Impact of Knowledge and Network Ties on the Performance of Micro and Small Technical Enterprises in Southwestern Nigeria

Emmanuel Makanjuola OGUNJEMILUA*; Titilayo Olubunmi OLAPOSI; Mathew Olugbenga ILORI

Abstract

The study examined the knowledge areas of operators of micro and small technical enterprises (MSTEs) in Southwestern Nigeria. It investigated the extents and depth of operators' collaborations and evaluated the influence of operators' knowledge and network ties on their performance. The study covered technical entrepreneurs in southwestern Nigeria. Data were collected from primary and secondary sources. Multi-stage sampling technique was used for the study. Data collected were analysed using descriptive and inferential statistics. Results showed that comprehensiveness of knowledge areas and forms of collaborations significantly (p-value <10%) influenced performance measures; profit, sales and staff strength. The study concluded that improved knowledge of the operators of MSTEs and effective collaboration among them could lead to significant improvement of their performance.

Keywords: Knowledge, Network Ties, and Performance.

INTRODUCTION

Small scale business started gaining prominence in Nigeria in the early 1970s and many personal enterprises started springing up and served as a catalyst in the socio–economic development of economy (Osotimehin et al.,

---

* **African Institute for Science Policy and Innovation** Emails: makanjuola19@gmail.com*, **Obafemi Awolowo University, Ile-Ife, Nigeria** olapositi@gmail.com, milori@oauife.edu.ng *+2348156938474*

2012). Moreover, the importance of micro, small and medium enterprises in the growth process is considered to be a key engine of economic growth and development in Nigeria (NMSMECS, 2010). Uzor (2004) opined that micro and small scale enterprises (MSEs) contribute to national development by positively influencing the distribution of income both in functional terms, wages and profits in nominal terms. Hence, Micro and small technical enterprises (MSTEs) are drivers of economic growth.

With the realization of the potentials of the MSEs, governments at different level in Nigeria have put up a lot of support programmes to promote and sustain their development through increased incentive schemes including enhanced budgetary allocation for technical assistance programmes, the establishment of research institutes and technology incubation centres (TICs), the Small and Medium Enterprise Development Agency of Nigeria (SMEDAN), National Directorate for Employment (NDE) are some of the means through which the government of Nigeria uses to encourage entrepreneurship development (Osotimehin et al., 2012).

Despite government intervention, micro and small scale enterprises (MSEs) in Nigeria have not performed creditably well and they have not played expected significant role in economic growth and development. The abysmal performance of this sector has been of great concern to government, citizen, practitioners and organized private sectors in Nigeria. Hence, this study aimed to investigate the impact of operators' knowledge areas and collaborations on their performance. The findings of this study will be useful to policy makers in providing appropriate intervention that will bring about improved micro and small technical enterprises' performance in developing countries.

This paper follow as introduction, review of literature, methodology, results, results and discussion and references.

REVIEW OF LITERATURE

Knowledge and Knowledge Management

Knowledge is the theoretical and practical understanding of information acquired through learning or experience. All knowledge is generated in the human head and shaped by the cultural and physical context of the time

(Campbell, 2006). Fenstermacher (1995) asserts that practical knowledge consists in some part of what epistemologists call performance knowledge which otherwise refers to as "knowing how", though it ranges well beyond this limited notion of performance or competence, it is strategic knowledge.

There are two types of knowledge base; analytical (science-based) and synthetic (engineering-based) (Asheim and Coenen, 2005). An analytical knowledge base refers to industries where scientific knowledge is highly important, and where knowledge creation is often based on cognitive and abstract. The intellectual challenge is to understanding natural systems by discovery and application of natural laws where the knowledge often equals the product. A synthetic knowledge base refers to industries where innovation takes place mainly through the application of knowledge or through recombination of existing knowledge in new ways.

In this competitive world, knowledge is the most powerful engine of production (Rahmani and Iran, 2010). Hence, Sullivan and Marvel (2011) note that during early stage of venture development, knowledge is especially critical. This is because early-stage ventures are plagued by resource deficiencies and liabilities of newness that increase the risk and uncertainty associated with the ventures (Wu et al., 2008). In addition, Grant (1996) asserted that knowledge is indispensable resource for new ventures. Knowledge is strategically important resource that can form the basis for a new venture's competitive advantage. Likewise, Kogut and Zander (1992) asserted that knowledge is a primary resource for achieving favorable entrepreneurial outcomes because privately held knowledge (tacit knowledge) is a basic source of advantage in competition. This is because knowledge enhances an entrepreneur's ability to exploit opportunities in the market areas. In addition, acquisition of relevant knowledge is advantageous to new venture development and a resource contributing to a competitive advantage (Sullivan and Marvel, 2011). Hence, the more knowledge individuals possess the better able they are to identify entrepreneurial opportunities and achieve higher level of efficiency when completing job related tasks, and develop solutions to challenges that are encountered (Yu, 2001).

