃: Relational learning capabilities mediate the relationship between dynamic capabilities and green innovation performance

3.5. Green innovation performance and resource-based view (RBV)

Green innovation is regarded as an environmental strategy by the firm which could result in positive between firm environmental performance and investment of resources (Trumpp and Guenther, 2017).

According to the win-win hypothesis, the RVB, and NRVB proactive environmental activities leads

to superior green innovation performance of the firm. Furthermore, The NRVB which is based on RBV follows that the ability to addressing environmental aspects of the firm such as green innovations improves the firm's capabilities (Trumpp and Guenther, 2017). Companies consider going beyond regulatory compliance, and focus on the redesign of products and technologies are those that pursue proactive environmental strategies. These proactive strategies require organizational learning (capabilities) within the understanding of the RBV and therefore can result in superior green innovation performance (Trumpp and Guenther, 2017). In the current research, green innovation activities have been conceptualized as a bundle of resources to leverage green innovation performance. The green innovation activities can, therefore, be explained using RVB theory in that a firm's resources can be utilized to improve firm growth

3.6. Dynamic capabilities and resource-based view (RBV)

The underpinning theory of this research is Resource-Based View (RBV). The extant literature provides ample evidence of various underpinning theories used to support the theoretical models of green innovations. Three theories have been largely used to support research on green innovations (Tariq et al., 2017). The main theories used by many researchers are RBV, Institutional Theory, and stakeholder theory. However, RBV is widely used and frequently used theory in green innovation research (Tariq et al., 2017). RBV suggests that firm with better, unique non-imitable resources and capabilities are likely to perform better. RBV suggests the differences in resources is linear to the difference in firm performance. Resources are those readily available assets possessed by the firm to provide products or services while on the other hand capabilities refer to the firm's capacity to deploy the resources (Tariq et al., 2017). RVB is used in empirical research to explain the changes in the performance of the firms that adopt and implement green innovation strategies. As a theoretical underpinning, Li (2014) suggested that different levels of resources or kinds of resources result determines the kind and level of performance, and the allocation of sufficient resources is important for the success of green innovation practices (Tariq et al., 2017; Roni et al., 2017). Dynamic capabilities are therefore needed for the capabilities to create, deploy, and protect the firm's intangible resources for the achievement of long-term business performance especially in a changing environment (Tariq et al., 2017).

3.7. Relational learning capabilities and resource-based view (RBV)

Relational learning capabilities is defined as the bundle of interrelated processes possesses and to assess the firm's need for the staff training, and to

conduct an analysis of firm's failure to communicate lesson of past experiences across the firm while learning new relevant knowledge for conducting business activities (Lages et al., 2009; Sok et al., 2013). Learning capabilities has been used as an important index to measure competitiveness firms that include SMEs. Furthermore, learning capabilities can increase or promote SMEs ability to identify and respond to market cues in a better and faster mode and cheaper than competitors while serving to underpin SMEs competences required to develop new products (Lages et al., 2009). Learning capabilities enable SMEs to gain greater opportunities to achieve superior performance (Lages et al., 2009).

Additionally and critically, learning capability also enables SMEs to identify new strategies as well as channels or networks to work more closely with customers, which in turn enables SMEs to differentiate themselves from their competitors (Lages et al., 2009). RBV as an underpinning theory has been widely used as a theoretical base to that provides a good understanding of how firm's tangible and intangible resource can drive the firm performance (Lages et al., 2009). As a distinct capability that is required for superior firm performance, learning capabilities is one such core capability in driving firm performance Albort-Morant et al. (2016), Lages et al. (2009) and Sok et al. (2013). As RVB refers to better, unique non-imitable resources and capabilities, learning capability is one such capability that promotes firm competitiveness that ultimately leads to superior firm performance (Lages et al., 2009).

