

The Impact of Innovation Competitive Advantage on Product Quality for Sustainable Growth among SMEs: An Empirical Analysis

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Abstract

Supported by the dynamic capabilities theory of the firm, this study considered innovation competitive advantage, product quality, and technology adoption as the core dynamic capabilities of manufacturing SMEs. The purpose of this study was to investigate the impact of two components of innovation competitive advantage, that is, customer preference and strategic business model, on product quality for sustainable growth among SMEs. It also examined the mediating effect of technology adoption on the relationship between innovation competitive advantage and product quality. Survey data was collected from 245 manufacturing SMEs in Nigeria and analysed using partial least squares structural equation modelling. The results revealed that customer preference does not directly affect product quality; however, technology adoption mediates the relationship between customer preference and product quality. The strategic business model was found to have a significant positive effect on product quality,

and this relationship was mediated by technology adoption as well. This research recommends that manufacturing SME managers recognise that improving product quality through innovation competitive advantage strategies and technology adoption is advantageous for the sustainable growth of SMEs.

Keywords: Innovation competitive advantage, Product quality, Customer preference, Strategic business model

1. INTRODUCTION

Maintaining product quality in a changing marketplace has become increasingly strenuous for manufacturers. This growing challenge has made it a requirement for owner managers worldwide to persistently improve their quality performance (Teh et al., 2015). Often, it leaves them with no choice other than leveraging innovation competitive advantage to offer attractive product quality to customers. Innovation competitive advantage can be described as an enterprise's capability to productively create new competitive advantage through the discovery of new and better approaches and the introduction of these approaches to the marketplace (Nimfa et al., 2020; Porter, 1990). In fact, under prevailing dynamic conditions, quality efficiency, innovation, and new product development constitute critical elements of competitive advantage (Li et al., 2009; Subramanian et al., 2019). For instance, Piveteau and Smagghue (2019) found that organisations add products to their export portfolio when their quality increases and their costs decline. As quality has shifted to five distinct paradigms (i.e. transcendent, product-based, user-based, manufacturing-based, and value-based) (Sebastianelli, & Tamimi, 2002), quality improvements cannot be made solely via minor modifications to standard product processes. On the contrary, leveraging product quality for competitive advantage entails substantial changes to manufacturing patterns, customer preferences, and strategic business models, especially among small and medium-sized enterprises (SMEs) whose sustainable growth requires urgent attention. Scholarship efforts have thus been made to understand the significant impact of product quality on the competitive advantage and sustainable growth of SMEs (Vermeulen, & Witjes, 2016).

In this regard, innovation has a positive effect on product quality and leads to a continuum of sustainable and strategic growth. Innovation incorporates as well as addresses numerous key elements of product quality, such as: the general life phase of services and products; management systems and their integration; business models; supply chain management; and the development and implementation of competitive methods (Sukitsch et al., 2015). Daidj (2014) noted that technological innovation can dramatically change the marketplace, transform favourable areas for nations, and reap competitive rewards for firms. Likewise, Chen and Gayle (2019) argued that firms' sharing of technology can emphatically influence their product quality. Consequently, innovation competitive advantage allows enterprises to build their business strategy, process, partnerships, and quality around a sustainable growth model (Dirsehan, 2015; Sheng et al., 2013). In particular, it has a diverse effect on the operations of SMEs and, more broadly, the constantly shifting international SME market (Nimfa, & Gajere, 2017).

Previous studies have focused on the links between knowledge transfer and innovation competitive advantage (Sheng et al., 2013; Whalen, & Han, 2017) and organisational cultures, innovation competitive advantage and the sustainable growth of SMEs (Nimfa et al., 2020).

The first gap in prior research revealed that more research is needed to increase understanding of innovation competitive advantage benefit, which can help improve policy for SMEs' long-term business growth (Dirsehan, 2015; Conto et al., 2016; AlQershi et al., 2021) because each company's goal in today's competitive marketplace is to outperform the competition and gain new customers (Hana, 2013). Hence, innovation is regarded as a major driver of economic growth and competitiveness (Terziovski, 2010; Khurana et al., 2021; Brancati et al., 2021). Based on the foregoing, SMEs can promote product quality as a customer-focused initiative by assessing the importance of innovation competitive advantage factors such as customer preferences and strategic business model capabilities.

The second research gap in prior studies shows that, despite the potential impact of innovation competitive advantage on product quality, the relationship between innovation competitive advantage and product quality has not received much attention, creating a gap in the extant literature between customer preference, strategic business model and product quality (Sheng et al., 2013; Dirsehan, 2015; Whalen, & Han, 2017; Nimfa et al., 2020). Most notably, there is a lack of a broader understanding of the real impact of innovation competitive advantage on product quality for sustainable growth in the context of SMEs.

The third research gap in past studies illustrates the paucity of empirical study on the mediating effect of technology adoption between customer preference and strategic business model on product quality for sustainable growth among SMEs. Thus, technological strategy can be self-contained, promote business learning and communication, be a more assertive product and process innovation, or be a preferable alternative to technology advancement (Martinez-Román, & Romero, 2017; Camisón, & Villar-López, 2014; Mothe et al. 2015).

Fourth, another main issue is that a number of factors (e.g. novel products, product tastes, product innovative thinking, and customer switching inclination) have made it challenging for SMEs to build better product quality. Additionally, the impacts of the innovation competitive advantage variable on

product quality for sustainable growth among small and medium-sized enterprises has not been empirically tested and is as yet understudied.

There is thus a critical need for empirical research on innovation competitive advantage and product quality among manufacturing SMEs, specifically in developing economies.

