GREEN INNOVATION IN SMES: THE IMPACT OF GREEN PRODUCT AND PROCESS INNOVATION ON ACHIEVING SUSTAINABLE COMPETITIVE ADVANTAGE AND IMPROVED BUSINESS PERFORMANCE

Eugine Tafadzwa Maziriri, University of the Free State
Tafadzwa Clementine Maramura, University of the Free State

ABSTRACT

This paper aims to assess the impact green product innovation and green process innovation on sustainable competitive advantage and business performance of SMEs in the manufacturing sector of South Africa. For this study, a quantitative approach was employed. The analysis was carried out in SPSS 25 for demographic data analysis and AMOS 25 was used for the modelling and modelling of the structural equation. The tested relationships produced satisfying results in line with how they were hypothesized. Precisely, according to the results of the structural equation modelling analysis. It was established t that sustainable competitive advantage and business performance were positively affected by green product innovation and green process innovation. The empirical study provided useful implications to academicians by making a significant contribution to the small business management literature. The results of this study have important practical consequences for global leaders and managers considering Green Product Innovation. The implications of the academic research results conclude t that green innovation offers competitive advantage and increased strategic business value in a competitive industry within to a changing dynamic marketing environment.

Keywords: Green Product Innovation, Green Process Innovation, Sustainable Competitive Advantage, Business Performance.

JEL Classification: M0.

INTRODUCTION

Small and medium-sized enterprises (SMEs) have become a significant topic for government leaders, policy makers and leaders around the world. This topic has led to a rise in academic research interest, focused on small and medium-sized enterprises (Mafini & Omuruyi 2013). As at 2016, the total number of South-African SMEs totalled 2 million (Van-Scheers & Makhitha (2016). SMEs contribute between 52% and 57% to South-Africa's GDP and account for around 61% of the South African population. An academic report confirmed that 91% per cent of formal organizations are South African SMEs, Maziriri and Mapuranga (2017), refers to the fact that SMEs make a significant contribution to the national GDP and the private sector. Love and Roper (2015) states that SMEs are the main sources of the age and yield growth of both development and developed countries as they assume an essential role in monetary progress. SMEs are the quickest developing portion of economies and are validated to be progressively adaptable and versatile when compared to larger sized bigger organisations (Kumar, 2012). Terziovski (2010) argues that SMEs in the assembling division

Citation Information: Maziriri, E.T., & Maramura, T. (2022). Green innovation in SMEs: the impact of green product and process innovation on achieving sustainable competitive advantage and improved business performance. *Academy of Entrepreneurship Journal, 28*(1), 1-14.

make a significant commitment to monetary development. The According to The Small Enterprise Development Agency (SEDA) (2012), SMEs are key drivers to creating jobs in every industry, specifically in the manufacturing industry. The Gauteng provincial government envisages helping the growth and development of SMEs in the manufacturing industry by creating organizations with effective SME innovations through offices (legislative and non-governmental) (Small Enterprise Development Agency, 2012).

Ebitu et al. (2015) state that SMEs locally and globally are technically focussed and require powerful promotion to achieve an aggressive edge over their competitors. Carneiro et al. (2013) advocate that companies in the manufacturing sector, in particular SME's, should collaborate there to share their combined skills develop innovations off high quality and range to achieve their strategic goals. Similarly, it is vital for manufacturing SME leader to design green product innovations and factor in green process innovation in order to achieve increased competitive advantage (Osuga, 2016). Contrary to this Kimani (2015) states that green marketing practises as a rule, impact execution and that connection to singular proportions of execution, green marketing practises have a critical impact on ingenuity and viability Arenhardt et al. (2016).

Research Context: SMEs and Sustainable Development

Sustainable development has a number of key features. The key features for sustainable development include monetary, social, institutional, biological, social, instructive and political features. This indicates that all feature needs to be factored into the financial record keeping for advancement and environmental improvement (Cant & Wiid, 2013). Argues that sustainable development is a pivotal strategic organizational planning, as it significantly increases business model operations which is of benefit of all stakeholders. Proposes that human culture ought not to exist at the cost of the environment's limits. Therefore, the higher purpose principles of human development will lower the biological imprint. It is unfortunate how in a majority of developing countries, the ecological imprint is and yet human development progress remains low. Poverty remains a future challenge to sustainable development, environmental security, global stability and financial improvement. By understanding sustainable competitive advantage and the execution of business, there is a need to forge sustainability equilibria. Sustainable equibria can be achieved by linking financial and environmental factors. Since the 1990s, the concept of sustainable development and its multidisciplinary nature has resulted to be broad in the business community in enabling sustainable development for all key stakeholders (Chakraborty & Roy, 2016).

Problem Statement and Research Gap

Regardless of the imperative for SMEs, numerous policy activities proposed by governments in the developing economies in supporting SME growth and development has been a failure (Njoroge, 2015). Ebitu et al. (2015) advocate the view that private companies face numerous issues. In South Africa advocates that SMEs in the manufacturing sector are challenges with competitors of large sized organisations. Omar & Anas (2014) state that the range of challenges among SMEs against their larger competitors, will encounter difficult issues relating to sustainable development, experienced by SMEs. Similarly, Cant and Wiid (2013) state that sustainable development challenge is a key factor negatively impacting SMEs., Mthabela (2015) highlights that endeavours made by the South African government to help with building up the SME sector, specifically manufacturing SMEs based in Johannesburg are neglected from becoming sustainable and successful equitable organizations. This academic paper seeks to discover the root cause and hypothesis needed to

Citation Information: Maziriri, E.T., & Maramura, T. (2022). Green innovation in SMEs: the impact of green product and process innovation on achieving sustainable competitive advantage and improved business performance. *Academy of Entrepreneurship Journal, 28*(1), 1-14.

advance the expansion of SMEs with significant outcomes. By considering the key issues facing the sustainable development of SME's and considering the effect of green product innovation and green process innovation on increasing competitive advantage for SMEs in the manufacturing sector of South Africa.