Based on the literature review and gaps in the research the conceptual framework (Fig. 1) was developed.
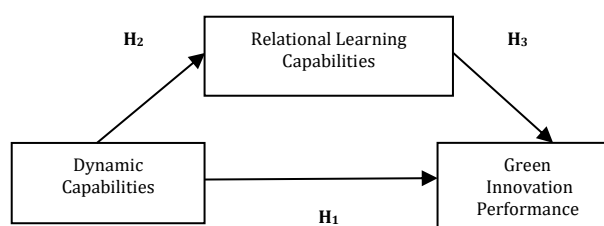

Fig. 1: Conceptual framework

4. Research methodology

4.1. Data collection

According to Habidin et al. (2017), top managers especially SMEs makes decisions regarding the manufacturing practices and implementing certain quality program. As such the research data was collected from the owner/managers of SMEs in manufacturing sector in Malaysia. Manufacturing companies operating in Malaysia, which are mainly large companies approximately 1500 large-scale of multinational corporations listed in the Federation of Malaysian Manufacturers (FMM) industries (Abdullah et al., 2016). As such, around 1500 one

thousand five hundred (1,500) questionnaires were distributed to owner/manager of Manufacturing SMEs in Malaysia. Nevertheless, only 256 questionnaires were received giving a response rate of 17 percent. After the data cleaning process and further testing; only 249 questionnaires were found useable for further analysis.

4.2. Measures

The study used five (5) point Likert scale ranging from strongly disagree to strongly agree to measure each construct. The dynamic capabilities measure with 17 items were adopted from (Pavlov and El Sawy, 2011). While the relational learning capabilities measure with seven (7) items were adopted from (Selnes and Sallis, 2003). Table 1 displays the instruments used for the research and its source. Finally, green innovation performance measure with four (4) items were adopted from (Chen et al., 2006). The theoretical framework design of the research is based on reflective model consisting dynamic capabilities; relational learning capabilities and green innovation performance.

Table 1: Research instruments

	Construct	Items	Source
1	Dynamic Capabilities	17	(Pavlov and El Sawy, 2011)
2	Relational Learning Capabilities	7	(Selnes and Sallis, 2003)
3	Green Innovation Performance	4	(Chen et al., 2006)

4.3. Data analysis

The research utilized Smart Partial Least Square (PLS) structural equation modelling technique to test the research framework. There are several reasons for choosing PLS analysis. According to Reinartz et al. (2009), PLS technique is suitable when the number of observations is lesser than 250. In addition, when the research is complex, in the first and high order constructs; in testing the direct effects and indirect or mediated relationships. The research used the latent construct scores to analysis the predictive relevance as suggested by Hair et al. (2011). The initial analysis was tested and confirmed through Smart PLS 3.0 software. The data was analyzed using two-step approach suggested by Hair et al. (2013); the first step consist evaluation of the measurement model; while the second step involves testing the reliability and validity of the measures. In addition, convergent and discriminant validity was also assessed. This is followed by assessment of the structural relationship of the model. Hence, the research combined the weights of items for each construct through PLS algorithm to generate the latent variable score.

4.4. Measurement model

The measurement model assessed the reliability and validity of the measures. Table 2 displayed the reliability and validity of the measures. Hair et al. (2014) suggested that the outer loadings should be greater than 0.707 then only the measures are considered valid. In addition, the composite reliabilities should be more than 0.7 in order to be reliable (Nunnally and Bernstein, 1994). Moreover, the convergent validity could be established through average variance extracted (AVE) results over 0.5 (Fornell and Larcker, 1981).

In addition, the discriminant validity was assessed through Fornell and Larcker (1981) criterion and Heterotrait–monotrait (HTMT) correlations (Henseler et al., 2015). The Fornell and Larcker (1981) criterion was established by comparing the square root of AVE correlations results. According to Fornell and Larcker (1981), the diagonal elements should be greater than the off-diagonal elements in the respective rows and columns. In addition, the average (HTMT) ratio of correlations scores should be lesser than 0.85 in order to establish the discriminant validity. Based on the measurement test the outer loading of all constructs were above 0.7 displayed in Table 3, following based on (Hair et al., 2014). Based on these results the validity of the measurement was established. The composite reliability scores of all constructs were above 0.7 following the suggestion of Nunnally and Bernstein (1994). Based on these result the reliability of the measurement was established.

The convergent validity for the construct was assessed through AVE scores which were all above 0.5 as suggested by Fornell and Larcker (1981). In order to assess the discriminant validity, Fornell and Larcker (1981) criterion and Heterotrait-monotrait ratio of correlations (HTMT) was used.

Based on the results in Table 4, the diagonal elements were greater than the off-diagonal elements in the respective rows and columns. In addition, the (HTMT) correlation ratio were used to evaluate the average of the Heterotrait-monotrait ratio of correlations (HTMT). Based on the results in Table 4. The HTMT scores were all below 0.85. Hence, the measurement model satisfied for further testing.