Therefore, the current study investigated the impact of two components of innovation competitive advantage (customer preference and strategic business model) on product quality for sustainable growth among manufacturing SMEs in Nigeria. This study also investigated the mediating role of technology adoption in the relationship between the components of innovation competitive advantage and product quality in the SME context.

2. LITERATURE REVIEW

2.1 Product Quality

To ensure that products receive constant market attention from users, quality sustainability must be at the centre stage of a manufacturing SME. Quality is regarded as the fundamental and significant source of an organisation's customer satisfaction, customer loyalty, and profitability (Atiyah, 2016). Sebastianelli and Tamimi (2002) pointed out that the user-based definition of quality involves aesthetics and perceived quality while the product-based definition of quality relates to performance and features. Alternatively, Fields et al. (2014) proposed a manufacturing-based definition of quality, which emphasises processes that create a product or service that conforms to specifications. Such quality increases customers' preference and continued patronage, which leads to product quality sustainability in SMEs (Jain et al., 2020). SMEs often play a key role - as innovators who inspire customers' perceptions of product quality (Dhewanto et al., 2020). Accordingly, they have emerged as top performers on the basis of product quality, packaging, and innovative capabilities (Scheers, & Mmatli, 2019). However, their product lines are not unique when they manufacture goods that are inherently similar to those of competing brands. Therefore, to stimulate their sustainable growth, SMEs have to lead the dynamic marketplace by continuing to focus on product quality to satisfy customers.

2.2 Customer Preference

SMEs, particularly manufacturing SMEs, are transactional businesses in a highly competitive, complex, and fast-changing business environment which depends on customers' preferences (Sathya, & Indrajith, 2018; Sirgy et al., 1997). Therefore, SMEs are charged with the responsibility of considering customer preference a priority, as this represents a significant competitive advantage for firms. Customer preference is regarded as a customer's manifestation of wants in terms of product characteristics and prospective product opportunities; it is therefore a requisite consideration in the creation of design concepts (Cao et al., 2010; Cao et al., 2011). To illustrate, Zanini et al. (2019) showed that shopping streets are more attuned to customer preferences, despite the larger satisfaction created by shopping malls. Household size and gender are, meanwhile, socioeconomic variables that have the strongest effects on consumer preference (Bovea et al., 2018; Jamal, & Goode, 2001). Since consumers frequently buy goods at face value without utilising them first, a product's physical appearance is another important variable that influences customer preference in terms of how customers perceive the quality of a product (Mugge et al., 2018).

2.3 Strategic Business Model

To ensure long-term competitiveness, companies need to develop the capability to research, plan, and build new business areas (Dobni, 2010; Heger, & Rohrbeck, 2012; Morecroft, 2015). Towards this end, a business model is a description of an organisation and how it functions in attaining its goals, such as profitability, growth, and social impact (Betz, 2018; Massa et al., 2017). It has proven to be a necessary instrument to bring new technologies and ideas to the market and serves as a driver of innovation to unlock technological potential (Geelhoed, 2017; Pucihar et al., 2019; Teece, 2010). Haaker et al. (2017) recognised robustness as the capability of a business model to stay viable and workable in a changing business environment. Consistent with this notion, a strategic business model indicates that strategic thinking has to be constantly reinforced in the creation and growth of an organisation's business activities. The strategic ability to move into new business models quickly and successfully is an important source of competitive advantage and leverage that enhances the sustainability performance of organisations, including SMEs (Betz, 2016; Bouwman et al., 2018; Geissdoerfer et al., 2018b; Gordijn et al., 2005). Therefore, the strategic business model as a key element of innovation competitive advantage has become notable in business sustainability research.

2.4 Technology Adoption

Organisations are currently undergoing major transformations in response to megatrends taking place worldwide, which necessitate the development of smart, digital, and virtual capabilities (Sola et al., 2015). Essentially, no SMEs would function without the availability and adoption of technology. Warner and Wäger (2019) explained that digital transformation is the ongoing process of using new digital technologies in everyday organisational life, which recognises agility as the core mechanism for the strategic renewal of an organisation's business model, collaborative approach, and eventually culture. Technology has thus been central in this transformation and has made service innovations technically workable and economically viable (Hsu et al., 2019; Nag & De, 2020). Technological innovation capabilities (TICs) are important for SMEs to obtain core competencies and to upgrade their competitive advantages (Rahim, & Zainuddin, 2019). In fact, a survey of Chinese high-technology companies revealed that cost leadership, customer orientation, and creative marketing promote better product innovation performance in environments with high dysfunctional competition (Liu, & Atuahene-Gima, 2018). As such, SME innovators need to understand adoption patterns to customise their products and to predict the performance of their innovations in the marketplace (Oke et al., 2014).

2.5 Dynamic Capabilities Theory

The dynamic capabilities theory of the firm is a theoretical framework that explains how firms differ and compete, taking into account that firms have to evolve and reconfigure their operations to remain competitive (Heaton et al., 2019; Mikalef et al., 2016). This theory has been defined as a firm's formation of capacities, possession of opportunities, and avoidance of threats while simultaneously preserving its competitive advantage through the improvement, combination, protection, or rearrangement of its tangible and intangible assets (Bagheri et al., 2019; Faghah et al., 2018). The dynamic capabilities theory has advanced the understanding of innovation by building on resource-creation processes that firms use to create new resources and regenerate existing resources in line with changes in the environment (Bownam, & Ambrosini, 2003; Fallon-Byrne & Harney, 2017; Teece et al., 1997). Fainshmidt et al. (2019) and Nimfa et al. (2019) realised that the relationship between dynamic capabilities and competitive advantage is contingent upon the strategic fit between organisational and environmental factors, contributing to a more rigorous and configurational dynamic capabilities view. In this study, dynamic capability explains the relationship of innovation competitive advantage's two components (customer preference and strategic business model) with product quality, while technology adoption is considered a core dynamic capability needed by SMEs to sustain growth in the competitive manufacturing sector. Thus, based on this view, SMEs have to keep abreast of the capabilities of their innovation competitive advantage to ensure that their product quality meets customer preferences and represents a strategic business model that is not replicable by competitors. This will allow SMEs to lead the market and enjoy more sustainable growth.

