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Technological capability, relational capability and firms' performance

Role of
learning
capability

The role of learning capability

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Abstract

Purpose – The purpose of this paper is to empirically evaluate the mediating role of learning capability on the relationship between technological capability, relational capability and small and medium enterprises (SMEs) performance in developing economy of Africa.

Design/methodology/approach – A quantitative survey design was employed to collect the data from owner/manager of manufacturing SMEs in Nigeria. Partial least square structural equation model was used in the evaluation of both the measurement and structural models to determine the reliability and validity of the measurement and test the hypotheses, respectively.

Findings – The statistical result indicates a positive relationship between technological capability, learning capability and SMEs performance. Equally, relational capability significantly and positively relates to SMEs learning capability. However, relational capability negatively relates to SMEs performance, while technological capability also negatively relates to learning capability. Furthermore, learning capability mediates the negative relationship of relational capability and SMEs performance to significant positive relationship, while it does not mediate the relationship of technological capability and performance.

Research limitations/implications – The analysis of this study is restricted to only resource-based view and dynamic capability theory. Data of the study were collected once a time on a self-reported technique. The study contributed significantly to the body literature on technological and relational capabilities and performance. It also demonstrated the need for SMEs manager to recognize and appreciate the roles of these strategic capabilities in achieving sustainable competitive position.

Practical implications – Through relational capability SMEs develops efficient collaborative relationship to acquire new techniques, knowledge. This is specifically, essential for SMEs firms from less developing and emerging economies as they are lagging behind at the global competitive platform, and that the possession of specific advantage locally may not be adequately enough to help penetrate the global markets. Similarly, technological capability enable firms to identify acquire and apply new external knowledge to develop operational competencies which may lead to the attainment of superior performance.

Social implications – Government policies and programs designed to support technological development and innovation must be adjusted to consider the peculiar nature of SMEs firms in terms of technology and innovativeness that enhances competitive position and performance.

Originality/value – This study empirically examined the relationship of technological and relational capabilities and the SMEs learning capability and performance.

Keywords Learning capability, Technological capability, Relational capability, SMEs performance

Paper type Research paper



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1. Introduction

Intense competition has undermined the performance of small and medium enterprises (SMEs) in developing economies as they try to expand the scope of their operation and market. The desire of SMEs firms to keep in pace with the development in the global technological business environment has been constrained by several factors which include inadequate commitment to acquire the new technologies, lack of technical and networking skills, inadequate human capital and improper choice of technology (MAN, 2017; Mefuna & Abe, 2015). Consequently, the industrial and commercial landscapes were dominated by foreign factors and products (MAN, 2017). Hence, African countries under the banner of the African Continental Free Trade Agenda have demonstrated commitment to improve the economic and commercial activities of the region through the enhancement of the SMEs firms' competitive advantage locally and at global front. In this regard, Nigerian Government has introduced several programs and policies such as the National Information Technology Development Agency, the National Industrial Revolution Plan, National Office for Technology Acquisition and Promotion, among others, to help SMEs firms improve the capacity to develop or imitate the universally acknowledged industrials technologies and enhance their ability in assimilating new technologies to satisfy the peculiar needs of the country (NIRP, 2014).

However, due to the dearth of open standards, SMEs need to create distinctive capabilities and product to effectively expand and internationalize their operations and survive the globalization effects (Rugraff, 2012). The resource-based view (RBV) and the dynamic capability view have for decades demonstrated the crucial role of capabilities in enhancing firm's competitive advantage and performance (Teece, Pisano, & Shuen, 1997; Barney, 1991; Wernerfelt, 1984). Therefore, technological capability and relational capability are essential dynamic capabilities that enable firms to achieve and maintain sustainable competitive advantage and superior performance in competitive global business environment (Yang, Xie, Liu, & Duan, 2018; Wang, Lo, Zhang, & Xue, 2006; Teece *et al.*, 1997). However, inefficient capabilities have constrained the business activities and performance of SMEs (Sok, Snell, Lee, & Sok, 2017), especially, in African economies where human capital, technological, collaborative and innovative capabilities upset the competitiveness and performance of the sector (Asante, Kissi, & Badu, 2018; Akeyewale, 2018; Oyelaran-Oyeyinka & Abiola Adebowale, 2012). Nevertheless, extant literatures have established that technological, relational and learning capabilities are valuable, rare, inimitable and non-substitutable resources and dynamic capabilities that enhance the sustenance of competitive advantage and performance in rapidly changing environment (Yang *et al.*, 2018; Pham, Monkhouse, & Barnes, 2017; Ahmad, Othman, & Mad Lazim, 2014). However, these capabilities have been studied on firms from plastic industry (Chantanaphant, Nabi, & Dornberger, 2013), professional and financial services (Ulbrich & Borman, 2017; Ainin, Kamarulzaman, & Farinda, 2010), healthcare, (Salas-Vallina, López-Cabrales, Alegre, & Fernández, 2017), constructions (Manley & Chen, 2015) and aviation industry (Rajasekar & Fouts, 2009), mostly from western developed world, the USA, Latin America and Emerging Asian economies.

