

Available online at www.sciencedirect.com

ScienceDirect

Procedia - Social and Behavioral Sciences 195 (2015) 463 – 472

Procedia
Social and Behavioral Sciences

World Conference on Technology, Innovation and Entrepreneurship

State of the Art of Sustainable Development: An Empirical Evidence from Firm's Resource and Capabilities of Malaysian Automotive Industry

Nlizwa Rashid^{a*}, Juhaini Jabar^a, Salleh Yahya^a and Sayed Samer^a^aFaculty of Technology Management & Technopreneurship, Universiti Teknikal Malaysia Melaka, Malaysia

Abstract

In the 21st century, sustainable development play a pivotal role since the commitment towards sustains competitive advantage broader to triple helix performance. Although manufacturing industry is recognized as the heart of nation development, but it's imposed to the causes of a natural disaster. Thus in the new millennium, eco product innovation became a buzz word to leverage firm's environmental performance, values creation and social development. Firm's resource and capabilities are recognized as a firm's strategic weapons to success on reducing carbon footprint. In a nutshell, Firm's capabilities relies on *technology collaboration, green human resource (GHR) and, eco culture*, meanwhile, at the heart of resource view, firms embraced *formal EMS and top management support* as a drivers to attain sustainable development as well as eco product innovation. Sample data was collected from 320 respondents comprised of a Small, Medium (SME) and Large Corporation which derived from an automotive industry in Malaysia due to a progressive commitment towards green initiatives. The proposed model and related hypotheses were tested by using the Structural Equation Modelling (SEM) techniques. To conclude, the proposed factors play an important role on crafting sustainability and eco product innovation efforts. Further, eco product innovation was crucial to mediate the relationship between Green human resource (GHR), technology collaboration and formal EMS to realised sustainable development

© 2015 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Peer-review under responsibility of Istanbul Univeristy.

Keywords: Automotive Industry, Sustainable development, Eco product innovation, resource base view, dynamic capabilities

*Corresponding author. Nlizwa Rashid, Tel.: 0197578312
E-mail address: nlizwa84@yahoo.com

1. Introduction

The cases of natural disaster increase tremendously since 50 decades and this trend has reached the alarm rate in 21st century. Therefore, Brundtland report 1987 and ECO 92 were released to increase world-wide awareness on the concept of sustainable development to enable “the ability of current generation to meet their needs without compromising the ability of future generations to meet theirs” (WCED 1987).

Generally, terms of eco innovation relatively associated with an ecological, environmental, green and sustainable innovation (Schiederig et al. 2012)(Rashid et al. 2015) (Rashid et al. 2014) and its prone to triple helix performance in terms of economy, ecology and social development specially in the manufacturing industry. Although there is a growing interest by the researchers in the field of sustainable development and eco innovation, a number of shortcomings remain as main streams of literature enriched under macro and meso level relative to micro level perspective (Dangelico & Pujari, 2010; Schiederig et al., 2012). More specifically, most of researchers provide a rudimentary indication of environmental reduction activities from the regulatory factors from institutional theory and stake holder theory (Zailani et al. 2012). However, sustainable development per se is critically dependent on the firm’s voluntary efforts to ensure the success of green activities implementation. Resource base view and dynamic capabilities have taken a considerable amount off the Holy Grail of sustainable development as well as eco product innovation.

According to Thirichelvam et al. (2013), automotive industries are approved as the heart to bridge nation’s development through high rate of employment and are attracted many direct investment by the global automakers. The Challenges for the Malaysian Automotive industries relies on shifting of the global competitive strategy from efficient and superior product to the green product. Since the Malaysian auto industry is not capable to compete in the efficiency and attractive price as compared to other carmakers, the introduction of eco product innovation promises a new solution as one of mechanism for sustainability. In the wake of these attention and a dearth of related literature from the developing countries, this paper provide a fertile ground of the predictors for sustainable development in a South east Asian country from the Resource base view and dynamic capabilities theory.

2 Theoretical Background and hypotheses development

Eco innovation is recognized as a state of the art for the sustainable development and able to stimulate growth underline in triple bottom; economy, ecology and social. There are many drivers as such external and internal captured under the umbrella of eco innovation efforts proposed by many authors (González et al. 2008)(Zailani et al. 2012). The common drivers rest on strict regulation, economic return, competitive advantage and opportunity awareness. In the another hand, some scholars believed that green commitment rest on the company’s initiatives and capabilities as pointed out by (Dangelico & Pujari 2010). The researchers conducted by Zailani et al. (2012) and Sroufe (2003) confirmed that eco product innovations practices mediated the relationship between external drivers as such customer pressure, government regulation and environmental performance outcomes, meanwhile the internal driver as such environmental management system (EMS) and operational performance respectively. Furthermore, having eco innovation in terms of organizational, product and process mediates the relationship between innovation strategy and firm performance (Cheng & Shiu 2012).