3. HYPOTHESES DEVELOPMENT AND CONCEPTUAL FRAMEWORK

3.1 Customer Preference and Technology Adoption for Sustainable Growth among SMEs

The relationship that exists between customer preference and technology adoption has recently attracted empirical attention, as inconsistencies in customer preference appear to influence technology changes in an organisation (Tripsas, 2008). Srivastava and Barnir (2016) found that a significant association exists between customer-firm interaction (CFI) and numerous individual, firm, and environmental factors, supporting the notion that in entrepreneurial and small firms, CFI is used strategically to support market position. In a similar vein, previous scholars have highlighted the role of customer dynamics and customer experience in applying innovative smart technologies in a retail setting (Foroudi et al., 2018). Further, empirical evidence indicates that despite the rise in online banking, retail banking customers continue to focus on face-to-face interaction (Durkin et al., 2003). There is also a need for insight into customers' cross-technology use, such as their alternating preference for interactive social networks, online business knowledge, and reliable chain-based payment methods (Connell et al., 2019; Piehler et al., 2019).

Hollebeek et al. (2019) proposed the development of technology-specific user segmentation as a requirement to leverage firms' evolving technological capabilities. While many customers use core technology (e.g. electronic fund transfer at the point-of-purchase), technologies that are non-core or more peripheral to the market offering (e.g. gamification-based promotions) see varying adoption levels across customer segments, including in terms of demographics, psychographics, or brand- or marketing-related preferences (Hollebeek et al., 2018; Weiger et al., 2019). For instance, the expectations of customers and hotel owners were found to be a continuum of network preferences in terms of the provision of hotel services (Liu, & Hung, 2020). Similarly, customers open to the use of

integrated home technologies have been revealed to take advantage of their ability to delegate interaction with technology and, since they are humanising technology, they want technology to meet social roles and expectations (Letheren et al., 2019).

Thus, a satisfactory touch/technology balance is needed in SMEs' technology adoption in emerging disruptive conditions to maximise customers' well-being from using brand- or firm-related innovations (Robertson et al., 2019). However, the discussion above illustrates how the relationship between customer preference and technology adoption remains unresolved. Therefore, it was hypothesised that:

H1: Customer preference has a significant positive effect on technology adoption for sustainable growth among SMEs.

3.2 Customer Preference and Product Quality for Sustainable Growth among SMEs

Evidence from previous research shows that a product differentiation strategy predicts product quality (Prajogo, 2007). Similarly, product appearances that score high on natural, low on novelty, and neutral on compression trigger the most positive ease of use perceptions (Mugge et al., 2018). Also, Sun et al. (2018) discovered a significant positive relationship between the intention to purchase and the purchase of recycled products, while Razak et al. (2016) found that product quality improvement and competitive prices increase customer satisfaction. Consistent with these findings, Anojan and Subaskaran (2015) found that consumer preference significantly affects buying behaviour. At the early stage of product concept generation, customer preference has a direct impact on the number of iterative designs, scheme evaluations, and cost (Cao et al., 2015).

Sathya and Indrajith (2018) posited that leaders of manufacturing organisations know the importance of having accessible, timely, accurate, and consistent information to establish, nurture, and manage customer relationships. Hong et al. (2018) noted that consumers' negative perceptions of online reviews decrease their online purchase intentions and vice versa. Liu et al. (2014) further revealed that customer perceptions of corporate responsibility enhance customers' brand preference. Another study by Chen et al. (2006) found that three forms of a firm's intellectual capital (human capital, systemic capital, and relational capital) have significant positive correlations with product design success. Vinokurova (2019) stated that firms adjust to customer preferences to deliver product quality. Understanding and incorporating customer preferences in product design is therefore important to improve product quality for SMEs' sustainable growth. However, the relationship between customer preference and product quality has remained understudied, particularly in the manufacturing SME context. Therefore, we hypothesised that:

H2: Customer preference has a significant positive effect on product quality for sustainable growth amongst SMEs.

3.3 Strategic Business Model and Technology Adoption for Sustainable Growth among SMEs

Evidence from previous research indicates multiple attempts to analyse the relationship between the strategic business model and technology adoption. In particular, Leandros and Papadopoulou (2020), Singh and Gaur (2018), Antikainen and Valkokari (2016), and Pires and Aisbett (2003) established that organisations have historically been urged to implement information communication technology (ICT) to facilitate the pursuit of innovative business models. Yet simply entering business-to-business e-commerce that requires new business strategies to be implemented is inadequate (Centobelli et al., 2020; Massa et al., 2017). Kihara et al. (2016) found that during the strategy implementation process, there is a strong positive relationship between commitment to technology requirements and the success of manufacturing SMEs. Likewise, Zarath and Covin (1993) found that technology policy choices vary widely among organisations with different business strategies, and that business strategy influences the strength of the relationship between company success and specific technology policies (Boons, & Lüdeke-Freund, 2013; Rizos et al., 2016; Ünal et al., 2019). Pires and Aisbett (2003) agreed that any technology adoption has to be determined within the individual firm context. Nevertheless, existing research fails to sufficiently recognise the relationship between the strategic business model and technology adoption among manufacturing SMEs. Consequently, based on the above discussion, it was hypothesised that:

H3: The strategic business model has a significant positive effect on technology adoption for sustainable growth among SMEs.