Conceptualizing learning capability as mediator is consistent with the work of Hailekiros and Renyong (2016) and Wang *et al.* (2006). The concept of learning capability in the field of research and among practitioners has greatly grown over the years due to its importance to the dynamic business environment (Alegre & Chiva, 2008). Nevertheless, the concept of learning capability (Goh, Elliott, & Quon, 2012; Sok & O'Cass, 2011; Alegre & Chiva, 2008) emphasizes the importance of some facilitating factors for efficient organizational learning and innovative performance. Hence, technological and relational capabilities are essential dynamic capabilities in changing what the firm knows by internalizing new knowledge (Pham *et al.*, 2017; Zawislak, Alves, Tello-Gamarra, Barbieux, & Reichert, 2013). These capabilities are therefore considered essential to the adaptation and assimilation of new

knowledge and techniques to improve performance. Furthermore, Sukoco, Hardi, and Qomariyah (2018) sought for an investigation of the potential mediating role of learning on the relationship of firm's capabilities and performance. Nonetheless, limited attention has been given to the empirical examination of the mediating role of learning capability on the association of the technological and relational capabilities and the performance of SMEs in developing economies. Therefore, this study aimed to empirically examine the mediating role of learning capability on the relationships between technological capability, relational capability and the performance of SMEs in developing economies of Africa. In achieving this, the study answered the following research questions:

- RQ1. Does technological capability significantly relate to SMEs performance?
- RQ2. Is there any significant relationship between SMEs relational capability and performance?
- RQ3. Does technological capability significantly relate to SMEs learning capability?
- RQ4. Does relational capability significantly relate to SMEs learning capability?
- RQ5. Is there any significant relationship between SMEs learning capability and performance?
- RQ6. Does learning capability mediate the relationship between technological capability, learning capability and SMEs performance?

2. Theoretical background and hypotheses development

2.1 *Technological capability and performance*

Technological capability has been described as the firm's ability to design and develop new process, product and upgrade knowledge and skills about the physical environment in unique way, and transforming the knowledge into instructions and designs for efficient creation of desired performance (Wang *et al.*, 2006). Technological capability entails not only technical mastery capability, but also the capacity to expand and deploy the firm's core capabilities, and effectively combine the different streams of technologies and mobilize technological resources throughout the firms (Zawislak, Alves, Tello-Gamarra, Barbieux, & Reichert, 2012). Furthermore, technological capability comprises the body of practical and theoretical knowledge, procedures, experience, methods and physical equipment and devices (Ahmad *et al.*, 2014). Technological capability represents a firm's superior and heterogeneous technical resources which meticulously related to the design technologies, product technologies, information and process technologies, sourcing and integration of external knowledge (Bergek, Tell, Berggren, & Watson, 2008). These components of technological capabilities are responsible for significant positive variation in firm's performance (Bergek *et al.*, 2008).

Technological capability enables firm to identify, acquire and apply new external knowledge to develop operational competencies, which leads to the attainment of superior performance. Through effective technological capability, a firm creates and delivers new products and services in better and efficient way that best satisfies the customer needs, thus enhances the overall success of firm's new product development and performance (Wang *et al.*, 2006). Hence, technological capability enables SMEs firms to endure the effects of dynamically changing business environment throughout the life of business, right from the startup to the age of corporate social responsibility. Effective development of technological capability in SMEs firms entails becoming open-minded to the development in technological environment, perpetual accumulation of valuable knowledge and deployment of the current technologies effectively (Ahmad *et al.*, 2014; Bergek *et al.*, 2008; Wang *et al.*, 2006). Therefore, effective

combination of appropriate operational capabilities enhances the strength of firm's technological capability. Technological capability has been established in allowing firms to develop and deliver valuable product or services to customers and ensure effective customer relationship which positively enhance performance (Reichert & Zawislak, 2014; Ahmad *et al.*, 2014; Zawislak *et al.*, 2013; Wang *et al.*, 2006). Thus, this study hypothesizes that:

H1. Technological capability positively relates to SMEs performance.

2.2 Relational capability and performance

SMEs firms generally find it very challenging to penetrate into new and unfamiliar marketing environment mainly because of the resource constraint and strategic capabilities (Pham *et al.*, 2017). The dynamic operating environment requires business firms to work with not only innovation partners, but also collaborates with all strategic public and private organizations to draw external information and resources to improve competitive position and performance (Kolk, Eagar, Boulton, & Mira, 2018). Thus, through relational capability SMEs can develop collaborative relationship to efficiently acquire new techniques, knowledge and information (Martins, 2016). This is specifically essential for business firms from less developing and emerging economies as they are lagging behind on the global competitive platform, and that the possession of specific advantage locally may not be adequately enough to help penetrate the global markets (Yiu, Lau, & Bruton, 2007). Hence, Lado, Paulraj, and Chen (2011) urged that SMEs firms must tirelessly cultivate and leverage relational capability to generate and provide superior customer's utilities. This has also been underscored by Ghane and Akhavan (2014), who mentioned that relational capability is critical to the execution of strategy and programs aimed at reducing customers' complaints, creating cordial relationship and enhancing satisfaction.

Relational capability is an essential strategic capability that enables business firms effectively identify, access and acquire technologies and knowledge as well as skills which the firm cannot personally provide (Hietajärvi, Aaltonen, & Haapasalo, 2017). SMEs firm that efficiently develop its relational capability creates effective collaboration, which enhances its competitive position. Collaboration with strategic partners affects SMEs resilience, agility and robustness which enhance service delivery (Wieland & Wallenburg, 2013). Engaging relevant partners in the process of new product development is strategically sensible, giving the exceptional expertise and resources the firm cannot independently provide. Nevertheless, it may not be easy for a firm to exploit such strategic benefits without relational capability. However, evolving strategic relationship with partners is valuable when it leads to the creation of more benefits to the firm. Therefore, to sufficiently generate rent from relationship with external partners, firm's generative learning and integration ability must be effective to create value (Albort-Morant, Leal-Rodriguez, & De Marchi, 2018).

SMEs firms deliberately design and form strategic collaborative relationship to improve the source of competitive advantage (Ziggers & Henseler, 2009). Relational capability creates defensible competitive advantage by enabling SMEs to develop and leverage inter-firm collaboration into beneficial relationship. Luvison and de Man (2015) opined that with active relational capability SMEs firms achieve superior alliance portfolio performance. It is an essential capability that enhances SMEs relational values and performance (Cheng, Chen, & Huang, 2014), and significantly influences internal quality suppliers and customers integration, which, in turn, enhances performance (Yu & Huo, 2018). Relational capability significantly affects firm's operational performance (Yang *et al.*, 2018; Rungsithong, Meyer, & Roath, 2017). It also impacts positively on firm's financial performance (Lado *et al.*, 2011). Pham *et al.* (2017) reported that relational capability does not only positively enhance performance, but it is efficient in marketing intelligent, pricing and communication performance:

H2. Relational capability positively relates to SMEs performance.