Scholars embraced Environmental Management system Strategy as valuable, rare, Imitable and non-substitute resource that play a crucial role on supporting firm’s green initiatives. Furthermore, as proposed by several scholars (Ramus 2002)(Daily & Huang 2001)(Govindarajulu & Daily 2004), to ensure the effective employee’s eco initiatives, the adoption of simultaneous practices as such Environmental Management System is vital for any firms. Technology capabilities acknowledge as part and parcel to drive innovation activities, thus firm with higher technology know how in turn enable firms to stimulate economic growth (S.A et al. 2012) . As reported by Arnold & Thuriaux (1997), strategic capabilities, internal capabilities and external capabilities considered as the heart of technology capabilities for competitive edge. Despite of technology collaboration, human resource acknowledge as a backbone to describe firm dynamic capabilities (Leonard-barton 1992)(Eisenhardt & Martin 2000) and sustainable advantage (Cooke 2007). The important of human resources in supporting strategic innovation (Chen & Huang

2009) and organizational innovation(Ling 2010) vastly explored in literature while little systematic research and empirical study on green human resource management (Jackson et al. 2011) specially in the Asian based countries (Renwick et al. 2013). There is a rich stream of literature which is discussing the relationships of eco innovation culture, green human resource and employees green improvement as initiate by (Daily & Huang 2001)(Govindarajulu & Daily 2004), but this dimensions lack of empirical evidence (Fernandez et al. 2003) to describe managerial cultural factors (Pujari 2006)(Linnenluecke & Griffiths 2010) to support Firm’s eco innovation efforts and performance.

Thus, the development conceptual framework and hypothesis testing draw as figure 1 below:

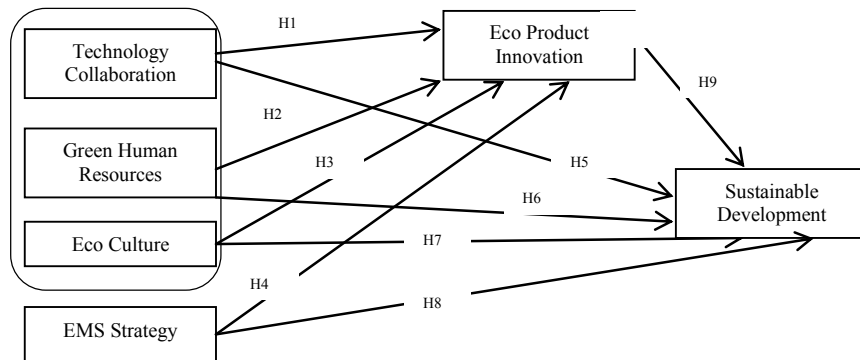


Figure 1: The research Model

3.0 Methodology

3.1 Sample and data collection

This research employed structured questionnaire on gathering data from firm’s between the Malaysian automotive industries. The multi stage cluster sampling, the criteria of selected cluster. Three regions such as northern region, central region, Southern Region were selected and comprised of seven sub-sectors derives from MAI, Proton and Perodua database. The questionnaire was aimed to be filled up by the managerial level as such CEOs, manager, senior executive or business owner because of their similarities in the characteristics and perceived information regarding organization activities towards eco product innovation efforts and the performance. Furthermore, four departments have been identified that has direct exposure towards organization eco product innovation as such R&D, Quality, operation and EHS. A set of 450 questionnaires were distributed to the automotive manufacturer and sub sector resulted to 320 questionnaires returnable and ready to be analysed.

3.2 Operationalization of constructs

Table 1 shows the full set of measurement used in this research. A 7 point Likert scale was designed ranging from (7) high existence (1) Low existence to portrayed eco product innovation, from (7) high implement (1) Low implement to describe firm’s resource and capabilities and (7) Strongly agree (1) Strongly disagree to measure sustainable development.