EMPIRICAL LITERATURE

The following topics outline the academic literature review, which will be used to explore and investigate factors of green innovation, green product innovation, green innovation processes towards sustainable competitive and improved business performance (Hamann et al., 2017).

Green Innovation

Dangelico and Pontrandolfo (2010) advocate that the significant impact green innovations have on the global landscape at different stages in their life-cycle is of significant importance. The multifactorial procedure in which three key environmental epicentre nexus includes – materials, energys, and contamination. For SMEs, green innovation consideration incorporates the improvement of new, more earth benevolent elements and changing procedures for generation strategies (Brindley & Oxborrow, 2014). Green innovations can be organized into green product innovation and green process innovation (Chan, 2011; Rennings & Rammer 2009). Research completed by Kurapatskie & Darnall (2013) established that organizations that develop novel green products through innovations, generate more value than organizations that simply incrementally improve existing products and processes. The following topics of the academic literature review focus on a range of illustrations and considerations of green product innovation as well as green process innovation (Kong et al., 2014).

Green Product Innovation

According to Shapfi (2015) green product innovation is a multi-faceted domain blending environmental materials, energy, and contamination Küçükoğlu and Pınar (2015). These blended features depend on the impact on planet Earth at various phases of the product innovation life cycle. This includes the fabricating process, product application, and its disposal". Green product innovation includes three main components i.e. (i) the organization must select materials that produce minimal impact of contamination, (ii) the organization must utilize the minimal measure of materials to product items, and lastly (iii)the organization needs to vigilant in determining if the item can be repurposed for responsibly disintegrated (Guoyou et al., 2013). Improving green product innovation becomes is an imperative for alleviating the range of the negative impacts on the environment while working on improving their competitive advantage (Dangelico & Pontrandolfo, 2010); (Dangelico & Vocalelli, 2017). In summary, green product innovation is fundamental to increasing the profitability and sustainability of a SMEs by m while maintaining or growing its competitive advantage opportunities the industry. (Shapfi, 2015).

Green Process Innovation

Green process innovation is defined as changes in the current working processes and frameworks, with the aim of generating new or improved green products to reduce negative environmental effects (Meeus & Edquist, 2006). Xie et al. (2016), advocate that green process innovation involves improving existing forms of production or expanding new

Citation Information: Maziriri, E.T., & Maramura, T. (2022). Green innovation in SMEs: the impact of green product and process innovation on achieving sustainable competitive advantage and improved business performance. *Academy of Entrepreneurship Journal, 28*(1), 1-14.

methods to decrease its organic effects. "Green process innovation is characterized as the execution of process innovation that is identified with energy sparing, contamination prevention, waste reusing, or reduced harmfulness on people and the environment" (Nanath & Pillai 2017). Adovate that green innovations as an extraordinary innovation process that can maintain a competitive strategic position from the ecology (Shafi, 2016).

Sustainable Competitive Advantage

The sustainable competitive advantage of a business is the company's capacity to gain reliable benefits over opponent firms in the business by generating a domain which can't be matched effectively (Arseculeratne & Yazdanifard, 2013). Achieving sustainable advantage in terms of marketing is one of the objectives, on which companies are focusing, to change psychological and social awareness of the over-all public (Shakeel & Khan, 2011). According to Bulankulama et al. (2014) is defines that strategic organizational leadership capacity in which competitors find difficult to replicate. Lazenby (2018) states that sustainable competitive advantage means securing a novel innovation that competitors are unable to replicate. Similarly, Daft (2011) posits that that sustainable competitive advantage is what sets the organisation apart from its competitors affords it with a distinguishing value in the market place.

Business Performance

Davood & Morteza (2012) state thatbusiness performance is a firm's capacity to deliver profits sustainably. Similarly, Mark and Nwaiwu (2015) advocates that business performance is the capability of a business enterprise to meetits customers needs, employee satisfaction, corporate satisfaction and profitability goals. Business performance (BP) as a measure is both objective and subjective."Objective performance measures the economic factors, while subjective performance measures relate to non-tangible economic value" (Dubihlela, 2012); Matsuno and Mentzer (2000) definesbusiness performance as the as non-economic and economic performances (customer performance, customer retention, social approval, corporate identity and employee performance), Subjective business performance measurements were applied in this research study to determine the business performance of SMEs. This is due to the fact that a majority of SMEs are not willing to disclose their financial reports (Brownhilder, 2016). To addthe challenge to define objective performance data remains a concern for research aming SME's Van Scheers and Makhitha (2016).

Conceptual Model and Hypothesis Development

The empirical study, illustrated in Figure 1, will be used to guide the a conceptual model. The concept model delivers a green process and, product innovation asindicator variables. The mediating variable isthesustainable competitive advantage, withbusiness performance as fixed variable. The hypothesized relationships between the research variables are discussed below.

Citation Information: Maziriri, E.T., & Maramura, T. (2022). Green innovation in SMEs: the impact of green product and process innovation on achieving sustainable competitive advantage and improved business performance. *Academy of Entrepreneurship Journal, 28*(1), 1-14.

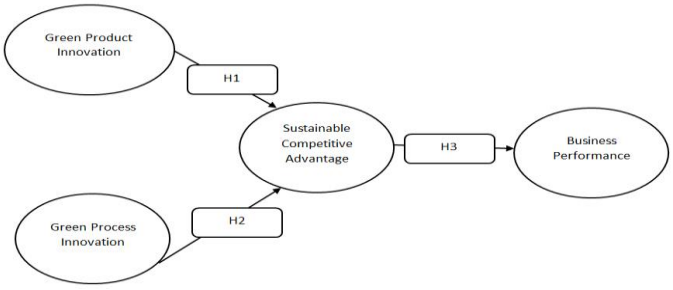

FIGURE 1
CONCEPTUAL MODEL

Green Product Innovation and Competitive Advantage

Green product innovation has a positive effect on competitive advantage. Chang (2011) established that green product innovation has a directlink to sustainable competitive advantage. States that organizations which focus on product innovation as a competitive advantage is likely to achieve a sustainable competitive advantage, while companies which use ecological consideration to distinguish their innovation products from competitors, to increase competitive capacities. A Guziana Study (2011) recommended ecological products as the foundation for corporate greening and identified three basic goals for organisations ie competitive advantage, green product innovaton and sustainable competitive advantage The synthesis derived from the academic literature review presents the following list of hypothesis the following.