2.3 Technological capability and learning capability

Technological capability plays a crucial role in the attainment of firm's efficiency in innovativeness and production process. It is generally associated with the knowledge and skills necessary for a business firm to develop, use, adapt, absorb and transfer technologies (Mori, Batalha, & Alfranca, 2016). Firm's technology can be regarded as part of the extensive body of knowledge, techniques, system and tools available for the generation, distribution and the usage of goods and services by the final destination. A firm's technological change can be appreciated as a continuing process to generate and absorb technologies that enable the firm to competitively produce and offer valuable product to the market. Wang *et al.* (2006) opined that the positive impacts of technological capability on firm's performance demonstrated the potential of this capability to stimulate mediating variables such as firm's learning.

It has been demonstrated that technological capability improves firm's learning capability, organizing and manufacturing capabilities, as well as resource allocation capability (Baark, Lau, Lo, & Sharif, 2011). Consequently, technologically oriented firms have the will and ability to acquire important technological knowledge and apply them in the business operation process. Hence, the development process of firm's technological capability has been established to be a path dependent development process, which started with learning by doing and followed by learning by adaptation to enhance productivity through proficient utilization and adaptation of technological knowledge (Ray, 2008). It is therefore essential to state that technological capability increases firm's efficiencies in developing innovative idea and knowledge that enable SMEs firms to achieve distinctive performance in reaction to the changing marketing environment. Technological capability allows SMEs firms to enhance internal process, which ultimately minimize the cost of operations, logistic and manufacturing processes for achieving competitive performance (Song, Nason, & Di Benedetto, 2008). Technological expertise is critical in acquisition and integration of external knowledge, thus detailed technological understanding is required to effectively acquire and exploit new knowledge (Lichtenthaler, 2016). Technological skills are considered crucial in bringing innovative idea and better product design (Masa'deh, Al-Henzab, Tarhini, & Obeidat, 2018). Therefore, technological capability has been considered to be an essential factor in changing what a firm knows by internalizing new knowledge (Ahmad *et al.*, 2014; Zawislak *et al.*, 2013; Baark *et al.*, 2011; Wang *et al.*, 2006). Thus, this study hypothesizes that:

H3. Technological capability significantly relates to SMEs learning capability.

2.4 Relational capability and learning capability

The RBV perspective of relational capability urged that valuable and rare resources are embedded in the relationship rather than in an individual firm. Rungsithong *et al.* (2017) demonstrated that relational capability is grounded in firm's knowledge sharing, thus firms in strategic relationship need capability that supports and expedites sourcing of new idea and knowledge from other partners. The pressures from the highly competitive environment pose on to the SMEs a challenging task of meeting multiple demands of several forces that works together in the attainment of common goals (Mat & Razak, 2011). Rungsithong *et al.* (2017) advocated that relational capability at firm's level is driven by employee's emotion and feeling through inter-personal trust. Employees in an enterprise reached common understanding and improved the speeding in sharing information through strategic relationship. Therefore, the creation of strategic relationship encourages efficient communication by ensuring the accuracy and the speedy spread of information and knowledge (Santos-Vijande, López-Sánchez, & Trespalacios, 2012). These initiatives need more informal exchange mechanism to complement the process so that every knowledge and information, which

individuals acquire, is transformable (Martins & Canhoto, 2016). In collaborative relationships, information resources of partner firms are integrated and activated through cooperation and interaction with each other to create and share valuable information (Ngugi, Johnsen, & Erdélyi, 2010). Consequently, the relational view advocated that when vertical power asymmetries exist among the collaborating business partners, the potential for extreme knowledge utilization by major and stronger partners is generally offset by the complementarities of the weaker partners (Obayi, Koh, Oglethorpe, & Ebrahimi, 2017). Therefore, relational capability has been established to positively influence marketing intelligent gathering (Pham *et al.*, 2017), enhance firm's cultural orientation (Luvison & de Man, 2015), capability for the co-value creation and information sharing (Ngugi *et al.*, 2010), and expedite the conversion of customer knowledge into specific market product (Sánchez-Gutiérrez, Cabanelas, Lampón, & González-Alvarado, 2018):

H4. Relational capability significantly relates to SMEs learning capability.

2.5 Learning capability and performance

Learning capability has been described as a firm's features and management qualities directed toward the promotion and support of a learning process (Fang, Chang, & Chen, 2011). It consists of the firm's necessary resources employed in diagnosing the employee's training need, evaluation of fruitless business activities and the process of transmission of information and knowledge learnt among the employees. Learning capability is an essential resource which enhances firm's efficiency, innovativeness and performance (Santos-Vijande *et al.*, 2012). Learning capability supports firm in improving productivity, sensing market opportunities, adjusting business activities, minimizing cost and new product delivery methods to the market (Sok & O'Cass, 2011). It determines the potential of SMEs firm to survive, innovate and flourish in the market (Jerez-Gómez, Céspedes-Lorente, & Valle-Cabrera, 2005).