Table 1: Summary of measurement items

| Construct | No of Items | Source |
|--------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------|
| Technology Collaboration | 8 | (Hofmann et al., 2012). (J Conding & Fadly Habidin, 2013), (Zhu et al., 2008),(Eltayeb & Zailani, 2009), (Pujari, 2006), |
| Green Human Resource | 9 | Daily et al., 2012), (Theyel, 2000, (Digalwar et al., 2013), Shatouri et |

| | | |
|-------------------------|----|---------------------------------------------------------------------------------------------------------------------|
| Eco Culture | 8 | al., 2013), (C. A. Ramus, 2001), (C. Ramus & Steger, 2000) (C. A. Ramus, 2001), (Shatouri et al. 2013) |
| EMS strategy | 8 | (Wu et al., 2008), (Sroufe, 2003), (Digalwar et al., 2013) |
| Eco Product Innovation | 16 | (Cheng & Shiu 2012) (Dangelico & Pujari 2010) |
| Sustainable development | 9 | (Zailani et al. 2012), (Jabbour et al. 2012)(E.Amrina & Yusof 2011), (Daily et al. 2012), (Shatouri et al. 2013) |

4. Data Analysis

4.1 Descriptive analysis

There was a total of 320 respondents comprised of SME and large corporations are recorded by N=133(41.6%) and N= 187 (58.4%) from the central region (80%) as compared to the northern and southern area by 10% and 10% respectively. Higher frequency of respondent reported from metal part industry (N=89) and others industry (N= 61), while others type of respondent consist engine/transmission part, plastic part, electronic part, rubber part and automaker distributed in the range of 7% to 12%. To increase reliability of this study, only middle management as such the senior executive and above from R&D (54person), Quality (71 person), Operation (80, EHS (3 person) and business development (112 person) was allowed to answer the questionnaire as these department have information about firm's eco product innovation efforts.

Due to the fact that common method variance (CMV) may occurred during the data collection procedure due to both measurement for criterion and predictor were generated from a single respondent of a company at the same time, Harman Single factor test was employed, following by the recommendation from (Podsakoff et al. 2003). The analysis showed that, there was no CMV occurred because its statistically proven 13 factors appear and no high correlations appear between the factors (Bagozzi et al. 1991). A comparison of two groups was conducted by using the Independent sample test and the results of T-Tests of group means revealed that, there were no significant differences on all variables. Because of all mean paired comparisons show insignificant differences at the .05 level (Armstrong & Overton 1977), nonresponse bias was not considered as a major problem in this study. To refine the proposed conceptual model, exploratory factor analysis (EFA) was performed following (Jöreskog 1993) recommendation because of no concrete number of dedicated factors. The preliminary construct of EMS strategy are fully adopted from Sroufe (2003) by measuring EMS strategy in one construct. However, the findings in line with (Wu et al. 2008) proposal on measuring EMS strategy in part and parcel in terms of formal EMS and top management support.

4.2 Measurement Model

In a nutshell, Measurement model evaluated via CFA test to estimate its quality and fit via uni-dimensionality (Sroufe 2003), construct validity as well as reliability test. For a good model fit measurement, uni-dimensionality determine by calculating the X^2 test (Hu & Bentler 1998) via conforming the p-value must be exceeds 0.05 to show significant difference between the sample variance/covariance matrix in order to accept the model proposed. Further, the GOF rules of thumbs need to be checked based from Hair, Black, et al. (2010) recommendation in maintaining its validity. According to them, crucial point on measuring the model fit relies on RMSE, TFI, CFI and X^2 . The values of Root Mean Square error (RMSE) should not exceed 0.08 with Comparative Fit Index values should exceed 0.97 or higher, while insignificant p-values expected. The analysis show that the model fit the data well, as the value of crucial indicators as such CFI= 0.955, TLI=0.950 and RMSEA =0.055 is below than the golden rule. Even thought that the chi-square was insignificant ($X^2= 808.205$, $df= 413$ $p=0.00$ $N=320$), The bootstrapping procedure, however were not undertaken because the p value is sensitive to the sample size > 200 (Hair, Anderson, et al. 2010) and the larger the sample size, the more likely the p-value associated with the χ^2 will result a significant difference between the model and the data (Kline 2005).

In another hand, reliability of the constructs evaluated using internal reliability, construct reliability and average variance extracted. Internal reliability achieved when the Cronbach’s Alpha values is higher than 0.7, Construct reliability (CR) more than 0.6 while Average variance extracted (AVE) higher than 0.5. As shown in table 2 below, the value of Cronbach's Coefficient Alpha for all of the construct meet the recommended value by (Nunnally 1978). In another coin, the AVE and CR values was acceptable based on formulas designed by (Fornell, C., & Larcker 1981).