H_1: *Green product innovation has a positive impact on sustainable competitive advantage*

H_2: *Green process innovation has a positive impact on sustainable competitive advantage*

Sustainable Competitive Advantage and Business Performance

Gaya et al. (2013) express that "the resource-based view joins superior commerce execution than the ownership and control of one of a kind centered resources that make a wellspring of feasible competitive advantage for organizations". Notwithstanding, Neto et al. (2015) take note that "to induce moved forward competitive advantage and remain in trade, a parcel of exercises are anticipated to consider openings, adjust and alter generation methods and items to clients' needs bringing almost a predominant business performance Willig (1994). In like manner, Amankwaa and Anku-Tsede (2015) highlight that organizations regarding workers as epicenter resources and profitable assets, and not as a cost, will in general tally on competitive advantage in their working industry. In this manner, sustainable competitive advantage can be acknowledged through the successful utilization of human capital which, on account of higher efficiency, may yield higher business performance. Further, assets that are significant, remarkable, exceptional and non-substitutable empower organizations to create and keep up competitive advantage and boost business execution (Horng & Huang, 2012). Similarly, a business getting a charge out of sustainable competitive advantage records a steady unrivaled business execution (Gaya et al., 2013). Finding from the talk and the empirical evidence, it could be set that:

H_3: *Sustainable competitive advantage has a positive impact on business performance*

Citation Information: Maziriri, E.T., & Maramura, T. (2022). Green innovation in SMEs: the impact of green product and process innovation on achieving sustainable competitive advantage and improved business performance. *Academy of Entrepreneurship Journal, 28*(1), 1-14.

RESEARCH METHODOLOGY

This research methodology pursues a constructivist paradigm. The research aims to discover the connection product innovation having a positive impact on sustainabele competitive advantage.

The quantitative research approach was used to deliver measurable results via a statistical analysis.

The target population for the research includes SME's small and medium working in the manufacturing industrys. The the target population included directors of SMEs situated in the Gauteng Region of South Africa during 2017. The sampling frame for the examination comprised of manufacturing SMEs working inside the Gautengregion The list of 1945 manufacturing SME's in the region of Gauteng was secured by The Small Enterprise Development Agency (SEDA), responsible for small enterprise development in South Africa. Research participants were emailed a qualitative rearch suvery. A random sample was hand selected from the sampling SEDA list. SsA random sample was applied using the sample measurement tool, using theRaosoft test calculator as part of this research study. The assessed population of 1945 was used, with a 5% margin of error Confidence intervals totalled 95% and a 50% response targted. The research sample size 50 % of the SEDA list was targetted with the sample grou[targetting 321 manufacturing SMEs.

Questionnaire Design and Measurement Instrument

The research instrument was a self-administered, structured questionnaire. On the premise of past work, the exploration scales were operationalised. The ebb and flow of research structures have been legitimately adjacent. A seven-item scale ' Green product innovation' was adapted from Cheng et al. (2014). In addition to this, a four-item scale was adapted from Kawai et al. (2016) to measure "green process innovation". Furthermore, "sustainable competition advantage" was based on adapted eleven-item scale, and "business performance" was assessed using adapted seventeen-item scale. Using a five point Likert scale, respondents were asked to demonstrate their agreement to the given questions, from 1=strongly disagree to 5=strongly agree.

Ethical consideration

Different ethical aspects including the right to privacy, secrecy, protection or non-participation, educated authorization, hurt security and victimization were tended to in the administration of the questionnaire. No incentives to participate in the survey were provided to the respondents

Data analysis

The gathered data from manufacturing SMEs were then recorded on an Excel spreadsheet after screening returned questionnaires. Then same data were analyzed using a software for descriptive statistics, Cronbach alpha values and correlations, the Statistical Package for Social Sciences (SPSS version 25.0). For testing the psychometric properties of the measurement scales and testing the hypotheses, the Analysis of Moment Structures (AMOS version 25.0) statistical software was utilised.

Citation Information: Maziriri, E.T., & Maramura, T. (2022). Green innovation in SMEs: the impact of green product and process innovation on achieving sustainable competitive advantage and improved business performance. *Academy of Entrepreneurship Journal, 28*(1), 1-14.

Demographic profile summary

In the wake of checking for missing values and anomalies, an all out number of 304 questionnaires were finished out of the underlying sample of 321. Now, this resulted in a 94.7 percent reaction rate. Of these, 18 were unusable because a few items on the questionnaire were not answered. The biggest part of the sample showed that there were male 61.5 percent (n=187); trailed by the individuals who revealed that there were female 32.6 percent (n=99). The work figures for this particular sample profile show that the vast majority of the SME organizations utilize less than 50 representatives for each business substance, with 43.1 percent (n=131) of the surveyed representatives in the classification of 10 to 50 representatives and 29.6 percent in the classification of 100 to 200 representatives. Moreover, 25 percent (n=76) of the respondents were in the class of 50 to 100 representatives. The rest of the respondents, 2.3 percent (n=7), uncovered that there were in the class of less than 10 representatives. These discoveries agree with work by Moodley (2002) who states that "SMEs are imperative, in light of the fact that, their potential for employment creation is in numbers". Authors examined the outcomes and how they can be translated in context of previous studies and of the working hypotheses. The findings and their suggestions ought to be discussed in the broadest setting conceivable. Future research headings may likewise be featured.

Summary accuracy statistics for the model

The statistical measurements of the accuracy tests shown in Table 1 show the specific estimates utilised to assess the reliability and validity of the study variables.