SMEs firm that successfully developed and continuously advances its ability in learning creates superior competitive advantage (Clements, 2010; Bhatnagar, 2006). Learning capability enable SMEs create the foundation for strategic learning, which facilitate adaptability and the attainment of competitive advantage (Santos-Vijande *et al.*, 2012; Moon & Lee, 2015). Limpibunternrg and Johri (2009) demonstrated that learning capability is a symbiotic to firm's innovation. Hence, learning and knowledge are crucial factors responsible for significant changes in overall performance (Prieto & Revilla, 2006). It is critical in nurturing and promoting strategic orientation of SMEs firms (Hakala & Kohtamäki, 2011). Learning capability improves the process of SMEs radical innovation development and facilitates other capabilities in supporting both incremental and radical innovations (Peris-Ortiz, Devece-Carañana, & Navarro-Garcia, 2018). Alegre and Chiva (2008) established that learning capability enhances employee's emotional intelligence and job satisfactions. It boosts the influence of transformational leadership on employee's happiness at work (Salas-Vallina *et al.*, 2017), it also enhances total quality management culture (Lam, Poon, & Chin, 2006) and the impacts of human resource practice on firm's performance (Hooi & Ngui, 2014). Learning capability is an essential factor that improves firm's efficiency in competitive strategies and providing customer value in the modern markets (Santos-Vijande *et al.*, 2012). Empirically, numerous studies have demonstrated the positive impacts of learning capability on firm's financial and market performances (Peris-Ortiz *et al.*, 2018; Visser, 2016; Moon & Lee, 2015; Santos-Vijande *et al.*, 2012; Goh *et al.*, 2012; Tohidi, Seyedaliakbar, & Mandegari, 2012; Limpibunternrg & Johri, 2009; Bhatnagar, 2006; Prieto & Revilla, 2006). Therefore, this study hypothesized that:

H5. Learning capability positively relates to SMEs performance.

2.6 Mediating role of learning capability

Learning capability is a strategic capability for business survival in this dynamic and competitive business environment (Santos-Vijande *et al.*, 2012; Sok & O’Cass, 2011; Calantone, Cavusgil, & Zhao, 2002). Learning has been considered as a qualitative instrument that smoothens organizational and employee’s rigidity (Chiva, Alegre, & Lapiedra, 2007; Wang *et al.*, 2006). With effective learning capability, employees and SMEs firm would not only acquire and spread information related to technological markets, rather can equally examine frequently the quality of the firm’s storage and interpretive functions and the soundness of the overriding logic that guides the entire learning process (Hailekiros & Renyong, 2016; Wang *et al.*, 2006). Through learning capability, SMEs firm can motivate employees to exert adequate effort, create an environment that inspires creativity and innovativeness and ensure judicious deployment of physical and intangible resources to create superior values. Therefore, SMEs firms that are learning oriented can effectively leverage their technological and relational capabilities to create superior customers value, enhance competitive advantage and achieve distinctive performance. Yu and Huo (2018) urged that business firm can obtain the information needed not only from internal experiences, but also from the external partners’. Relationship with external partners helps firms attain continuous learning cycle and encourages additional external collaboration (Hillebrand & Biemans, 2003).

Accordingly, technological knowledge and information are not easily transferred (Lichtenthaler, 2016), thus requiring efficient role of knowledge acquisition, transformation, assimilation and exploitation (Gray, 2006). In this regard, Chen, Fung, and Yuen (2019) underscored the role of learning capability in the enhancement of firm’s dynamic capabilities. Learning ability facilitates flexibility which enhances firm’s agility in developing operational capability (Ahmed, Najmi, Mustafa, & Khan, 2019). Learning has been established to influence other environmental factors to enhance performance (Escrig, Broch, Gómez, & Alcamí, 2016; Mallén, Chiva, Alegre, & Guinot, 2015; Hooi & Ngui, 2014; Alegre & Chiva, 2008; Akgün, Keskin, Byrne, & Aren, 2007; Keskin, 2006):

- H6. Learning capability mediates the relationship between technological capability and SMEs performance.
- H7. Learning capability mediates the significant relationship between relational capability and SMEs performance.

3. Methodology

3.1 Research design

Cluster sampling techniques was adopted in this study. Cluster sampling is a probability sampling technique that is being used in a study that covers a wide geographical area (Sekaran & Bougie, 2013). Consequently, the study area (northern Nigeria) was divided into three clusters based on the three geo-political zones of the region; one state was randomly selected from each zone. Specifically, Bauchi state was selected from north-east, while Kano and Niger states were selected to represent north-west and north-central, respectively. A five Likert scale survey questionnaire (strongly disagree, disagree, undecided, agree and strongly agree) was developed to collect the data. The survey questionnaires were administered personally on 370 top managers of manufacturing SMEs operating in the study area. Out of the 370 questionnaires distributed to the owner/managers of SMEs, 241 questionnaires were retrieved. However, during physical inspection of the retrieved questionnaires, three questionnaires were identified as incomplete, thus discarded. Consequently, 238 valid questionnaires were keyed into the Statistical Package of Social Science (SPSS 24.0) for the purpose of the evaluation of the potential outliers. The result of

the univariate test reveals nine potential univariate outliers. Conversely, there was no potential multivariate outlier identified from the multivariate analyses. So, 229 valid responses were used to examine the relationship of the hypotheses established. Furthermore, the analyses of none response bias between the early and late respondent reveal no significant difference.

3.2 Measurement

The survey measurement items of all the variables in this study were adapted from previous literatures. Specifically, the six measurement items of SMEs performance adapted from the work of Santos and Brito (2012) examine the extent to which SMEs achieve its main goals of satisfying the needs of various stakeholders. Equally, to determine how SMEs firm upgrade its knowledge and skills about the physical environment in a unique way and transforming the knowledge into instructions and designs for efficient creation of desired performance, technological capability was measured with 11 items adapted from the study of Wang *et al.* (2006). Furthermore, the nine items used to measure relational capability in this study were adapted from Pham *et al.* (2017), to ascertain how SMEs develop effective collaboration with strategic partners to access information and resource which cannot be independently provided to effectively satisfy the market needs. However, learning capability was measured with seven items adapted from the work of Hailekiros and Renyong (2016), which evaluates the degree of SMEs commitment toward the promotion and support of the firm's learning process to directly enhance performance and influence other capabilities to improve competitive advantage and performance.