Table 2: Reliability Analysis

| Constructs | Cronbah’s alpha | Composite reliability | Average variance extracted (AVE) |
|--------------------------|-----------------|-----------------------|----------------------------------|
| Technology Collaboration | 0.88 | 0.87 | 0.59 |
| Green Human Resource | 0.90 | 0.90 | 0.70 |
| Eco culture | 0.91 | 0.92 | 0.74 |
| EMS strategy | 0.90 | 0.98 | 0.93 |
| Eco Product Innovation | 0.87 | 0.88 | 0.56 |
| Sustainable development | 0.92 | 0.91 | 0.68 |

4.3 Structural Analysis

An examination of GOF indices indicated that the hypothesized model fit the data adequately with all fit indices showed reasonable values ($X^2=713.325$, $df=384$, $p=0.00$). In addition, the $GFI=0.869$ $AGFI=0.849$ $CFI= 0.961$ $TLI=0.95$ and $RMSEA=0.05$ in an acceptance range for the fit indices. Six out of nine path were significant with p values $< .001$, $**p < .01$, $*p < .05$ with R^2 values ranging from 0.15 and 0.28 respectively. The values indicated that the variances explained range from 15% for eco product innovation and 28% for sustainable development. In attempt to accept or reject the proposed hypothesis, twofold parameter will be utilised namely parameter estimate β and critical value for regression weight (CR). In this respect, it has been proven that three hypothesis need to be rejected because of both CR and p -values found not significant as in table 3.

Table 3: Result of hypothesis testing

| Predictor variable | Criterion variable | Estimated | S.E. | C.R. | P | Results |
|-------------------------|-------------------------------|-----------|-------|--------------|---------|----------------------|
| Eco Product Innovation | (H1) Technology collaboration | 0.204 | 0.067 | 3.05 | 0.002** | Supported |
| Eco Product Innovation | (H3) Eco culture | 0.013 | 0.059 | 0.22 | 0.82 | Not Supported |
| Eco Product Innovation | (H2) GHR | 0.204 | 0.07 | 2.93 | 0.003** | Supported |
| Eco Product Innovation | (H4a) Formal EMS | 0.058 | 0.032 | 1.79 | 0.073* | Supported |
| Eco Product Innovation | (H4b) Top management Support | 0.037 | 0.072 | 0.51 | 0.606 | Not supported |
| Sustainable development | (H9) Eco Product Innovation | 0.075 | 0.042 | 1.78 | 0.074* | Supported |
| Sustainable development | (H7) Eco culture | 0.07 | 0.041 | 1.71 | 0.086* | Supported |
| Sustainable development | (H6) GHR | 0.144 | 0.049 | 2.94 | 0.003** | Supported |
| Sustainable development | (H8a) Formal EMS | -0.03 | 0.022 | -1.34 | 0.18 | Not Supported |
| Sustainable development | (H8b) Top management support | 0.173 | 0.051 | 3.37 | *** | Supported |
| Sustainable development | (H5) Technology Collaboration | 0.128 | 0.047 | 2.72 | 0.006** | Supported |

Notes: *** p -value < 0.01 ; ** p -value < 0.05 ; * p -value < 0.10 (one tailed test)

4.4 Mediating Analysis

There is a rich stream of literatures which is discussing the empirical test on measuring mediation effects. Under the broad umbrella of mediation test, the initial test called causal steps analysis was introduced by Baron & Kenny (1986), Sobel test (Sobel 1982)(Sobel 1986) and in the new millennium, bootstrap method by Preacher & Hayes

(2004)perceived widely attention(Hayes 2009). In general, the result of bootstrap gained in accurate probability as this results help the mediation problems in which the mediator and outcomes variables are not normally distributed (Shrout & Bolger 2002) (Hayes 2013), provides a general way to test significant and confidence intervals in a wide variety of situation as well as this test not dealing with complex assumptions (Hayes 2009)(MacKinnon et al. 2002). Reaping with benefits provided, this research adopted bootstrapping techniques in measuring Eco Product Innovation as the mediator between technology collaboration, green human resource, eco culture, formal EMS and top management support with sustainable development. To test the significant level of each mediating effects in the aforementioned proposal, the bootstrapping method though maximum likelihood (ML) with 1000 bootstrap re-sampling and 95% bias corrected confidence intervals was utilised as suggested by (Cheung & Lau 2008)(Preacher & Hayes 2008)(MacKinnon et al. 2002).