3.4 Strategic Business Model and Product Quality for Sustainable Growth among SMEs

The customer is central to an organisation and assessing customer satisfaction is a vital element in any strategy for business performance improvement; this makes customer satisfaction a driver of survival, competitiveness, and growth (Hoe, & Mansori, 2018). Kutscha (2016) revealed that market turbulence significantly predicts business model transformations in small firms, while technological turbulence does so for SMEs. Given the growing competition in the modern business environment, there is an increasing trend to launch new products or to improve the quality of end products to attract more consumers (Chakraborty et al., 2018; Geissdoerfer et al., 2018a). A study by Teece (2010) investigated business models, business strategy and innovation. The author noted that the essence of a business model is its definition of how the business delivers value to customers, entices customers to pay for value, and converts those payments into profit. Ammar and Chereau (2018) found that the strategy-business model innovation alignment is contingent on the level of fit between strategic profile attributes and ideal profile attributes. Kim et al. (2018) argued that the efficiency of small business owners increases as functional integration increases, satisfying utilitarian motivations. The authors, however, noted that a platform with greater integration that has a social presence in satisfying hedonic motivations improves the efficiency of all small businesses. Hence, it can be deduced from empirical findings that the relationship between a strategic business model and product quality has ambiguities. It was thus hypothesised that:

H4: The strategic business model has a significant positive effect on product quality for sustainable growth among SMEs.

3.5 Technology Adoption and Product Quality for Sustainable Growth among SMEs

The usage of technologies by small businesses, especially the usage of information communication technology (ICT), has steadily grown in recent times (Mazzarol & Reboud, 2020). Extant research has proposed that SMEs embrace information technology (IT) for many purposes originating from internal and external stress that directly or indirectly affects them (Nguyen, 2009). Chege and Wang (2020) found that technological innovation influences environmentally friendly practices that have a positive effect on a company's performance. Neirotti et al. (2020) implied that the integration of information technology (IT) is linked to the strategic ability of SMEs, independent of access to infrastructural resources. Also, scholars have argued that IT planning capabilities have a positive effect on the development of IT-based technologies and IT investment choices. Hagspiel et al. (2020) found that innovation not only due to technological advances but also due to market scarcity can be advantageous for the company. Consumer volatility and supply chains have adverse effects on information technology capabilities (Neirotti et al., 2020). Thus, the role of value chains in new technology adoption appears to be negligible (Burkitbayeva et al., 2019; Janssen, & Swinnen, 2019; Kuijpers, & Swinnen, 2016). Further, the utilisation of technology and value creation in hospitality organisations were found to be not significantly associated (Collins & Reutzel, 2017; Nimfa et al., 2019). The discussion above suggests inconclusive findings on the relationship between technology adoption and product quality. Therefore, the following hypothesis was formulated:

H5: Technology adoption has a significant positive effect on product quality for sustainable growth among SMEs.

3.6 Technology Adoption as a Mediator

Technology adoption by individuals and organisations, since the early days of computing, has been a subject of research interest and efforts to date have generally resulted in inconclusive findings (Moore, 1991). Factors such as ease of use, time management, consumer attention, and technology acceptance have been found to affect technology adoption at all levels (Eze et al., 2019; Regenfelder, & Slowak, 2011; Slowak, 2008). Naicker and Van Der Merwe (2018) further showed that perceived user-friendliness, perceived efficiency, perceived difficulty, and perceived costs are key factors in overall technology adoption, while perceived risk is a key factor specifically in mobile technology adoption. Also, Hsu et al. (2019) showed that access to technological innovation promotes operation innovation in the context of social technology.

In addition, information technology has been used by scholars to determine the potential of an enterprise to leverage its technological assets (Kim et al., 2018; Mikalef et al., 2016; Wang et al., 2019). Fawcett et al. (2011) found that information technology investments make their biggest contribution by creating a diverse capacity for supply chain collaboration. Awa et al. (2017) reported that the associations between technology adoption and the factors of technology, organisation, climate, and research have been statistically validated, although some have negative coefficients. Oke et al. (2014), meanwhile, pointed out that both perceptions of technology and technology adoption have a