3.3 Treatment of common method variance (CMV)

All the data in this study were collected from the same source at a time. Consequently, this self-reported data on both the predicting variables in this study (technological, relational and learning capabilities) and the criterion variable (the SMEs performance) may potentially be affected by the common method bias. Nevertheless, Podsakoff, MacKenzie, Lee, and Podsakoff (2003) established that the effect of CMV/bias can be minimize or completely eliminated through some statistical and procedural techniques. Therefore, to minimize the effect of CMV in this study both the procedural and statistical approaches were employed. Precisely, as part of the procedural, the study ensures the elimination of ambiguity in wording through pretest on five top managers of SMEs, guaranteed the anonymity of the respondents (Chang, Van Witteloostuijn, & Eden, 2010; Podsakoff *et al.*, 2003). On the other hand, using the Harman's single-factor test, all the measurement items of the variables under study were subjected to one principal component factor analysis to statistically evaluate the potential effect of CMV. The analysis of the result indicates eight factors, which jointly explained 78 percent of the entire variance, with the strongest predictor accounting for 25.964 percent which is substantially below the 50 percent (Kumar, 2012), hence no single factor explained majority variance (50 percent) (MacKenzie & Podsakoff, 2012; Kumar, 2012). Therefore, potential problem of CMV was not an issue to the reliability of the data in this study.

4. Results

4.1 Measurement model

Confirmatory analyses of the data related to each variable were performed using the partial least square structural equation model (PLS-SEM) to determine the reliability and validity of the data. Table I and Figure 1 indicate acceptable values for both the Cronbach's α and the composite reliability. Specifically, all the variables have Cronbach's α value higher than the acceptable 0.6 (Hair, Tomas, Ringle, & Sarstedt, 2017). Similarly, the requirements for

the composite reliability of 0.70 of all the variables have been established. The table also reveals that the value of the average variance extracted from each variable is greater than the acceptable threshold 0.50 for convergent validity (Hair, Black, Babin, & Anderson, 2010).

Accordingly, to ensure that each variable represents distinct phenomenon, Fornell & Larcker (1981) criterion is used to evaluate the discriminant validity of the variables under study. As shown in Table II, the value of each pair of the construct is greater than the value of the square correlations between the pairs of constructs; consequently, the discriminant validity and convergent validity were established.

4.2 Structural model

Latent variable techniques of PLS-SEM were employed to evaluate the hypotheses developed in this study. To assess the significant relationship hypothesized in the study, both the direct relationship of the independent variables with the mediating and the dependent variable were examined. Equally, the indirect relationship of the independent variable and the dependent variable through mediating variable were tested. The direct structural relationships were reported in Table III and Figure 2. The result indicates that technological capability positively and considerably relates to SMEs performance ($\beta = 0.603$; $t = 8.043$; $p = 0.000$), thus $H1$ is supported. However, $H2$ was not supported,

Variables	Cronbach's α	rho_A	Composite reliability	Average variance extracted (AVE)
LCAP	0.927	0.942	0.945	0.774
PERF	0.931	0.931	0.948	0.786
RCAP	0.922	0.941	0.930	0.660
TCAP	0.930	0.943	0.942	0.669

Table I. Reliability and convergent validity test

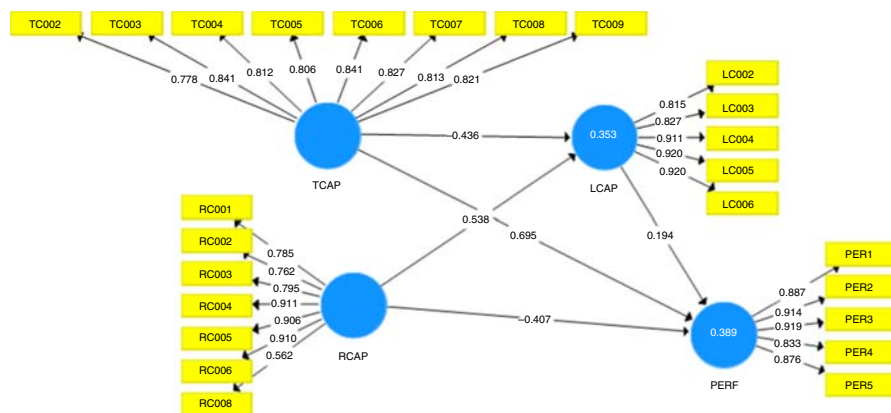


Figure 1. PLS algorithm

Variable	LCAP	PERF	RCAP	TCAP
LCAP	0.880			
PERF	-0.179	0.886		
RCAP	0.420	-0.138	0.813	
TCAP	-0.291	0.529	0.270	0.818

Table II. Discriminant validity

as the result indicates a significant negative relationship of relational capability with SMEs performance ($\beta = -0.297$; $t = 4.251$; $p = 0.000$). Similarly, technological capability negatively relates to SMEs learning capability ($\beta = -0.437$; $t = 8.170$; $p = 0.000$). On the other hand, relational capability positively and significantly relates to SMEs learning capability ($\beta = 0.546$; $t = 8.332$; $p = 0.000$), therefore, *H4* was supported. Equally, *H5* was supported as the statistical result reveals a significant positive relationship between learning capability and SMEs performance ($\beta = 0.603$; $t = 8.043$; $p = 0.000$). Collectively, technological and relational capabilities explain 35 percent changes (R^2) in SMEs learning capability, while technological, relational and learning capabilities collectively account for 39 percent of changes in SMEs performance (see Figure 1).