In order to stimulate conclusion for mediating effects of each of the hypothesized path, the total effect, indirect effect and direct effect were measured following bootstrap method by (Preacher & Hayes 2004). The total effect defined as the degree to which a change in the predictor variable is related to criterion variable. In one hand, indirect effect described the degree to which a change in the predictor variable produces a change in the criterion variable through the mediator variable; meanwhile direct effect is the degree to which a change in the predictor variable is directly related with the criterion variable without going through the mediator variable. Armed with the previous description, this research employed recommendation made by (Mathieu & Taylor 2006). If an indirect effect is not significant ($p>0.05$), so no mediation effects appear. If both the indirect effects ($p<0.05$) and direct effects ($p<0.05$) are significant, this is a perfect indicator for the partial mediation. However, if the indirect effect ($p<0.05$) are significant but the direct effect ($p>0.05$) is not significant, this reveals the full mediation. Details of degree of mediation described as in table 4.

Table 4: Degree of mediation effects

| Predictor→Mediator→Criterion | Direct Effect | Indirect Effect | Total Effect | Degree of Mediation |
|------------------------------|---------------|-----------------|--------------|---------------------|
| Tech Collaborate →EPI→SD | 0.013** | 0.043** | 0.006*** | Partial |
| Green Human →EPI→SD | 0.003*** | 0.04** | 0.002*** | Partial |
| Eco Culture →EPI→SD | 0.101 | 0.631 | 0.102 | No mediation |
| Formal EMS →EPI→SD | 0.126 | 0.048* | 0.205 | Full mediation |
| Top management→EPI→SD | 0.002 | 0.76 | 0.002 | No mediation |

Notes: *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.10 (two tailed test)
EPI=Eco Product innovation; SD=Sustainable development

5. Discussion and Conclusion

This study increased the existing knowledge on the areas of environmental management in developing country. It also examined the predictors of sustainable development as well as eco product innovation from new perspective of firm's resource and capabilities. The results strongly suggest that all five construct namely technology collaboration, green human resource, eco culture, top management support and eco product innovation positively related to sustainable development. Meanwhile, one construct under formal EMS have indirect effect en route to sustainable development, while eco product innovation show as a good mediator between firm's resource and capabilities with triple helix performance. Furthermore, technology collaboration, green human resource and formal EMS recognized a good predictor for eco product innovation.

The findings in this study are consistent with the previous literature by (Hofmann et al. 2012) which emphasized technology collaboration between both supplier and customer positively increased the environmental innovation activities. Having an upstream and downstream integration providing a positive substantial impact in automotive industry especially for developed and developing countries. This study also support previous findings that suggest employee training and green team (Daily et al. 2012)(Jabbour et al. 2012)(Theyel 2000) as the heart of firm's capabilities to achieved Eco Product innovation. In particular, training is necessary to be provided in firms to

increased employees knowledge, however, to ensure knowledge, skills and capabilities sustain through time, employees must be given an opportunities to implement the environmental knowledge as agreed by (Daily et al. 2012).

Apparently, environmental management prerequisite a special treatment and handling, thus, formal EMS play a pivotal role (Theyel 2000) on guiding the employee to do right things in the first place. Employee must be supported by a formal document on how to handle hazardous chemicals, storage requirement and correct disposal. Thus, these tasks it's difficult to be understood without any visual guidelines or proper procedure to display the correct method. The aforementioned argument is aligned with human behaviour which is to attain correct actions, where one's must provide with formal rules and specific guidance (Sroufe 2003). Further, having formal and documented procedure of ISO 14000 EMS with details plan of indicating firm commitment to environmental compliance as well as selecting a relevance environmental practice is crucial (Ferrante & Cotter 1999) so that employees having a clear mind set of company direction towards reducing carbon foot print. The findings also align with (Ramus 2002) reports as *"the written environmental policy often act as a guide for employee actions when its provides environmental target and objectives"* as well as direct effect towards environmental practices in terms of environmental design, recycling and waste as enlighten by (Sroufe 2003). In a nutshell, having a physical resource in term of formal EMS was much more proactive rather than top management support on ensuring success implementation of Eco Product innovation as this resource is relies on the physical manuscripts and provided an efficient way of implementation as well as consistent guidance to be followed.