Table 1
ACCURACY STATISTICS ANALYSIS FOR THE MODEL

Research Constructs	Item codes	Mean	SD	Cronbach's Test		Item Loadings	CR	AVE	Highest shared variance
				Item-Total	α Value				
Green product innovation	GPI3	4.15	1.663	0.557	0.798	0.588	0.74	0.42	0.10
	GPI5			0.556		0.616			
	GPI6			0.578		0.651			
	GPI7			0.557		0.731			
Green process innovation	GPRI1	4.87	1.334	0.565	0.763	0.696	0.76	0.52	0.11
	GPRI2			0.585		0.727			
	GPRI3			0.630		0.739			
Sustainable Competitive advantage	CA5	3.15	1.113	0.523	0.714	0.619	0.86	0.52	0.02
	CA6			0.627		0.693			
	CA7			0.571		0.886			
	CA8			0.693		0.711			
	CA9			0.590		0.763			
	CA10			0.646		0.603			
Business performance	BP7	3.74	1.289	0.540	0.856	0.560	0.88	0.44	0.11
	BP8			0.571		0.647			
	BP9			0.581		0.627			
	BP10			0.530		0.613			
	BP11			0.546		0.634			
	BP12			0.623		0.720			
	BP13			0.662		0.776			
	BP14			0.589		0.719			
	BP15			0.598		0.748			

Note: C.R=Composite Reliablity; A.V.E=Average Variance Extracted

Citation Information: Maziriri, E.T., & Maramura, T. (2022). Green innovation in SMEs: the impact of green product and process innovation on achieving sustainable competitive advantage and improved business performance. *Academy of Entrepreneurship Journal, 28*(1), 1-14.

Item loadings surpassed the recommended value for each relevant research construct (Aldalaigan & Buttle, 2002). This means that the instruments loaded on their respective variables. As shown in Table, the item loadings ranged from 0,560 to 0,886. The results also show acceptable convergent validity of individual items, as over 50 percent of the variance of each item was shared with a respective construct. The results imply that the items measured converged well to measure what they are supposed to measure and therefore the presence of convergent validity was confirmed. It is imperative to note that GPI1, GPI2 and GPI3 items have been removed on green product innovation. One item that was GPR4 for green process innovation has been removed. In terms of the sustainable competitive advantage, five items were removed, SCA1, SCA2, SCA3, SCA4, SCA5 and for business performance six items, BP1, BP2, BP3, BP4, BP5 and BP6 were deleted. The above items have been removed because the item loads were less than 0.500 and thus, less than 50 percent of variance was explained and the thresholds of equivalent or higher than 0.500 did not reach. To evaluate the internal consistency of each variable, the Cronbach alpha coefficient value was used. The closer the co-efficient is to 1.00, the higher the internal consistency of the items in the scale. All alpha values were between 0.714 and 0.856; the recommended threshold of 7.0 was exceeded, suggesting that all the items on the scale were moving into the same underlying variables. Furthermore, the item-total correlation values ranged from 0.523 to 0.693 which, as recommended by Anderson and Gerbing (1988), the item to total correlation values should be above the cut-off point of 0.5. The higher item to total correlations items reveal convergence among the measured items. Table 1 shows the results of composite reliability. The results produced 0.74 to 0.88 CR indexes. The shown CR level surpassed the estimated criteria of 0.70, recommended for internal consistency of variables. The reliability of the composite scales therefore has been satisfactorily supported. The AVE estimates in Table 1 indicates that the overall amount of variance in the indicators was accounted for by the latent construct (Neuman, 2006). All the AVE values were above 0.4, and were therefore acceptable. Indexes between 0.42 and 0.52 were indicated for AVE values. These findings demonstrated acceptable levels of reliability of the research scale.

Discriminant Validity: Correlation between constructs

The assessment whether the correlations between latent variables were less than 1.0 is one of the processes used to verify discriminant validity of research constructs. As stated in Table 2 for all latent variables, the inter-correlation values are lower than 1.0, which show the existence of discriminant validity. There were no multi-linearity problems, as was a high correlation value above 0.89 (Brown & Cudeck,1993). All correlations values were under 0.8 and were thusly in similarity with the recommended limit, subsequently exhibiting discriminant validity (Fraering & Minor, 2006). The examination additionally utilised AVE as a substitute strategy to check discriminant valifity of the correlation matrix (Nunnally & Bernstein, 1994).

Table 2
INTER-CONSTRUCT CORRELATION MATRIX

Research Constructs	GPI	GPRI	SCA	BP
GPI	1.000	-	-	-
GPRI	0.317**	1.000	-	-
SCA	-0.022	0.010	1.000	-
BP	0.300**	0.328**	0.128*	1.000

Note: GPI=Green product innovation; GPRI= Green process innovation; SCA=Sustianable competitive advantage; BP=Business performance.

Citation Information: Maziriri, E.T., & Maramura, T. (2022). Green innovation in SMEs: the impact of green product and process innovation on achieving sustainable competitive advantage and improved business performance. *Academy of Entrepreneurship Journal, 28*(1), 1-14.

The inter-construction correlations ranged from 0.022 to 0.328, showing signs of discriminant validity. The discriminant validity existed because of very different constructs on the basis of the inter-contructed correlation matrix. Discriminant validity was also recognised by checking whether AVE exceeded SV (Nusair & Hua 2010) as maximum shared variance values. It is idyllic if the Average Variance Extracted (AVE) is larger than 0.4 to ensure reliability of the concept (Fraering & Minor, 2006). The AVE and the utmost common discrepancies for all constructs are shown in (Shows in Table 1) Ziegler and Nogareda (2009).