4.3 Mediating role of learning capability

In this section, the last hypotheses were tested. Specifically, *H7a* which states that learning capability mediates the relationship between technological capability and SMEs performance was tested. The empirical result in Table IV revealed that learning capability does not mediate the relationship between technological capability and SMEs

Paths	Original sample	Sample mean (<i>M</i>)	SD	<i>t</i> -statistics	<i>p</i> -values
LCAP → PERF	0.194	0.202	0.060	3.215	0.001***
RCAP → LCAP	0.538	0.546	0.065	8.332	0.000***
RCAP → PERF	-0.303	-0.297	0.071	4.251	0.000***
TCAP → LCAP	-0.436	-0.437	0.053	8.170	0.000***
TCAP → PERF	0.610	0.603	0.076	8.046	0.000***

Table III.
Direct relationship

Notes: TCAP, technological capability; RCAP, relational capability; LCAP, learning capability; PERF, performance. ***Significant at 0.01

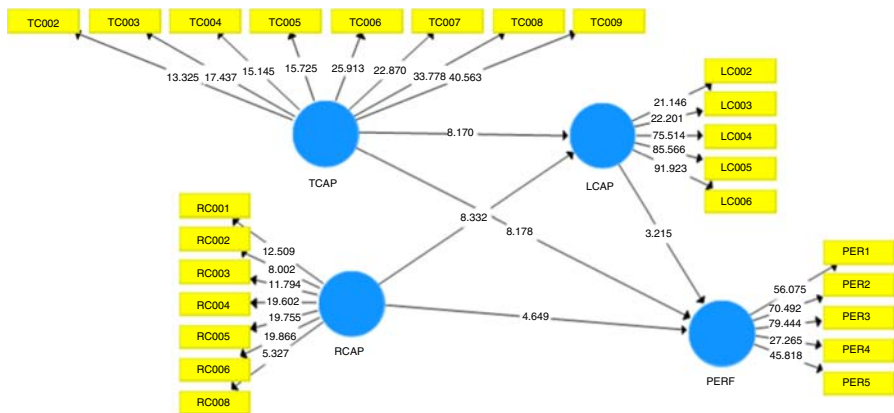


Figure 2.
PLS bootstrapping

Paths	Original sample	Sample mean (<i>M</i>)	SD	<i>t</i> -statistics	<i>p</i> -values
RCAP → LCAP → PERF	0.104	0.111	0.038	2.746	0.003***
TCAP → LCAP → PERF	-0.084	-0.089	0.031	2.709	0.003***

Note: ***Significant at 0.01

Table IV.
The indirect relationship

performance ($\beta = -0.089$; $t = 2.709$; $p = 0.003$), thus *H7a* was not supported. However, *H7b* was supported ($\beta = 0.111$; $t = 2.746$; $p = 0.003$), which means that learning capability mediates the relationship between relational capability and SMEs performance. The result indicates the significant role of learning capability in influencing the negative relationship of SMEs relational capability and performance to significant positive relationship. Thus, learning capability can be described as a strategic capability that helps SMEs acquire, assimilate and transform the external information and knowledge from strategic partners to enhance competitive advantage and performance.

4.4 Effect Size (F^2)

Effect size indicates the influence of the independent variable on the dependent variable due to the changes in the statistical value of R^2 . Otherwise f^2 shows the variance between R^2_{included} and R^2_{excluded} . Cohen (1988) established that a statistical value of 0.02, 0.15 and 0.35 designates small, medium and large effect size, respectively. Table V demonstrated a small, substantial and medium effect size of learning capability, technological capability and relational capability on SMEs performance, respectively, based on Cohen (1988) criterion. Accordingly, Table VI shows a substantial effect size for both technological capability and relational capability on SMEs learning capability.

4.5 Predictive relevance (Q^2)

Stone–Geisser or predictive relevance evaluates the predictive relevance of the model (Geisser, 1974; Stone, 1974). Blindfolding is the most commonly used techniques to evaluate the Q^2 . This technique compliments the goodness of fit in PLS–SEM (Hair *et al.*, 2013). Obviously, each particular dependent variable with Q^2 value greater than 0 represents its predictive relevance to the specific construct (Hair *et al.*, 2017). However, Hair *et al.* (2013) opined that a Q^2 value of 0.02, 0.15 and 0.35 signify weak, moderate and strong predictive relevance, respectively. Therefore, from Table VII, it can be clearly observed that both learning capability and SMEs performance have exhibited moderate predictive relevance.

Variables	PERF	Decision based on Cohen (1988)
LCAP	0.040	Small
TCAP	576	Substantial
RCAP	0.178	Moderate

Table V.
Effects size F^2 on performance

Variables	LCAP	Decision based on Cohen (1988)
TCAP	0.272	Substantial
RCAP	0.415	Substantial

Table VI.
Effects size F^2 on learning capability

Variables	SSO	SSE	$Q^2 = 1 - (SSE/SSO)$	Decision
LCAP	1,145.000	856.224	0.252	Moderate
PERF	1,145.000	818.771	0.285	Moderate
RCAP	1,603.000	1,603.000		
TCAP	1,832.000	1,832.000		

Table VII.
Predicting relevance Q^2 (Stone–Geisser’s)

5. Discussion

The study examined both the direct relationship of technological and relational capabilities with SMEs performance and the indirect relationship through the role of learning capability. The statistical result shows that technological capability is strategic SMEs capability, which significantly improves performance in today's dynamic and competitive market environment. This confirmed the findings of previous studies (Alegre & Chiva, 2009; Bergek *et al.*, 2008). Furthermore, the result indicated a significant positive effect of learning capability on SMEs performance. This demonstrated the VRIN nature and dynamic capability of SMEs learning capability in enhancing operation, competitiveness and performance in a rapidly changing competitive environment as confirmed by several other previous studies (Muddaha, Kheng, & Sulaiman, 2018; Visser, 2016; Goh *et al.*, 2012). Therefore, SMEs' ability to accurately predict and adjust to technological changes, making sufficient investment in research and development, plays a significant role in acquiring, operating and upgrading technological skills, which ultimately improve performance. Similarly, efficient experimentations, dialogues, risk taking, external integration and participative decision making enable SMEs improve profitability, expand market, enhance customer and employees satisfaction and create better environmental and social responsiveness. Equally, relational capability was found to be significantly and positively impacted on SMEs learning capability. This means that relational capability is also a VRIN resources and dynamic capability, which help SMEs firms develop effective collaboration with strategic partners to enhance other operational capabilities and improve performance in today's dynamic environment.