Although many researchers pointed out the important of organization culture to support environmental innovation, but the bold of reality is, Malaysian automotive industry didn't relies on the organization culture as a medium to fertilized eco innovation efforts. In line with this argument, (Eltayeb & Zailani 2009) supported that green initiative between Malaysia firms highly supported by the types of ownership as Japanese and European based country recognized environmental protection as a mantra in new business settings as compared to Malaysia fully owned organization. Contrary to Malaysian owned organization, both Japanese and European based county embrace green initiatives through green purchasing as practices by Germany firms (Carter & Carter 1998) and top management support for continuous improvement in Japanese organization (Nonaka 1991) respectively. In line with previous argument, environmental innovation is prone to cultural transformation and required a proactive action from both top management support and employee involvement and it's a strong reason why Malaysia owned organization still lag behinds in environmental activities. Perhaps, in another coin, eco culture didn't have a direct relationship with eco innovation efforts specially in Malaysia automotive industry, but have indirect effect (Hair, Black, et al. 2010) towards eco innovation efforts, as traced in (Škerlavaj et al. 2010) which indicated that organization cultures mediate the relationship between organization learning and innovativeness. In a similar vein, (Shatouri et al. 2013) provided the conceptual framework by indicating organization culture as a mediator between green human resource with green technology innovativeness

In this respect, it has been proved that both technical collaboration in terms of green ideas, information as well as knowledge sharing between both customer and supplier positively benefits on Eco Product innovation as well as triple helix performance. In the same fashion, successful green human resource management in term of training and green team's formation also provided two folds reimbursements. However, for the formal EMS, the results little bit difference because of the indirect effects appears. As in hypothesis 9, Formal EMS indicated no direct effect that draw a conclusion of no positive relationship with sustainable development. However, as per proposed by (Baron & Kenny 1986), the *"mediating effect is created when a third variable/constructs intervenes between two other related constructs"*. In this case, indirect effect occurred because of the relationship involved as a sequence with at least one intervening construct involved. This argument also align with (Ramus 2002) argument *"having a written policy in itself does not make a company proactive or sustainable. Rather it is a necessary perquisite for sustainable development"*.

6. Research contribution

This study was very fruitful in clarifying our understanding the predictors of sustainable development at micro level perspectives on describing firm's green resource and capabilities. Further, the cutting edge of this research rest

on shed new knowledge under eco innovation research by providing theory driven empirical evidence that connecting eco product innovation with triple helix performance in terms of economy, ecology and social development. In the same fashion, this research contribute to the body of knowledge as the proposed framework echo the study by (Cheng & Shiu 2012) (Dangelico & Pujari 2010) in describing the relationship between eco product innovation and sustainable development. Further, this research giving a substantial impact on the actual practice of Malaysia automotive industry since scholars and managers are extremely keen to learn about the firm's voluntary efforts towards reducing carbon footprint.

For the managerial implications, this study provides managers a useful tool on designing the environmental activities based on their own resources and capabilities. It's crucial for firms to engage with both customers and suppliers in drawing any environmental product design, environmental initiatives as well as increase the commitment on green efforts. Instead of that, top management should cultivate eco culture and embraced internal resource to encourage green initiatives. Having an open discussion with employees about green efforts, encouraged green training as well as green team formation in turn stimulate growth of environmental ideas, skills and capabilities between their employees. Furthermore, company EMS policy if being implemented accordingly, will benefits to firms in long run. Thus, it's very important the top management to draw a specific environmental statement to represent company commitment towards environmental efforts, consistently measuring the organizations environmental planning during top management meeting and allocated person in charge for tracking and monitoring environmental information.

7. Limitation and suggestion for future research

Two specific limitations surround this research. Firstly, this research prone to common method variance because of the single source data collection procedure and the findings could not be generalize to all eco product innovation since the attributes of eco product in this research technically suitable with incremental product. Since this research employed both voluntary efforts, future research could draw from institutional theory to develop an integrated theoretical framework that specifies the nature of the interaction effect between the institutional and task environments on corporate environmental responsiveness. One idea in particular that should be examined is the extent to which the institutional environment buffers task environmental pressures on corporate environmental responsiveness as well as measuring Eco innovation impact towards sustainable performance specifically on radical eco innovation.

Acknowledgement

The main author is a PhD student currently sponsored under the SLAI scheme under Ministry of higher Education, Malaysia. The authors would like to acknowledge the support given from Universiti Teknikal Malaysia Melaka (UTeM) for supporting her research endeavour.