MEASUREMENT MODEL ASSESSMENT

Confirmatory factor analysis (CFA) was done to examine the reliability, convergent validity and discriminant validity of the multi-item construct measures. "This study has used overall acceptable CFA fit indices. In order to meet the acceptable level, the chi-square (CMIN/DF) value must be confined to 1 and 3, according to Schreiber et al. (2006). The following are the Goodness Index values (GFI), the Comparative Fit Index (CFI) and the IFI, and the Tucker-Lewis Index (TLI) to be equal or more than 0.90 to be acceptable (Bollen, 1990; Hu & Bentler, 1995); In the same way, the average root square approximation error (RMSEA) must be equal to, or lower than,0,08 in order to be accepted (Browne & Cudeck 1993). The recommended figures showed an acceptable data fit for the general model final assessment, namely: $\chi 2/(df)=2,101$, GFI=0.918, TLI=0.932, IFI=0.945, CFI=0.948, NFI=0.918 and RMSEA=0.064.

STRUCTURAL MODEL ASSESSMENT AND HYPOTHESIS TESTING

The results of the CFA were satisfactory and structural equation (SEM) modeling was then applied. A model fit analysis was performed for the SEM phase, prior to testing the hypotheses. The results showed that the ratio between the chi square and the degree freedom was 2 256. This is below the recommended 3.0 threshold and confirms the fitness of the model. The recommended thresholds were respectively met by CFI, RMSEA, NFI, TLI, IFi, GFI and AGFI values which were 0.948, 0.056, 0.932, 0.936, 0.949, 0.942 and 0.916 (West, et al., 2012). The anticipated conceptual model converged well and made it conceivable for the data collected. The hypothesis path modeling test was developed to regulate the strength and weakness of causal relationships. In Figure 2 below the structural model is displayed.

Citation Information: Maziriri, E.T., & Maramura, T. (2022). Green innovation in SMEs: the impact of green product and process innovation on achieving sustainable competitive advantage and improved business performance. *Academy of Entrepreneurship Journal, 28*(1), 1-14.

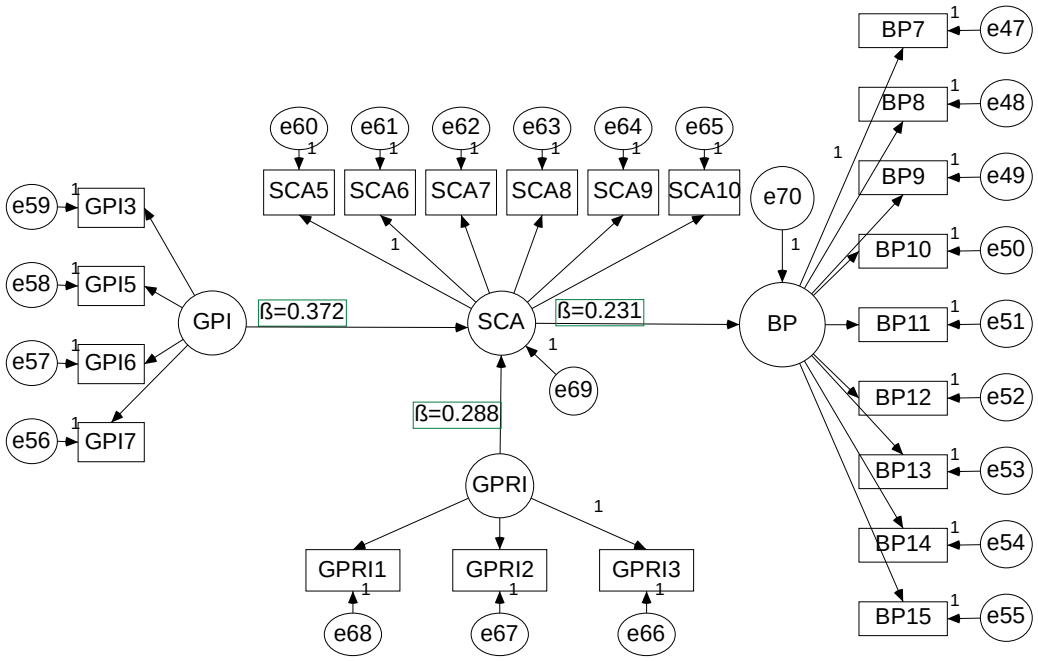

FIGURE 2
SEM PATH MODEL STRUCTURE

Table 3
HYPOTHESISED RELATIONSHIPS AND RESULTING OUTCOMES

Proposed Hypothesis	Hypothesis β	Estimate	*P Value*	Decision rejected/supported
Green product innovation (GPI) → Sustainable competitive advantage (SCA)	$\mathbf{H_1}$(+)	0.372	***	Supported & Significant
Green process innovation (GPRI) → Sustainable Competitive advantage (SCA)	$\mathbf{H_2}$(+)	0.288	***	Supported & Significant
Sustainable competitive advantage (SCA) → Business performance (BP)	$\mathbf{H_3}$(+)	0.231	***	Supported & Significant

**** Significance level <0.001*

These findings have confirmed the fitness of the model and fitness statistics show that the projected conceptual model has been very well merged. By assessing relationships between latent variables, the hypotheses of the study were tested. Table 3 portrays the results generated from the hypothesis test, the discussion of the hypotheses test results are presented hereafter.

DISCUSSION OF RESULTS

The first hypothesis (H_1) in the study specified that green product innovation has a positive effect on sustainable competitive advantage. The survey showed that green product innovation influences a sustainable competitive advantage positively and significantly as indicated through a path coefficient of value of 0.372 and a p-value of 0.001. The result therefore points to the reinforcement of the hypothesis; conversely, the significance level is

Citation Information: Maziriri, E.T., & Maramura, T. (2022). Green innovation in SMEs: the impact of green product and process innovation on achieving sustainable competitive advantage and improved business performance. *Academy of Entrepreneurship Journal, 28*(1), 1-14.

strong. This finding has plenty provision from prior practical research studies such as that conducted by Chen (2008) who found out that, those green product innovations are positively associated with the competitive advantage of firms.

The second hypothesis of the study (H_2) showed that green processes innovation has a positive impact on a competitive advantage. The results showed that the path coefficient value of 0,288 showed a positive impact and the p-value of 0,001 also indicated that this hypothesis was statistically imperative. As a consequence, there has been a positive and significant association between green process innovation and sustainable competitive advantage; meaning that the result of this study enhances the positive relationship between green process innovation and sustainable competitive advantage. The results of this study are in line with Wahid and Lee (2011), who found the positive effect of green process innovation on competitive advantages for companies. The key reason is that waste can be reduced, re-processed and energy used in a more resourceful manner with greener process (Wahid & Lee, 2011).