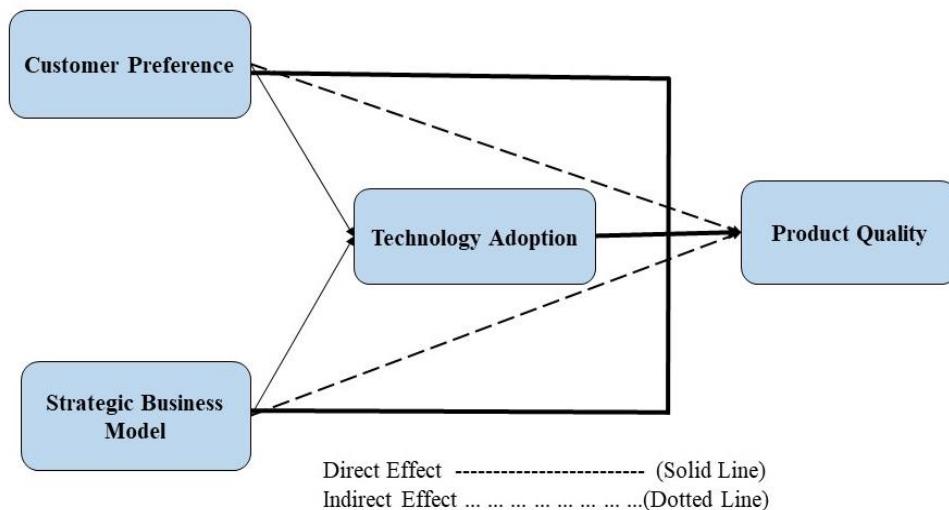
significant economic impact. This is because when technology advances, operational performance improves, resulting in significant changes and organisational growth (Davis et al., 1989; Gardner, & Amoroso, 2004; Lin, & Chang, 2011; Museli, & Navimipour, 2018). Moreover, Bagheri et al. (2019) found that technology innovation significantly mediates the influence of internationalisation on the efficiency of firms, especially among SMEs with moderate rates of innovation. The dynamic capacity perspective allows us to understand the link between technology adoption, innovation competitive advantage, and product quality among SMEs, as they are excellent capabilities for business enterprises; however, scholars have ignored the prospective role of technology adoption in a changing business landscape (Rojas et al., 2017; Teece, 2012; Wenzel et al., 2020). Thus, the dynamic capabilities theory extends the conventional knowledge of technology adoption by providing novel insight into the actual role of technology adoption in the influence of innovation competitive advantage components of (customer preference and strategic business model) on product quality. Overall, SMEs that strategically shape, change, and upgrade their business models and meet customer preferences through technology adoption would have sound values (Achtenhagen et al., 2013; Maier et al., 2013) and would inevitably experience sustainable growth in terms of product quality. Based on this discussion, the following hypotheses were developed:

H6: Technology adoption positively and significantly mediates the effect of customer preference on product quality for sustainable growth among SMEs.

H7: Technology adoption positively and significantly mediates the effect of the strategic business model on product quality for sustainable growth among SMEs.

Figure 1 shows the conceptual framework of this study that was derived from the theoretical foundations discussed earlier.

Figure 1: Conceptual Framework



4. RESEARCH METHOD

To assess the influence of the two components of innovation competitive advantage (customer preference and strategic business model) on product quality for SMEs' sustainable growth, a quantitative approach was employed.

4.1 Sampling

The research sample was drawn from SMEs in Nigeria. SMEs engaged in manufactured goods trading and licensed as contractors/suppliers of major manufacturing companies were chosen, in line with the study's scope. Selected SMEs were classified by firm size based on the SME definition in the Nigerian context, where firms with one to nine employees are considered 'micro', firms with 10 to 49 employees are considered 'small' and firms with 50 to 199 employees are considered 'medium' (NBS/SMEDAN, 2017).

The Nigerian SME corporate database reported that 2825 SMEs in the federal capital territory of Abuja and 1574 SMEs in Jos met the study criteria, bringing the total population surveyed to 4399

SMEs. As per Krejcie and Morgan's (1970) sample size recommendation, 354 SMEs were randomly selected from the population for questionnaire administration. The questionnaires were answered by owner-managers or company managers where there were no owner-managers available. Face-to-face, drop-off, and email methods were employed to distribute the questionnaire, culminating in 315 returned copies. Of these, only 245 questionnaires were complete, yielding a response rate of 69 percent. The collected data was subsequently cleaned and analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) with the aid of SmartPLS 3.0 software.

4.2. Measures

All the questionnaire items in this study were chosen from extant measures of the constructs which had proven reliabilities and validities. Innovation competitive advantage was measured using its components: customer preference and strategic business model. Customer preference was measured with three items adapted from Sirgy et al. (1997) and Jamal and Goode (2001), just as strategic business model was measured with three items based on previous literature (Bouwman et al., 2018; Pucihar et al., 2019; Teece, 2010). Four items measured product quality as per Parasuraman and Grewal's work (2000), while technology adoption was measured using four items employed in several earlier studies (Davis et al., 1989; Gardner & Amoroso, 2004; Lin & Chang, 2011; Maier et al., 2013; Moore & Benbasat, 1991; Premkumar & Roberts, 1999; Teo et al., 2007; Venkatesh et al., 2003). All constructs were measured on a five-point Likert type ranging from '1= Totally Disagree' to '5= Totally Agree'.

5. RESULTS

5.1 Demographic Profile

Table 1 shows the demographic profile of the study participants, i.e. owner-managers or company managers of manufacturing SMEs. A majority of the respondents were from small SMEs (59.2%), while 28.2 percent were from micro-sized SMEs and 12.7 percent were from medium-sized SMEs. In terms of age, most SME managers appeared to be from the younger generation, with more than 80 percent aged between 24 and 39 years old. The gender of the respondents was also equally distributed between males and females. The educational qualification results of the respondents showed that a majority of almost 62 percent held Master's degrees, while 20 percent held Bachelor's degrees and 18.4 percent had doctorate degrees. The mean values for all items ranged between 3.64 and 4.02. Thus, respondents generally agreed with the questionnaire items.

Table 1: Demographic Profile

Item	Category	Frequency	Percentage (%)
Gender	Male	123	50.2
	Female	122	49.8
	Total	245	100
Age	18-23	29	11.8
	24-29	65	26.5
	30-35	59	24.1
	36-39	78	31.8
	40 and above	14	5.7
Education	Total	245	100
	Bachelor	49	20.0
	Masters	151	61.6
	Ph.D	45	18.4
Size	Total	245	100
	Micro	69	28.2
	Small	145	59.2
	Medium	31	12.7
	Total	245	100

5.2. Common Method Variance (CMV)

Common method variance (CMV) is the threat of biased outcomes in data analysis. This research utilised Harman's single-factor test (Bell, 2019; Podsakoff, & Organ, 1986) to diagnose the data for CMV. The results of the principal component factor analysis showed that the highest value of a single factor explained 45.11 percent of the total variance, which is less than the threshold of 50 percent (Doty, & Astakhova, 2020; Kumar, 2012; Uzir et al., 2020). Hence, bias from common method variance was deemed non-existent in this study and was not a major concern.