References

- Arnold, E. & Thuriaux, B., 1997. *Developing Firms Technological Capabilities*, Technopolis Group Report
- Baron, R.M. & Kenny, D. A., 1986. The Moderator-Mediator Variable Distinction In Social Psychological Research: Conceptual, Strategic, And Statistical Considerations. *Journal Of Personality And Social Psychology*, 51(6), Pp.1173–1182.
- Carter, C.R. & Carter, J.R., 1998. Interorganizational Determinants Of Environmental Purchasing: Initial Evidence From The Consumer Products Industries. *Decision Sciences*, 29(3), Pp.659–684.
- Chen, C.-J. & Huang, J.-W., 2009. Strategic Human Resource Practices And Innovation Performance — The Mediating Role Of Knowledge Management Capacity. *Journal Of Business Research*, 62(1), Pp.104–114.
- Cheng, C.C. & Shiu, E.C., 2012. Validation Of A Proposed Instrument For Measuring Eco-Innovation: An Implementation Perspective. *Technovation*, 32(6), Pp.329–344.
- Cheung, G.W. & Lau, R.S., 2008. Testing Mediation And Suppression Effects Of Latent Variables: Bootstrapping With Structural Equation Models. *Organizational Research Methods*, 11(2 .), Pp.296–325.
- Cooke, W.N., 2007. Integrating Human Resource And Technological Capabilities: The Influence Of Global Business Strategies On Workplace Strategy Choices. *Industrial Relations*, 46(2), Pp.241–270.
- Daily, B.F., Bishop, J.W. & Massoud, J. A., 2012. The Role Of Training And Empowerment In Environmental Performance: A Study Of The Mexican Maquiladora Industry. *International Journal Of Operations & Production Management*, 32(5), Pp.631–647.