The third hypothesis (H_3) in the study specified that, sustainable competitive advantage positively impacts business performance. The connection between sustainable competitive advantage and business performance was measured and the findings exposed that positive links existed and the stated hypothesis was strengthened. It means that the sustainable competitive advantage has a positive and stronger influence on business performance The strength of the association is represented by the path coefficient 0.231 at < 0.001, which shows a strong connection. H_3 is supported and important based on the results. Based on the results, the competitive advantage has been demonstrated to have a positive impact on business performance. This study results are reliable with empirical proof from Mohebi and Farzollahzade (2014) who revealed the positive effect of sustainable competitive advantages on the business performance of the SME.

RECOMMENDATIONS

The outcomes of this study cannot be disregarded and may be availed as prospects for manufacturing SMEs. In this way SME proprietors and directors need to look into green innovation opportunities in their item advancement and handle change stages, on the basis of the examinations of writing and more absolutely, within the light of the conclusions of experimental inquire about, from a administration point of view. In order to increase sustainability and subsequent improves to the environment such as reduction of toxic wastes, cleaner manufacturing, energy preservation, leading to benefits for human beings, SME managers should also be conscious of investment in green products and process innovations. SME owners and managers ought to attempt to be more innovative when managing their businesses. It is generally known that if a business is not performing well, there are more chances that it will fail. This belief is a reality as many studies, including those reviewed in this study, confirm it. It is therefore, recommended that for small businesses to realise improved business performance, they need to be engaged in green product innovation and green process innovation.

IMPLICATIONS OF THE STUDY

In conclusion, this study's contribution was structured into three categories: societal implications, implications for theory and practical implications.

Citation Information: Maziriri, E.T., & Maramura, T. (2022). Green innovation in SMEs: the impact of green product and process innovation on achieving sustainable competitive advantage and improved business performance. *Academy of Entrepreneurship Journal, 28*(1), 1-14.

Societal Implications

Since the present study is centred on green innovation it makes significant implications to the societal needs of South Africa. As society develops into more concern regarding the natural environment, most businesses have launched platforms to alter their performances to address humanity's "new" concerns. Hence, the concept of green innovation can address the environmental degradation issues and society's concerns for sustainable development. Moreover, green innovation can have a constructive effect on society because it promotes and takes into account pollution reduction in business.

Implications for Theory

The study's results have significant theoretical implications towards the knowledge base that currently exists in the field of green innovation, sustainable competitive advantage as well as SMEs business performance. The researchers and academic community can use this study as a yardstick for further studies. Students and academicians can utilize this consider as a reference point and attempt to make strides on the regions that are not secured by the analyst within the future inside this field of green development, competitive advantage and SMEs business performance. Furthermore, the findings are expected to be useful for future researchers who will be able to use this study for further research.

Practical Implications

The results of this study have important practical consequences for managers. Precisely, the implications of the results to the practice is that green innovation is a worthwhile strategy to which the management should be committed to gain sustainable competitive advantage, as well as to improve business performance in a competitive industry with a changing dynamic marketing environment. In addition, this study will also help SMEs owners and managers of SMEs operating within the manufacturing sector to identify the necessary green innovation practices that will give them a sustainable competitive advantage, as well as enhance their business performance. Manufacturing companies explicitly provide access, improve their profitability and have a competitive advantage over companies that do not care for the environment, which develop new and improved products and services with environmental inputs in mind.

CONCLUSION

Moreover, this study confirms that elements such as green product innovation and green process innovation help to boost sustainable competitive advantage and company performance. Exceptionally, the study has made significant progress in entrepreneurial innovation and literature by analyzing the interaction between green product innovation, green process innovation, sustainable competitive advantage and business performance methodologically. The study also underlines a new direction of business management research by opening a debate on how important green innovation is in developing entrepreneurial enterprises in South Africa.

REFERENCES

Aldalaigan, A.H., & Buttle, F.A. (2002). System and transactional service quality scale (SYSTRA-SQ): A new measure of bank service quality. *Industrial Journal of Service Industry Management*, *13*(3), 362-381.

Citation Information: Maziriri, E.T., & Maramura, T. (2022). Green innovation in SMEs: the impact of green product and process innovation on achieving sustainable competitive advantage and improved business performance. *Academy of Entrepreneurship Journal, 28*(1), 1-14.

Amankwaa, A., & Anku-Tsede, O. (2015). Linking transformational leadership to employee turnover: The moderating role of alternative job opportunity. *International Journal of Business Administration*, *6*(4), 19-31.

Anderson, J.C., & Gerbing, D.W. (1988). Structural equation modeling in practice: A review and recommended twostep approach. *Psychological Bulletin*, *103*(3), 411.

Arenhardt, D.L., Battistella, L.F., & Grohmann, M.Z. (2016). The influence of the green innovation in the search of competitive advantage of enterprises of the electrical and electronic brazilian sectors. *International Journal of Innovation Management*, *20*(1), 1650004.

Arseculeratne, D., & Yazdanifard, R. (2013). How green marketing can create a sustainable competitive advantage for a business. *International Business Research, 7*(1), 130 -137.

Bollen, K.A., (1990). Overall fit in covariance structure models: Two types of sample size effects. *Psychological Bulletin*, *107*(2), 256–259.

Brindley, C., & Oxborrow, L. (2014). Aligning the sustainable supply chain to green marketing needs: A case study. *Industrial Marketing Management*, *43*(1), 45-55.

Browne, M.W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In Testing Structural Equation Models, ed. KA Bollen, JS Long, Newbury Park, CA: Sage

Brownhilder, N. (2016). Examining the moderating effect of environmental hostility on the entrepreneurial orientation-performance relationship. *Journal of Economics and Behavioral Studies*, 8(6), 6-18.