5.3 Measurement Model Assessment

To perform PLS-SEM analysis, the measurement model was first assessed to ensure the validity and reliability of the study model. The model's convergent validity and reliability were analysed through evaluating the factor loadings, Cronbach's alpha (CA), Average Variance Extracted (AVE) and Composite Reliability (CR). Table 2 illustrates the measurement model: the factor loadings satisfy the recommended value above 0.6 (Hair et al., 2019; Hair et al., 2014). The CA met the recommended value higher than 0.70, the value range from 0.71 to 0.84. The AVE value of four variables were within the range 0.638 and 0.767, which fulfilled the recommended value above 0.50. The CR ranging from 0.841 to 0.908 also fulfilled the criteria as it was above the minimum recommended value of 0.70 (Hair et al., 2019).

To examine the multicollinearity, this study applied the outer variance inflation factor (VIF) criterion (Kock 2015; Jony, & Serradell-López, 2021). A study will have multicollinearity allied issues when the outer variance inflation factor (VIF) values are more than 10 (Shieh, 2010). Accordingly, the findings of this present study indicated that all the VIF values mentioned were in line with the recommended values, which range 1.486 to 2.437 (Hair et al., 2017, Hair et al., 2019) This result indicates that all items had VIF values below 3.33, which proved the non-existence of multicollinearity issues in this study (Hair et al., 2017; Howard, & Nitzl, 2020).

Table 2: Reliability and Convergent Validity Results

Constructs	Items	Loadings	Cronbach's Alpha	CR	AVE
Customer Preference	CP1	0.84	0.84	0.908	0.767
	CP2	0.87			
	CP3	0.90			
Strategic Business Model	SBM1	0.83	0.71	0.841	0.638
	SBM2	0.80			
	SBM3	0.76			
Technology Adoption	TA1	0.76	0.81	0.878	0.644
	TA22	0.81			
	TA33	0.83			
	TA4	0.78			
Product Quality	PQ1	0.75	0.83	0.891	0.673
	PQ2	0.83			
	PQ3	0.88			
	PQ4	0.79			

Table 3: Discriminant Validity through Heterotrait-Monotrait (HTMT)

	Customer Preference	Strategic Business Model	Technology Adoption	Product Quality
Customer Preference				
Strategic Business Model	0.643			
Technology Adoption	0.665	0.708		
Product quality	0.576	0.687	0.786	

The discriminant validity for the model was assessed using the heterotrait-monotrait (HTMT) ratio of correlations, which should be less than 0.85 (Henseler et al., 2015; Voorshees et al., 2016). Based on Table 3, the study constructs met the discriminant validity criteria as well.

5.4. Structural Model Assessment

Table 4 shows the results for the path coefficient analysis of the direct hypotheses (H1 to H5). Customer preference and strategic business model were found to positively and significantly impact technology adoption ($\beta=0.370$, $p=0.000$; $\beta=0.358$, $p=0.000$). Likewise, strategic business model and technology adoption also had significant positive effects on product quality ($\beta=0.0.219$, $p=0.012$; $\beta=0.0.468$, $p=0.000$). However, the effect of customer preference on product quality was found to be not significant ($\beta=0.119$, $p=0.092$), possibly due to the high costs associated with product quality (Uzir et al., 2020). Customers are generally price sensitive, leading companies to develop products as per the demand of customers to survive in the market. Therefore, customer preference does not need to be emphasised differently.

Overall, all the direct hypotheses were supported with the exception of Hypothesis 2.

Table 4: Path Coefficient Analysis Results

Hypothesis	Relationship	Std. Beta	SE	T-Value	P Values
H1	Customer Preference → Technology Adoption	0.370	0.076	4.882	0.000
H2	Customer Preference → Product quality	0.119	0.070	1.690	0.092
H3	Strategic Business Model → Technology Adoption	0.358	0.068	5.283	0.000
H4	Strategic Business Model → Product quality	0.219	0.087	2.517	0.012
H5	Technology Adoption → Product Quality	0.468	0.085	5.513	0.000

The study model displayed satisfactory coefficients of determination (R2), where 48 percent of product quality and 40 percent of technology adoption was explained by their respective predictors (Table 5). Next, in terms of effect size, Table 6 shows that customer preference had a negligible effect on product quality but had a medium effect on technology adoption. Meanwhile, the strategic business model had a small effect on product quality and a medium effect on technology adoption. Finally, technology adoption had a medium effect on product quality. However, Chin et al. (2003) explained that a small effect size does not always reflect the insignificance of the construct, especially when the beta coefficient result is substantial. Thus, all the predictor variables in this study had meaningful effects on product quality and technology adoption. The final step in the structural model assessment was the test for predictive relevance (Q2), the results of which are shown in Table 7. According to Hair et al. (2017), a value of 0.02 shows small relevance, 0.15 shows medium relevance and 0.35 shows large relevance for endogenous constructs. Based on this guideline, this study's endogenous variables, product quality and technology adoption exhibited medium predictive relevance values in the model.