- Daily & Huang, 2001. Achieving Sustainability Through Attention To Human Resource Factors In Environmental Management. *Sustainability Through Human Resource Factors*, 21(12), Pp.1539–1552.
- Dangelico, R.M. & Pujari, D., 2010. Mainstreaming Green Product Innovation: Why And How Companies Integrate Environmental Sustainability. *Journal Of Business Ethics*, 95(3), Pp.471–486.
- E.Amrina & Yusof, S.M., 2011. Key Performance Indicators For Sustainable Manufacturing Evaluation In Automotive Companies. In *Proceedings Of The 2011 Ieee*. Pp. 1093–1097.
- Eisenhardt, K.M. & Martin, J. A., 2000. Dynamic Capabilities: What Are They? *Strategic Management Journal*, 21(10-11), Pp.1105–1121.
- Eltayeb, T.K. & Zailani, S., 2009. Going Green Through Green Supply Chain Initiatives Towards Environmental Sustainability. *Operations And Supply Chain Management*, 2(2), Pp.93–110.
- Fernandez, E., Junquera, B. & Ordiz, M., 2003. Organizational Culture And Human Resources In The Environmental Issue : A Review Of The Literature. *International Journal Of Human Resource Management*, 14(4), Pp.634–657.
- Ferrante, J.G. & Cotter, J., 1999. The Iso 14001 Environmental Management System: A Prescription For Environmental And Financial Health. *Environmental Quality Management*, 9, Pp.63–74.
- Fornell, C., & Larcker, D.F., 1981. Evaluating Structural Equation Models With Unobservable Variables And Measurement Error. *Journal Of Marketing Research*, Pp.39–50.
- González, P., Sarkis, J. & Adenso-Díaz, B., 2008. Environmental Management System Certification And Its Influence On Corporate Practices: Evidence From The Automotive Industry. *International Journal Of Operations & Production Management*, 28(11), Pp.1021–1041.
- Govindarajulu, N. & Daily, B.F., 2004. Motivating Employees For Environmental Improvement. *Industrial Management & Data Systems*, 104(4), Pp.364–372.
- Hair, Anderson, Et Al., 2010. *Multivariate Data Analysis* Eleventh E., Pearson Prentice Hall.
- Hair, Black, W.C., Et Al., 2010. *Multivariate Data Analysis :Global Perspective*,
- Hayes, A.F., 2009. Beyond Baron And Kenny: Statistical Mediation Analysis In The New Millennium. *Communication Monographs*, 76(December 2012), Pp.408–420.
- Hayes, A.F., 2013. *Introduction To Mediation, Moderation And Conditional Process Analysis: A Regression Based Approach*, Guilford Press.
- Hofmann, K.H., Theyel, G. & Wood, C.H., 2012. Identifying Firm Capabilities As Drivers Of Environmental Management And Sustainability Practices - Evidence From Small And Medium-Sized Manufacturers. *Business Strategy And The Environment*, 21(8), Pp.530–545.
- Hu, L. & Bentler, P.M., 1998. Fit Indices In Covariance Structure Modeling: Sensitivity To Underparameterized Model Misspecification. *Psychological Methods*, 3(4), Pp.424–453.
- Jabbour, C. Et Al., 2012. Environmental Development In Brazilian Companies: The Role Of Human Resource Management. *Environmental Development*, 3, Pp.137–147.
- Jackson, S.E., Renwick, Douglas W. S.; Jabbour, C.J.C. & Müller-Camen, M., 2011. State-Of-The-Art And Future Directions For Green Human Resource Management: Introduction To The Special Issue. *Zeitschrift Für Personalforschung (Zfp)*, Issn 1862-0000, Rainer Hampp Verlag, Mering., 25(2), Pp.99–116.
- Kline, R., 2005. *Principles And Practice Of Structural Equation Modelling* 2nd Edn., New York: Guilford Press.
- Leonard-Barton, D., 1992. Core Capabilities And Core Rigidities : A Paradox In Managing New Product Dev. *Strategic Management Journal*, 13(Special Issue), Pp.111–125.
- Ling, T.C., 2010. Human Resource Management Practices And Organizational Innovation: An Empirical Study In Malaysia. *The Journal Of Applied Business Research*, 26(4), Pp.105–116.
- Linnenluecke, M.K. & Griffiths, A., 2010. Corporate Sustainability And Organizational Culture. *Journal Of World Business*, 45(4), Pp.357–366.
- Mackinnon, D.P. Et Al., 2002. A Comparison Of Methods To Test Mediation And Other Intervening Variable Effects. *Psychological Methods*, 7(1), Pp.83–104.
- Mathieu, J.E. & Taylor, S.R., 2006. Clarifying Conditions And Decision Points For Mediational Type Inferences In Organizational Behavior. *Journal Of Organizational Behavior*, 27(April), Pp.1031–1056.
- Nonaka, I., 1991. The Knowledge-Creating Company. *Harvard Business Review*, July-August(2007), Pp.162–171.
- Nunnally, J., 1978. *Psychometric Methods*, New York: Mcgraw.
- Preacher, K.J. & Hayes, A., 2008. Supplemental Material To Accompany Preacher And Hayes.
- Preacher, K.J. & Hayes, A.F., 2004. Spss And Sas Procedures For Estimating Indirect Effects In Simple Mediation Models. *Behavior Research Methods, Instruments, & Computers : A Journal Of The Psychological Society, Inc*, 36(4), Pp.717–731.
- Pujari, D., 2006. Eco-Innovation And New Product Development: Understanding The Influences On Market Performance. *Technovation*, 26(1), Pp.76–85.
- Ramus, C. A., 2002. Encouraging Innovative Environmental Actions: What Companies And Managers Must Do. *Journal Of World Business*, 37(2), Pp.151–164.
- Renwick, D.W.S., Redman, T. & Maguire, S., 2013. Green Human Resource Management: A Review And Research Agenda. *International Journal Of Management Reviews*, 15(1), Pp.1–14.
- S.A, A. Et Al., 2012. Inter-Firm Knowledge Transfer To The Capability Of Local Parts Firms In The Malaysian Automobile Industry. *European Journal Of Business And Management*, 4(18), Pp.156–163.
- Shatouri, R.M. Et Al., 2013. Embracing Green Technology Innovation Through Strategic Human Resource Management : A Case Of An Automotive Company. *American Journal Of Economics And Business Administration*, 5(2), Pp.65–73.
- Shrout, P. & Bolger, N., 2002. Mediation In Experimental And Nonexperimental Studies: New Procedures And Recommendations. *Journal Of Sport & Exercise Psychology*, 7(4), Pp.442–445.
- Škerlavaj, M., Song, J.H. & Lee, Y., 2010. Organizational Learning Culture, Innovative Culture And Innovations In South Korean Firms. *Expert Systems With Applications*, 37(9), Pp.6390–6403.
- Sobel, E., 1986. Some New Results On Indirect Effects And Their Standard Errors In Covariance Structure. *Sociological Methodology*, 16(1986), Pp.159–186.

- Sobel, M.E., 1982. Asymptotic Confidence Intervals For Indirect Effects In Structural Equation Models. *Sociological Methodology*, 13(1982), Pp.290–312.
- Sroufe, R., 2003. Effects Of Environmental Management Systems On Environmental Management Practices And Operations. *Production And Operations Management*, 12(3), Pp.416–431.
- Theyel, G., 2000. Management Practices For Environmental Innovation And Performance. *International Journal Of Operations And Production Management*, 20(2), Pp.249–266.
- Zailani, S.H.M. Et Al., 2012. The Impact Of External Institutional Drivers And Internal Strategy On Environmental Performance. *International Journal Of Operations & Production Management*, 32(6), Pp.721–745.