4.5. Structural model results

The research evaluates the structural model based on algebraic sign, magnitude and the structural path coefficients. Table 5 illustrates the variance (R^2) in the endogenous variables and the path coefficients for the direct relationship (mode 1) and with mediating effect (model 2) of the two models in the under study. Based on Hair et al. (2011) suggestion, the research has run a bootstrapping procedure (5000 resamples) to identify the standard errors and generate the t-values. The R^2 scores assess the strength of the predictive model.

Table 5 illustrates the R^2 scores for the endogenous construct and path coefficient for the direct (model 1) and mediation effects based on

model 2. The results suggest that strength of the predictive model is 45.0 % of the variance in between dynamic capabilities and green product innovation. While the strength of the predictive indirect model is 80.6 % between dynamic capabilities, relational learning capabilities and green innovation performance. The research hypothesis was all supported.

Table 2: Measurement model

Construct	Loading	Composite Reliability	Cronbach alpha	AVE
Dynamic Capabilities		0.937	0.924	0.622
DC11 <- DC	0.759			
DC12 <- DC	0.736			
DC14 <- DC	0.841			
DC15 <- DC	0.714			
DC2 <- DC	0.753			
DC4 <- DC	0.794			
DC6 <- DC	0.861			
DC7 <- DC	0.849			
DC8 <- DC	0.778			
Relational Learning Capabilities		0.885	0.805	0.72
RLC1 <- RLC	0.689			
RLC2 <- RLC	0.915			
RLC4 <- RLC	0.702			
RLC5 <- RLC	0.865			
Green Product Innovation		0.874	0.805	0.639
GIP1 <- GIP	0.873			
GIP2 <- GIP	0.815			
GIP4 <- GIP	0.855			

Table 3: Discriminant validity

Forner-Larcker Criterion	DC	GIP	RLC
DC	0.789		
GIP	0.644	0.848	
RLC	0.723	0.585	0.799

Table 4: Heterotrait–Monotrait ratio (HTMT)

	DC	GIP	RLC
DC			
GIP	0.734		
RLC	0.828	0.709	

Based on the results in model 1, there is a positive and significant relationship between dynamic capabilities and green innovation performance (β = 0.467, t-value = 6.694). Nevertheless, with the presence of relationship learning capabilities as mediator it appears there is no the direct relationship between dynamic capabilities and green innovation performance. Based on model 2, there is a positive and significant relationship between dynamic capabilities and green innovation performance, however the coefficient value is lower as compared to model 1 (β = 0.181, t-value = 3.613). The results provided support that relational learning capabilities mediate relationship between dynamic capabilities and green innovation performance.

Table 5: Structural model results

	Model 1				Model 2				
	R2 (GIP) = 0.445				R2 (GIP) = 0.802				
					R2 (GIP) = 0.903		Percentile Bootstrap Lower	95% CI Upper	
	Relationships	Path coefficient	Support		Relationships	Path coefficient			Support
H1	DC -> Green Per	0.467* (6.694)	Yes	H1	DC -> Green Per	0.181* (3.613)	0.564	0.716	Yes
H2	DC -> RLC			H2	DC -> RLC	0.725* (18.082)	0.647	0.794	Yes
H3	RLC -> Green Per			H3	RLC -> Green Per	0.249* (3.730)	0.122	0.375	Yes

* denotes P < 0.05

Based on the results in Table 5 the indirect effect of dynamic capabilities on green innovation performance is positive and increase with the relational learning capabilities presence. The bootstrapping confidence interval of 95% for the indirect effect should be greater than zero (Baron and Kenny, 1986). Hence, it is evident that learning capabilities mediate relationship between dynamic capabilities and green innovation performance.

5. Theoretical implication

Our research findings reveal that dynamic capabilities have a positive and significant influence on green innovation performance. The results are in line past studies who found a direct relationship between dynamic capabilities and green innovation performance (Albort-Morant et al., 2016; Chen et al., 2006).

Moreover, the research found that there is a direct relationship between relational learning capabilities green innovation performance. The results are similar with previous studies by (Albort-Morant et al., 2016; Chen et al., 2006).

In addition, the research found that relational learning capabilities mediate the relationship between dynamic capabilities and green innovation performance; this results are similar with previous study by Albort-Morant et al. (2016).