Bulankulama, S.W.G.K., Khatibi, A., & Herath, H.M.T.N.R. (2014). Mediating effect of Utilization of social media on Social Media Adoptions and Competitive Advantage: Development of a Conceptual Framework. *International Journal of Arts and Commerce*, *3*(2), 1-6.

Cant, M.C., & Wiid, J.A. (2013). Establishing the challenges affecting South African SMEs. *The International Business & Economics Research Journal*, *12*(6), 707-716.

Carneiro, L.M., Cunha, P., Ferreira, P.S., & Shamsuzzoha, A. (2013). Conceptual framework for non-hierarchical business networks for complex products design and manufacturing. Procedia CIRP, *7*, 61-66.

Chakraborty, A., & Roy, M. (2016). The link among innovation drivers, green innovation and business performance: empirical evidence from a developing economy. *World Review of Science, Technology and Sustainable Development, 12*(4), 316-334.

Chang, C.H. (2011). The influence of corporate environmental ethics on competitive advantage: the mediation role of green innovation. *Journal of Business Ethics*, *104*(3), 361-370.

Chen, Y.S. (2008). The positive effect of green intellectual capital on competitive advantages of firms. *Journal of Business Ethics*, *77*(3), 271-286.

Cheng, C.C., Yang, C.L., & Sheu, C. (2014). The link between eco-innovation and business performance: A Taiwanese industry context. *Journal of Cleaner Production*, *64*, 81-90.

Daft, R.L. (2011). The leadership experience (5th Ed). Mason, OH: South-Western Cengage Learning.

Dangelico, R.M., & Pontrandolfo, P. (2010). From green product definitions and classifications to the Green Option Matrix. *Journal of Cleaner Production*, *18*(16-17), 1608- 1628.

Dangelico, R.M., & Vocalelli, D. (2017). Green Marketing": An analysis of definitions, strategy steps, and tools through a systematic review of the literature. *Journal of Cleaner Production*, *165*, 1263-1279.

Davood, G., & Morteza, M. (2012). Knowledge management capabilities and SMEs organisational performance. *Journal of Chinese Entrepreneurship, 4*(1), 35-44.

Dubihlela, J. (2012). Barriers to and determinants and enablers of market orientation: Impact on business performance for small and medium enterprises in South Africa. Philosophiae Doctor in Business Management Thesis. North-West University. Vaal Triangle Campus.

Ebitu, E.T., Ufot, J.A., & Olom, P.A. (2015). Marketing problems and the performance of Selected Small and Medium Enterprises (SMEs) in Southern Senatorial District of Cross River State, Nigeria. *American International Journal of Contemporary Research*, *5*(5), 70-76.

Fraering, M., & Minor, M.S. (2006). Sense of community: An exploratory study of US consumers of financial services. *International Journal of Bank Marketing*, *24*(5), 284-306.

Gaya, H.J., Struwig, M., & Smith, E.E. (2013). Creating a sustainable competitive advantage at a high performing firm in Kenya. *African Journal of Business Management*, *7*(21), 2049-2058.

Guoyou, Q., Saixing, Z., Chiming, T., Haitao, Y., & Hailiang, Z. (2013). Stakeholders influences on corporate green innovation strategy: Case study of manufacturing firms in China. *Journal of Corporate Social Responsibility & Environmental Management*, *20*, 1–14.

Guziana, B. (2011). Is the Swedish environment technology sector 'green'? *Journal of Cleaner Production, 19*, 827-835

Hamann, R., Smith, J., Tashman, P., & Marshall, R.S. (2017). Why do SMEs go green? An analysis of wine firms in South Africa. *Business & society*, *56*(1), 23-56.

Citation Information: Maziriri, E.T., & Maramura, T. (2022). Green innovation in SMEs: the impact of green product and process innovation on achieving sustainable competitive advantage and improved business performance. *Academy of Entrepreneurship Journal, 28*(1), 1-14.

Horng, D., & Huang, K. (2012). The process to affect entrepreneurship: The example of tourism in Taiwan. *African Journal of Business Management*, *6*(25), 7583-7592.

Hu, L.T., & Bentler, P.M. (1995). Evaluating model fit. Structural equation modeling: Concepts, issues, and applications, Sage, Thousand Oaks, CA.

Kawai, N., Strange, R., & Zucchella, A. (2016). Stakeholder Pressures, EMS Implementation, and Green Innovation inMNC Overseas. Department of Economics and Management, Subsidiaries DEM Working Paper Series. *International Business Review, 27*(5), 933-946.

Kimani, J.W (2015). Green marketing practices and Performance of Eco-Tourism in Kenya. Master of Business Administration (MBA) dissertation, School of Business, University Of Nairobi.

Kong, W., Harun, A., Sulong, R.S., & Lily, J. (2014). Influence of conative attitudes towards green advertising on black generation y students‟ environmental behavior. *International Journal of Asian Social Science*, *4*(8), 924-939

Küçükoğlu, M.T., & Pınar, R.Đ. (2015). Positive influences of green innovation on company performance. *Procedia Social and Behavioral Sciences, 195*, 1232-1237.

Kumar, V. (2015). Evolution of marketing as a discipline: What has happened and what to look out for. *Journal of Marketing, 79*(1), 1-9

Kurapatskie, B., & Darnall, N. (2013). Which corporate sustainability activities are associated with greater financial payoffs? *Business Strategy and the Environment*, *22*(1), 49-61.

Lazenby, K. (2018). The strategic management process: A South African perspective. Van Schaik.

Love, J.H., & Roper, S. (2015). SME innovation, exporting and growth: A review of existing evidence. *International Small Business Journal*, *33*(1), 28-48.

Mafini, C., & Omoruyi, O. (2013). Logistics benefits and challenges: the case of SMEs in a South African local municipality. *The Southern African Journal of Entrepreneurship and Small Business Management*, *6*(1), 145- 167.

Mark, J., & Nwaiwu, J.N. (2015). Impact of political environment on business performance of multinational companies in Nigeria. *African Research Review*, *9*(3), 1-10.