Knowledge can help entrepreneurs to be certain about its business environment. (Chrisman et al., 2005). In early venture development,

knowledge is the first type of resource that any new start-up possesses and it is the foundation for a new venture's early survival and longer-term sustainability (West and Noel, 2009). The more knowledge entrepreneurs have of varying business areas like sales, finance, marketing, human resources etc., the more prepared they are to overcome challenges with early-stage operations, which should enhance venture development and subsequent resource accumulation efforts (Sullivan and Marvel, 2011). In the same vein, Chrisman et al. (2005) reported that entrepreneurs who spent time obtaining knowledge through Small Business Development Centre (SBDC) reported higher revenues and more employees five to nine years after venture lunch than entrepreneurs who spent less time.

Entrepreneur's knowledge serves as an impetus for making a sound choice that will allow freedom of expression and greater permission for personal and professional growth. Apparently, two things are involved simultaneously: propensity to start an entrepreneurial venture and skills to run the venture successfully (Udaejah, 2006). Hence, operating entrepreneurship ventures successfully entails frugality; this is by keeping overhead cost low and productivity high, they ensure that costs are drastically reduced (Wood, 2005). This is due to entrepreneurial knowledge. Sullivan and Marvel (2011) note that knowledge held by a particular person enables that person to be more effective. If people interact to share their knowledge within a community of practice, then that practice becomes more effective.

Network Ties

Network ties refer to the inter-personal interactions that make up social life (Lyon, 2000). Network ties are persons with whom entrepreneur is in contact with and that are helpful to the entrepreneur for various business purposes (Greve and Salaff, 2003). Hence, Sullivan and Marvel (2011) opines that network ties refer to individuals an entrepreneur is in contact with for business-relevant purposes. 'Ties' rather than 'contacts' are the basis of collaboration and any individual's set of relationships can be classified as strong or weak (Aldrich *et al.*, 1997). In addition, Entrepreneurs build successful business by maximizing the opportunities and social networks that are crucial for their business (Rothwell and Dodgson, 1991). The personal networks created by entrepreneurs fulfill a number of roles including the

provision of social support, extending strategic competences by identifying threats and opportunities and supplementing internal resources to resolve particular problems (Shaw and Conway, 2000).

Anderson (2008) defines collaboration as strategic mode of integration in which two or more organizations co-operate on parts or all stages of production from the initial phase of research to marketing and distribution phase. The rationale behind collaborations can vary; getting access to market, increasing efficiency, getting access to new competencies, and the sharing of risks as potential drivers for collaboration. Furthermore, Arku (2002) mentions that one of the largest reasons for smaller companies to collaborate is to get access to technological knowhow or to specialize skills, while the main larger companies may collaborate to penetrate new geographical markets. Firms can enter into a wide variety of external relationships with suppliers, customers, accountants, solicitors, banks, trade associations and business support agencies (Curran *et al.,* 1995). Lyon (2000) note those links which are essentially transaction based may be considered value added network links if, for example, the firm receives market information from customers. Rahmani and Iran, (2010) note that common way for people to accessing useful information about business opportunities is through their network ties. Borgatti and Forster (2003) assert that the two commonly studied network ties characteristics include the number of ties with whom the entrepreneur is connected with and the relative benefits of the network ties. Birley et al., (1990) notes that entrepreneurs at an early stage of enterprise development, rely heavily on informal network of friends, family members and social contacts from the local neighbourhood to gather relevant data. Gradually, entrepreneurs networks is being extended to bankers, accountants, lawyers, suppliers, government agencies, customers and consultants because of its benefits (McGhee et al., 1995). Entrepreneurs with good cultural and collaboration attract more capital and are more likely to be successful than those with limited connections (Shaw, 1998).

There are two forms of network ties: knowledge and business networks. These are formed by differing underlying motivations which make it reasonable to believe that their structural characteristics differ widely (Elisa, 2006). In addition, Giuliani and Bell (2005) assert that when a cluster is populated almost exclusively by firms with particularly weak knowledge

bases, which have poor capabilities to both transfer and absorb knowledge, there is a high chance that the intra-cluster knowledge network will be poorly connected. Firms with weak knowledge bases will have at best a least marginal position in the knowledge network, because they neither offer anything of value to other firms nor have the internal capacity to absorb external knowledge (Elisa, 2006). Business networks are "integrated and co-ordinated set of ongoing economic and non-economic relations embedded within, among and outside business firms" (Keeble and Wilkinson, 1999). The formation of business networks is based on the co-existence of market, social and institutional relationships, which occur almost routinely in a cluster context (Elisa, 2006). Business network is more likely to be shaped by pervasive and unplanned local interactions because professionals or entrepreneurs who work within the same cluster meet by chance and interact on issues related to their jobs, from market transactions to other informal professional interactions (Malmberg, 2003). Obviously, business networks may be channels for the transfer of several assets, among which are knowledge and information (Malmberg, 2003).