Table 5: Coefficient of Determination (R2) Results

	R Square	R Square Adjusted
PQ	0.480	0.474
TA	0.400	0.395

Note: PQ is product quality; TA is technology adoption

Table 6: Effect Size (f^2) Results

	PQ	TA
CP <i>(No effect)</i>	0.017	0.170 <i>(Medium)</i>
	0.059 <i>(Small)</i>	0.159 <i>(Medium)</i>
SBM <i>(Medium)</i>	0.253	

Note: PQ is product quality; TA is technology adoption; CP is customer preference; SBM is strategic business model

Table 7: Predictive Relevance (Q^2) Results

	SSO	SSE	$Q^2 (=1-SSE/SSO)$
CP	735.000	735.000	
PQ	980.000	672.646	0.314
SBM	735.000	735.000	
TA	980.000	731.328	0.254

Note: *PQ* is product quality; *TA* is technology adoption; *CP* is customer preference; *SBM* is strategic business model.

5.5. Mediation Effect Assessment

The mediating effect of technology adoption on the relationship between innovation advantage (customer preference and strategic business model) and product quality was analysed using the Preacher and Hayes (2008) bootstrapping method. The analysis results, shown in Table 8, indicate that technology adoption significantly mediates the influence of customer preference and strategic business model on product quality, thus supporting Hypothesis 6 and Hypothesis 7. In addition, the mediation effect was evident because the 95 percent confidence intervals did not straddle a zero between the lower and upper intervals (Preacher & Hayes, 2008).

Table 8: Mediation Analysis Results

		Direct Effect	Indirect Effect	Total Effect	VAF	Mediation
6. Customer Preference → Technology Adoption → Product Quality		0.119	0.173	0.292	59.2%	Partial mediation
7. Strategic Business Model → Technology Adoption → Product Quality		0.219	0.168	0.387	43.4%	Partial Mediation

As a supplementary step, the indirect effect of the mediation was calculated using the Variance Accounted For (VAF) value, presented in Table 8. According to Hair et al. (2016), a score between 20 percent and 80 percent indicates partial mediation, while a score above 80 percent indicates full mediation. The results show that at 59.2 percent and 43.4 percent, technology adoption partially mediated the relationship between innovation competitive advantage (customer preference and strategic business model) and product quality.

6. DISCUSSION

This study has provided valuable insights into product quality for sustainable growth among manufacturing SMEs in Nigeria. The findings showed that customer preference and the strategic business model have a positive and significant impact on technology adoption and the strategic business model, and technology adoption also has a positive and significant effect on product quality. Additionally, technology adoption mediates both relationships between customer preference and product quality, as well as the strategic business model and product quality.

The study findings were assessed in several ways: First, the results demonstrate the importance of innovation competitive advantage in the context of customer preference and strategic business model for product quality in the SME sector. Specifically, this implies that a strategic business model has a direct and indirect impact on product quality, while customer preference has an indirect impact on product quality through technology adoption. These results are consistent with the view that enterprise actions on technology initiative vary considerably due to the different state-of-the-art strategic business models and that the business strategy reflects the strength of the relationship between business growth and technology adoption (Betz, 2016, 2018; Zarah, & Covin, 1993; Rizos et al., 2016; Ünal et al., 2019).

Customers are the basis of any business organisation that seeks to meet their demand in a profitable way. Therefore, business success and expansion depend on customer satisfaction, which in turn leads to sustainable growth. Thus, Drucker (1973) argued that satisfying the consumers or users is the mission and purpose of every business. More so, a firm can earn more revenue as well make more profit, since customer preference is an important factor. Identifying customer preference is a key success element in developing the product/service. Once determined, a firm may develop and manufacture a product in accordance with the customer's choice, which will help retain existing customers and attract new customers. Likewise, technology adoption is important to SMEs in order to

reach the customers and read their inner stimuli. Also, technological advancements can help to produce the right product and service that customers want. Therefore, technological innovation in product quality meets the customers' demand for better offers than from other competitors. Thus, technology adoption mediates the relationship between customer preference and product quality. In view of the importance of identifying customer preferences and offering innovative products according to their choice, SMEs should focus on assessing customer preferences and developing the right innovation and time-demand product with the help of state-of-the-art technology. This effort will increase the customer base, market share and future profit for the sustainable growth of the enterprise.

Secondly, success for small and medium enterprises also depends on the strategic business model that the firm promotes and with which it competes with its competitors. A strategic business defines the business objectives, accomplishes its operations, designs the tactics, involves an innovative and creative plan for developing innovative products. Product-oriented firms may produce a customer-oriented product once the strategic business model permits or predicts. A business model can design the customers'-demand product and maintains its quality if the firm adopts new technology in the production system. Therefore, technology adoption and innovation strengthen the relationship between the strategic business model and product quality in the sustainable growth among SMEs. This is in tandem with the previous related studies like (Whalen, & Han 2017; Bos-Brouwers, 2010) who argued that greater insight into the innovative features of SMEs and an evaluation of sustainable innovation initiatives offer opportunities to enhance sustainable quality product/service growth. However, this study's outcome did not agree with the view of (Baierle et al., 2020) that most innovative ideas have a low influence on building a competitive advantage for manufacturing SMEs. The empirical evidence of this study also supports the dynamic capabilities theory, positing innovation competitive advantage as a core capability essential for SMEs' success (Bleadby et al., 2018; Nimfa et al., 2020).