However, technological capability was found to be negatively related to SMEs learning capability; contrary to the views of previous studies (Zawislak *et al.*, 2013; Ray, 2008). Nevertheless, both technological capability and learning capability are contextually sensitive. Therefore, the negative relationship may be as a result of some imbalance in the operating and supportive environment of the SMEs in the study area. Previous studies hold that technological capability increases firm's efficiencies in developing innovative idea and knowledge from substantial investment in R&D, continuous training and applying innovative technology to problem solving process, which enable SMEs firms to achieve distinctive performance in reaction to the changing marketing environment (Mori *et al.*, 2016). Hence, SMEs firms in Nigeria may have demonstrated inadequate commitment to be technological pioneers, R&D and application of new technology in problem solving processes, which led to the diminishing experimentations, risk taking, dialogues and participative decision makings. Similarly, relational capability in this study was found to be negatively related to SMEs performance. This, however, does not mean relational capability is not a vital resource; it only implies that relational capability in some cases require other firm's resources, strategies or operational capabilities to effectively translate into higher performance. In this study, relational was established to impact positively on performance through learning capability. Nevertheless, the extant literature recognized the influence of other environmental factors in enhancing the effectiveness of firm's relationship with strategic partners. Rungsithong *et al.*, (2017) postulated that trust expedites the efficacy of relational capability in creating beneficial outcomes. Therefore, this negative relationship shows that SMEs in Nigeria may have exhibited limited trust in their relationship with external partners such as competitors, supplier, etc. in order to improve the attainment of better performance due to the fear of loss of control.

Another possible reason of this negative relationship may be the ineffectiveness of the Nigerian manufacturing SMEs to integrate and exploit the external resources to enhance the existing strength. Driving benefits from inter-firms relationship is a function of firm's integrative capacity (Rafique, Hameed, & Agha, 2018). Equally, weak firm hardly benefits from external relationship (Mavondo & Matanda, 2015). Thus, SMEs firms in Nigeria may

have been experiencing less competitive advantage in relationship with major competitors, who are out to maximize their market shares. Excessive relationship exposed firms to lose its competitive capabilities, knowledge and resources to major competitors (Ritala, Hallikas, & Sissonen, 2008). Recently, the Nigerian Government failed to assent the bilateral African continental free trade agreement due to pressure from Nigerian Labor Congress and the Manufacturers Association of Nigeria, that the treaty would be disadvantageous to Nigerian firms which are mainly SMEs due to the lack of economic of scale and competitive advantage (Akeyewale, 2018).

However, relational capability as VRIN and dynamic capability efficiently influence firm performance with effective complementary capability (Mavondo & Matanda, 2015; Jansen, Van Den Bosch, & Volberda, 2005). This was demonstrated by the statistical outcomes of this study which shows a significant positive impact of relational capability on performance through learning capability. This supports the argument of the extant literature (Yang *et al.*, 2018; Rungsithong *et al.*, 2017) which maintained that relational capability in some cases is effective in enhancing performance with supportive capabilities. Consequently, the mediating role of learning capability on the relationship of relational capability and SMEs performance was established by the finding of this study. However, learning capability does not mediate the relationship of technological capability and SMEs performance. This means that experimentations, risk taking, dialogues, external interaction and participative decision making in Nigeria SMEs do not get the required support of substantial investment in R&D, continuous training and applying innovative technology to problem solving process to enhance performance.

5.1 Implications

This empirical study provides both managerial and theoretical contributions. Theoretically, based on RBV and dynamic capability theory, it offers some valuable explanation on the role of technological capability and relational capability in improving SMEs competitive advantage and performance. Although both theories considered capabilities as essential resources, they differ on the timing and place of deployment. The RBV considers capabilities as resources which determine what markets to enter and how to stand. However, unlike the RBV, the dynamic capability view considers the ability of business firm's to reconfigure capabilities; adjust and survive in changing operating business environment. Hence, through deployment of valuable resources and dynamic capabilities, such as technological, relational and learning capabilities, SME firms achieve distinctive competitive position in the market. This underscored the postulation of the proponents of RBV (Barney, 1991; Wernerfelt, 1984). Accordingly, technological, learning and relational capabilities are dynamic capabilities that enable SMEs to adequately adjust to changing operating environment. David Teece and Pisano (1994) demonstrated that a firm drives sustainable competitive advantage through effective reconfiguration capabilities that suit changing environment. Therefore, this study contributes to the body of existing knowledge by postulating technological, relational and learning capabilities as strategic VRIN resources that help SMEs to create distinctive competitive position in the market. It also advances the roles of these capabilities as dynamic capabilities which enabled SMEs achieve sustainable improved performance in changing environment. Furthermore, the study contributes theoretically, by testing the mediating role of learning capability on relationship between technological capability and performance as suggested by Wang *et al.* (2006) and relational capability and performance sought by Sukoco *et al.* (2018).

Practically, managers of SMEs firms in developing economy must recognize and appreciate the potential role of technological, relational and learning capabilities in achieving sustainable superior performance in this competitive and dynamic changing environment. The dynamic operating environment entails that SMEs firms must work with

not only business partners, but also collaborate with all strategic relevant public and private organizations to draw external information and resources to improve competitive position and performance. Through relational capability, SMEs can develop efficient collaborative relationship to acquire new resource, techniques and knowledge. This is specifically essential for SMEs firms from less developed economies as they are lagging behind on the global competitive platform, and that the possession of specific advantage locally may not be adequately enough to help penetrate the global markets. Therefore, SMEs in Nigeria must revisit their commitments in developing relational capability which can facilitate the establishment of effective collaboration with strategic partners.