Matsuno, K., & Mentzer, J.T. (2000). The effects of strategy type on the market orientation-performance relationship. *Journal of Marketing*, *64*(4), 1-16.

Maziriri, E.T., & Mapuranga, M. (2017). The impact of management accounting practices (MAPs) on the Business Performance of Small and Medium Enterprises within the Gauteng Province of South Africa. *The Journal of Accounting and Management*, *7*(2), 12-27.

Meeus, M., & Edquist, C. (2006). Introduction to Part I. Product and Process Innovation. Innovation, Science and Institutional Change. A Research Handbook, 23-37.

Mohebi, M.M., & Farzollahzade, S. (2014). Improving competitive advantage and business performance of SMEs by creating entrepreneurial social competence. MAGNT Research Report, 2 (Special Issue), 20-26

Moodley, S. (2002). Global market access in the Internet era: South Africa's wood furniture industry. *Internet Research: Electronic Networking Applications and Policy*, *12*(1), 31- 42.

Mthabela, T.E. (2015). Assessing the causal failures of emerging manufacturing SMEs in Johannesburg (Doctoral dissertation). University of the Witwatersrand.

Nanath, K., & Pillai, R.R. (2017). The influence of green IS practices on competitive advantage: mediation role of green innovation performance. *Information Systems Management*, *34*(1), 3-19.

Neto, J.F.D.R., Souza, C.C.D., Gallego, P.A.M., Pareira, F.D.A.R., Bono, J.A.M., & Lopez, M.D.R. (2015). The organizational capabilities of rural enterprises, incremental innovation, and the university's contribution. *African Journal of Agricultural Research, 10*(21), 2203-2212.

Neuman, L.W. (2006). Social research methods: Qualitative and quantitative approaches. 6th edition. Boston: Pearson International Education.

Njoroge, P.M. (2015). Marketing strategies and the performance of small and medium enterprises in matuu town, machakos county, Kenya (Doctoral Dissertation, School Of Business, University Of Nairobi).

Nunnally, J.C., & Bernstein, I.H. (1994). Psychometric theory (McGraw-Hill Series in Psychology). New York: McGraw-Hill.

Nusair, K., & Hua, N. (2010). Comparative assessment of structural equation modeling and multiple regression research methodologies: E-commerce context. *Tourism Management*, *31*, 314-324.

Omar, C.M.Z.C., & Anas, T. (2014). E-commerce in Malaysia: Development, implementation and challenges. *International Review of Management and Business Research*, *3*(1), 291-298.

Osuga, P.O. (2016). The effects of strategic innovation on the performance of SMEs in Nairobi Countym (Doctoral dissertation, United States International University-Africa).

Rennings, K., & Rammer, C. (2009). Increasing energy and resource efficiency through innovation-an explorative analysis using innovation survey data. Discussion Paper No. 09-056. Centre for European Economic Research.

Citation Information: Maziriri, E.T., & Maramura, T. (2022). Green innovation in SMEs: the impact of green product and process innovation on achieving sustainable competitive advantage and improved business performance. *Academy of Entrepreneurship Journal, 28*(1), 1-14.

Schreiber, J.B., Nora, A., Stage, F.K., Barlow, E.A., & King, J. (2006). Reporting structural equation modeling and confirmatory factor analysis results: A review. *The Journal of Educational Research*, *99*(6), 323–338.

Shapfi, A.A. (2015). The effects of access to finance on the productivity and profitability of small and medium enterprises in the manufacturing sector of Ethiopia. Doctor Technologiae. Tshwane University of Technology, Pretoria

Shakeel, M., & Khan, M.M. (2011). Impact of Guerrilla Marketing on Consumer Perception. *Global Journal of Management and Business Research, 11*(7), 47-53.

Small Enterprise Development Agency (SEDA) (2012). Analysis of the needs, state and performance of small and medium businesses in the Agriculture, Manufacturing, ICT and Tourism Sectors in South Africa. Final report. Available online: http://www.seda.org.za/Publications. [4 April 2017].

Terziovski, M. (2010). Innovation practice and its performance implications in small and medium enterprises (SMEs) in the manufacturing sector: a resource-based view. *Strategic Management Journal*, *31*(8), 892-902.

Van Scheers, L., & Makhitha, K. M. (2016). Are Small and Medium Enterprises (SMEs) Planning for Strategic Marketing in South Africa? *Foundations of Management*, *8*(1), 243-250.

Wahid, N.A., & Lee, T.T. (2011). Product, process and combined green innovations on firm's competitive advantages. *Elixir Marketing*, *38*, 4330-4334.

West, S.G., Taylor, A.B. & Wu, W. (2012). 'Model fit and model selection in structural equation modeling', in R.H. Hoyle (ed.), Handbook of structural equation modeling, pp. 209–231, Guilford Press, New York

Willig, J.T. (1994). Environmental Tqm. McGraw-Hill Companies.

Xie, X., Huo, J., Qi, G., & Zhu, K.X. (2016). Green process innovation and financial performance in emerging economies: Moderating Effects of Absorptive Capacity and Green Subsidies. *IEEE Transactions on Engineering Management*, *63*(1), 101-112.

Ziegler, A., & Nogareda, J.S. (2009). Environmental management systems and technological environmental innovations: Exploring the causal relationship. *Research Policy*, *38*(5), 885-893.

Received: 23-Nov-2021, Manuscript No. AEJ-21-9966; **Editor assigned:** 25-Nov-2021, PreQC No. AEJ-21-9966(PQ); **Reviewed:** 10-Jan-2022, QC No. AEJ-21-9966; **Revised:** 24-Jan-2022, Manuscript No. AEJ-21-9966(R); **Published:** 31-Jan-2022

Citation Information: Maziriri, E.T., & Maramura, T. (2022). Green innovation in SMEs: the impact of green product and process innovation on achieving sustainable competitive advantage and improved business performance. *Academy of Entrepreneurship Journal, 28*(1), 1-14.