Olovsson and Lundstrom (2010) indicated that all entrepreneurs have the skills to build diverse capacities in the process of sensing, seizing and redesigning opportunities. In addition, the authors asserted that three main factors, i.e. maintaining a sustained long-term vision, focusing on customer needs, and using skills and resources wisely, make SME innovators successful and help them maintain sustainable growth and efficiency. The findings of this study are consistent with Nimfa et al.'s (2020) findings that innovation competitive advantage has a significant positive impact on the sustainable growth of SMEs. This study's findings also have implications for managers or owners of manufacturing SMEs. SME managers are encouraged to develop strategic business models as a way of strengthening their innovation competitive advantage. Additionally, they should improve technology adoption within their firms to increase product quality for sustainable growth.

7. CONTRIBUTIONS/IMPLICATIONS

This study makes a number of valuable theoretical contributions to the existing body of literary knowledge on dynamic capabilities theory (Teceee 1997; Teece, 2012). It has empirically confirmed the link between the innovation competitive advantage components of customer preference and strategic business models and product quality. Also, it contributed to the existing body of knowledge by confirming that technology adoption explains the indirect impact of innovation competitive advantage (customer preference and strategic business model) on product quality in sustaining the growth of SMEs, which has not been investigated in prior studies. In addition, this study extends the perspective of the dynamic capabilities theory (DCT) to understand the direct and indirect effects of innovation competitive advantage on product quality through technology adoption among SMEs. It also contributes to the strategic management literature by examining the unresolved issue concerning the relationship between innovation competitive advantage and product quality for sustainable growth among SMEs.

This research also has implications for SME owners and policymakers. The findings suggest that SMEs that manage product quality using a greater level of innovation competitive advantage via their strategic business model are more capable of achieving sustainable growth. This is because SMEs that are strengthened by their innovation competitive advantage are more likely to improve and maintain product quality, which engenders customer satisfaction. In addition, with the implementation of technology adoption, customers do not just experience more satisfaction but also greater preference for the product over a longer period of time. The study also suggests that policymakers and SME owners should encourage technology adoption through well-designed and well-articulated approaches to leverage their customer preference and strategic business model as a dynamic capacity to improve product quality for sustainable SME growth.

8. CONCLUSIONS

This study has found that the first component of innovation competitive advantage, customer preference, does not have a significant effect on product quality; however, it has a significant positive effect on technology adoption. The second component of innovation competitive advantage, the strategic business model, exhibits a significant positive effect on both product quality and technology adoption. Also, technology adoption was revealed to have a significant positive effect on product quality. Further, customer preference and the strategic business model were shown to have indirect effects on product quality through the mediation of technology adoption. In summary, customer preference only affects product quality when mediated by technology adoption, whereas strategic business model has both direct and mediated effects on product quality. This research has thus discovered that positive links do exist between innovation competitive advantage and product quality for sustainable growth among SMEs. It therefore acknowledges that innovation competitive advantage is, in fact, an excellent strategy that can be employed by managers of manufacturing SMEs to improve product quality for sustainable growth.

9. LIMITATIONS AND FUTURE DIRECTIONS

This research investigated only SMEs, which points to methodological limitations in terms of the generalisability of the results. As the study was conducted on manufacturing SMEs in the Nigerian context, other types of SMEs, such as service-based SMEs and micro enterprises, should be examined in future studies. Upcoming studies should also use better sampling techniques and sample sizes to broaden generalisability, since the current study was limited to specific geographical areas in Nigeria. Another limitation of the study is the cross-sectional nature of the survey, which does not permit for assessment of causes and effects that change with time. The analysis also focused largely on the self-report of SME managers to measure SME practices, which may not reflect the actual practices of the firm. As such, future studies may consider including more diversified stakeholders of SMEs as respondents to procure a better understanding of their operations. Additionally, this research only studied one mediating variable, technology adoption, which provides opportunities to integrate more mediating variables in future studies on innovation and product quality. Innovation competitive advantage itself can be explored more as an intervening or mediating variable in upcoming research. Finally, as this study was conducted in a developing country, the research model could be extended to both second and first world countries to test its applicability.

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Appendix: Questionnaire on Innovation Competitive Advantage and Product Quality for Sustainable Growth amongst SMEs

A. General Information:

- a. SMEs size: i. Micro [] ii. Small [] iii. Medium []
- b. Age: 18-23 [] ii. 24-29 [] iii. 30-35 [] iv. 36-40 [] v. 41- 45 [] vi. 46-50 [] vii. 51 and above []
- c. Gender: i. Male [] ii. Female []
- d. Educational Qualification: i. Bachelor/HND [] ii. Master [] iii. PhD/M.Phi. [] iv. Diploma/National Diploma (ND) [] v. SSCE/FSLC []

B. Innovation Competitive Advantage and Product Quality

Please indicate your degree of agreement with the following statements related to innovation competitive advantage and Product Quality for sustainable growth amongst SMEs through the Likert-type scale below and tick the appropriate number accordingly (1 = Totally disagree, 5 = Totally agree)

Construct	Items	1	2	3	4	5
Product quality	1. The materials used by the brand are natural/genuine					
	2. The materials used by the brand are natural/genuine					
	3. The products of the brand are reliable					
	4. The brand offers products with excellent features					
Innovation competitive advantage	Customer Preference					
	1. Our customers preferred the new innovative brand ideas.					
	2. Our customers prefer appealing nature of our new product brand					
	3. Our customers prefer the new innovative culture					
	Strategic Business Model					
	1. Our enterprise gives attention to customer needs different from traditional customer needs					
	2. Our enterprise has value creation for increasing technology development.					
Technology Adoption	3. Our enterprise aims to create multiple innovations annually.					
	1. Technology will enable accomplish tasks more quickly.	1	2	3	4	5
	2. Technology will improve the quality of the work.					
	3. Adoption of technology is consistent with our organisation's values and beliefs.					
	4. Technology will provide timely information for decision-making					