Similarly, technological capability enables firms to identify acquire and apply new external knowledge to develop operational competencies that lead to the attainment of superior performance. Through effective technological capability, firms create and deliver new products and services in better and efficient way that best satisfy the customer needs, thus determines the overall success of the firm's new product development and performance. Technological capability enables SMEs firms to endure the effects of dynamically changing business environment throughout the life of the business. However, SMEs in Nigeria must adjust their strategic technological planning to ensure substantial investment in R&D, continuous training and applying innovative technology to problem solving process that improves learning to enhance performance. Learning capability has been established as crucial resource that supports SMEs firm in improving productivity, sensing market opportunities, adjusting business activities, minimizing cost and improving new product delivery methods in the market. It facilitates the potentials of SMEs firm to survive, innovate and flourish in the market. Thus, SMEs that successfully develop and continuously advance their ability in learning create superior competitive advantage.

5.2 Limitation of the study

This research aimed to evaluate the impacts of technological, relational and learning capabilities on the performance of SMEs in developing economies of Africa. The study hypothesized that technological capability, relational capability and learning capability positively associated with SMEs performance. Although, the finding of this study provided a support for most of the hypotheses, however, the hypothesized direct relationship of SMEs relational capability and performance was not established. Similarly, no significant positive relationship of technological capability and SMEs learning capability was reported. Nevertheless, these capabilities have demonstrated to be contextually sensitive, thus other environmental and operational factors may have influenced their relationship with SMEs performance. Consequently, the stream of future studies should consider replication of this study in different cultural environment, and consider the potential role of other firm's strategies, orientation and capabilities such as marketing, absorptive, innovation and management practice. Equally, data used in this study were cross-sectional, so further study should consider longitudinal data. Although the effects of common method bias were not significant in this study, employing multiple sources to collect data may provide a substantial insightful data related to the relationship of these variables under study.

5.3 Conclusion

The meticulous findings of this study offered managerial contribution for SMEs in Nigeria and developing economies that are compelling to invest in developing technological, relational and learning capabilities to advance their operating technologies for better competitiveness and performance. It is a well-established fact that no business can operate efficiently in this globalized business environment without modern technologies and collaborations with strategic partners. Hence, SMEs managers in Nigeria must re-strategize their relational capability to ensure that it effectively helps to develop collaboration that

brings beneficial resources for better performance. Additionally, SMEs managers in Nigeria must revisit their strategic planning in technological development to foster their commitment that supports learning by allocating sufficient resources and qualified technicians to embrace experimentation, risk taking, dialogues, interaction and participatory activities. Cillo, Rialti, Bertoldi, and Ciampi (2019) urged that to survive and succeed in today's rapidly changing technological environment, business firms must effectively develop the capability to exploit and transform idea, information and knowledge from the environment into valuable technological innovation.

Therefore, based on the RBV and DCT perspectives, SMEs firms through technological, relational and learning capabilities can excellently identify, acquire, transform and share idea, information and knowledge that can help enhance business performance and societal consideration. Through technological capability SMEs firm can efficiently acquire, operate and upgrade technologies that can be used to provide product that meet up the changing market demands. Equally, relational capability through learning capability is crucial in achieving and sustaining superior SMEs performance in this global competitive business environment. Accordingly, government policies and programs designed to support technological development and innovation must be adjusted to consider the peculiar nature of SMEs firms in terms of technology and innovativeness that enhance competitive position and performance. This is essential for SMEs in developing economies that are constrained by a chain of insufficient human capital, inefficient technological, collaborative and innovative capabilities.

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S. No.

Technological capability

- 1 Our company is one of those firms in the industry that establish technology standard
- 2 Our company is one of those firms in our industry to upgrade technology standard
- 3 Our company has superior competitive technology strategy in the industry
- 4 Our company has robust technological skills in several fields of operation
- 5 Our company leads in technology innovation in the industry we operate
- 6 Our company is competent in applying innovative technology to problem solving
- 7 Our company has the monitoring capacity to accurately predict changes in the technological environment
- 8 Our company has strong abilities to integrate internal and external technological resources
- 9 Our firm has the capacity to attract and hire talented experts
- 10 Our company makes sufficient investment in R&D activities
- 11 Our company improves technical skills through continuous training programs

Learning capability

- 1 Our company has been encouraging knowledge sharing among employees
- 2 Our company encourages participatory decision making
- 3 Our company's management is committed to effective learning
- 4 Our company is committed to internal dialogue
- 5 Our company encourages experimentation and openness
- 6 Our company always strive toward knowledge transfer
- 7 Our company supports new idea from employees

Relational capability

- 1 Our company has the ability to create relationship with new relevant partners
- 2 Our company has the ability to maintain relationship with existing partners
- 3 Our company has the capability to develop mutual trust with strategic partners
- 4 Our company has the capacity to develop mutual goals and commitment with strategic partners
- 5 Our company has the ability to build on the strength of our strategic partners
- 6 Our company has develop the ability to effectively communicate with relevant partners
- 7 Our company has the capacity to engage with partners collectively in problem solving
- 8 Our company has the capacity to achieve target while negotiating with relevant partners
- 9 Our company has the capability to achieve win-win with relevant partners

SMEs performance

- 1 Over the past 3 years, our company has been recording success
- 2 Our company's profit has improved over the past few years
- 3 Over the past 3 years, our employee's satisfactions have improved
- 4 Over the past 3 years, our customer's satisfactions have improved
- 5 Over the last 3 years, our company's social performance has improve significantly
- 6 Over the past 3 years, our company's performance in environmental protection has improved

Table AI.
Measurement

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