Based on RBV theory dynamic capabilities are SMEs internal strength that could improve green innovation performance. Nevertheless, SMEs need to revisit their internal strength to see whether it is fully utilized to enjoy maximum performance. Moreover, to stand in in the global competition SMEs must see whether their intervention strategies are working according to plan; or they need fine tuning. Relational learning capabilities are also important; because it creates sustainable competitive advantage for the SMEs. In order for SMEs to have a competitive advantage they must have the capacity to identify and grab market opportunities rapidly. Therefore, relational learning capabilities is one of many tools that can be used for business insights which could flourish business performance.

5.1. Managerial implications

Hence, owner/managers of SMEs in Malaysia needs engage themselves in innovation strategies that could transforms organizational capabilities such as product and process to create a new enhanced product quality which would increase their competitiveness in the market. In addition, through innovation, SMEs could improve their product quality and improve their brand image, which will increase their financial performance. Moreover, with high dynamic capabilities SMEs can improve the efficiency and effectiveness of their daily operation. Dynamic capabilities also have a significant impact to the local and global markets. Currently people awareness and preference towards green product has increased worldwide. Presently, there is a high demand for green product, which are finished through environment friendly process. The SMEs financial performance could also increase, due to the local and international demand. Despite that most of the developed countries throughout the world demands green product; which would increase green product exports. According to Ghazilla et al. (2015), SMEs in Malaysia are lacking research and development; resources and technical expertise to engage in green innovation practices. Therefore, it is crucial for the owner/managers for SMEs to keep aside some of their yearly income to increase the green performance. This is one opportunity for the SMEs in Malaysia to stay ahead in their competitiveness in green innovation performance.

SMEs also need to work on its relational learning capabilities by continuous engagement with stakeholders (staff, supplier and customer) in order to understand the market trends and demands. Traditional strategies do not work in the digital era; companies can no longer work in isolation. The digitalized era also removes all business barriers as such customer can do shopping with ease. As such; SMEs in Malaysia also need to have a good partnership so that they could leverage their expertise and create unique products for their customers. Moreover, SMEs could reduce experimentation and research and development risk by buying or leasing technology and expertise.

In spite of that, SMEs owner/managers must adapt their manufacturing strategy towards environment friendly processes. In addition, SMEs must allow participative open dialogue from time to time; to gain feedback from staff on green innovation activities. Although dynamic capabilities are important and have significant relationship with green innovation performance; relational learning capabilities mediates this relationship. Hence, it is important for SMEs owner/manager to learn further relationship learning capabilities to have a better green innovation performance.

5.2. Policy implication

Policy makers must encourage SMEs participation; especially in green innovation performance campaign. Policy makers could come up some policy for better tax deduction for SMEs which practice green innovation. This will encourage more firms to practice green innovation. On the other hand, policy makers could also create awareness in public regarding green product which is not only healthy but also environmentally friendly. Therefore, government support in green innovation would make change public mindset and preserve the nature.

6. Conclusion

Green innovation performance has gained popularity around the world (Albort-Morant et al., 2017) despite that it is not a well-researched area for SMEs in Malaysia (Abdullah et al., 2016; Ghazilla et al., 2015). The research has extended Albort-Morant et al. (2017) research model based on manufacturing SMEs in Malaysia context. The research, collected a sample of 249 respondents from owner/managers for manufacturing in Malaysia. The research found that there is a positive and significant relationship between dynamic capabilities and green innovation performance. In addition, the research found that there is a direct relationship between relational learning capabilities green innovation performance.

Furthermore, the research also found that relational learning capabilities mediate the relationship between dynamic capabilities, and green innovation performance. The research extends the current body of knowledge in the green innovation performance in Malaysia. This research was a cross sectional in nature. Therefore, it limits the ability to imply causality in the relationships among the variables. The survey was conducted on SMEs in Malaysia; as such due to different culture, the impact of green innovation performance could be different in other countries. As such, future research could replicate these studies in different culture and organization context.

Future research could also expand the present theoretical framework by looking at the impact of

different independent variable against green innovation performance. Future research could also identify, other moderating or mediating factor that could influence the relationship between green capabilities and green innovation performance.

Compliance with ethical standards

Conflict of interest

The authors declare that they have no conflict of interest.

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