In terms of the composition of network ties, Johannisson (1999) identifies three essentially interdependent forms. These are *information networks* which provide business intelligence, *exchange networks* which provide operational resources and *influence networks* which also carry information but tend to operate in the main as barriers for potential competitors. Therefore, the components of social capital; social interactions, relationship quality, and external ties, benefit ventures to receive resources and knowledge, to reduce the transaction cost between organizations, and to have positive influences on performance (Chen *et al.,* 2007). In addition, Borgatti and Foster (2003) proposed that entrepreneurs who are able to gain what they need through their network relationships are viewed as successful. These needs could be in form of knowledge regarding new technologies, financial assistance capabilities and networks that have high compositional quality of such will lead to more desirable outcomes (Hite and Hesterly, 2001). In addition, Baum *et al.* (2000) posit that a more efficiently diverse network in terms of knowledge, capabilities will provide optimal firm performance benefits because resources are not wasted on redundant contacts.

METHODOLOGY

The study was carried out in four selected states in Southwestern Nigeria namely Lagos, Ekiti, Oyo and Ondo. Primary data were collected using one set of questionnaire and supplemented with guided interview. Three Local Governments were randomly selected from each of the states. Purposive-Random technique was used to administer the questionnaire on twenty five micro and small technical enterprises in each Local Government Area making a total of three hundred respondents but two hundred and forty nine were retrieved and used for this study. The criteria for purposive sample selection are (i) the firm must be a technical enterprise, (ii) it must have been established for at least two years before the study was conducted. Likewise, the criterion for random sampling was that both males and females technical entrepreneurs in the study areas were given equal chances of being selected for the study in Southwestern Nigeria (gender consideration). Pilot survey was conducted in Osun State using thirty copies of questionnaire in order to improve on the effectiveness of the study design. Data collected from technical entrepreneurs were analyzed using both descriptive statistics such as frequency, percentage, mean and standard deviation, and inferential statistics such as multinomial logistic regression. The justification for using multinomial logistic regression is because both the factor and response variables for this study were categorical. And multinomial logistics regression measures the relationship between non-metric and metric or dichotomous variables. *It also compares multiple groups through a combination of binary logistic regressions*. An alpha level of 0.1 was chosen *a priori* as the level of significance which is 90% confidence interval (CI). Methodology of Sullivan and Marvel (2011) was adapted to measure the comprehensiveness of business-related knowledge of the technical entrepreneurs. The business-related knowledge areas represent a reasonably comprehensive list of business functional areas for which at least some knowledge would be needed to successfully start most businesses (Smith, Collins and Clark, 2005).The respondents indicated their expertise across 11 business-related knowledge areas such as Accounting, Finance, Legal, Engineering/research, General management, Human Resources, Technology, Manufacturing/Production, Marketing /distribution, Sales (Customer origination), Service (Customer support). The relative comprehensiveness of founder expertise

was calculated as the ratio of expertise areas for which respondents indicated they possessed expertise to total possible knowledge areas. Numbers closer to one (+1) indicate a more comprehensive knowledge set, if otherwise closer to zero (0), it indicate a less comprehensive knowledge set. Hence, this ratio measurement was supplemented with five point Likert scales; very low was assigned for 1–2 knowledge areas while very high was assigned for 9 – 11 knowledge areas. To determine the extents and depth of operators' collaborations, respondents were asked to indicate if they have collaboration with people of related business, how the collaboration started, and the number of collaborations that benefit the business, forms/types and benefits of collaborations. The forms/types of business collaboration were indicated in three phases: first, formal forms of collaboration only such as collaboration with government organization, collaboration with suppliers, collaboration with social organization/ clubs, collaboration with recruiting firms, collaboration with research institute (s). Second, informal forms of collaboration only involved collaboration with customers, collaboration with relative and friends, collaboration with competitors. Third, both formal and informal forms of collaboration. On the benefits of collaborations, respondents ranked the degree of their support on a five point Likert scales of 1 for indifference, 2 for strongly disagreed … and 5 for strongly agreed. Multinomial logistic regression was computed with the help of Statistical Package for Social Sciences (SPSS 20) to test the impact of knowledge and network ties on the performance of micro and small technical enterprises in Southwestern Nigeria. The performance of technical entrepreneurs variables were measured subjectively. This was due to the fact that most of the respondents were not willing to reveal their profit and sales volume explicitly (Tax avoidance strategy) and to be consistent (reliability) in measuring performance. Profit and sales volume were measured using 4 point scale of 1 for very low and 4 for very high, while staff strength was measured with the present number of full time employees as compared to at least two years ago of operation such as 1 for no increase in staff strength, 2 for fluctuation in staff strength, 3 for decrease in staff strength and 4 for increase in staff strength. The performance measures use for this study are both input (staff strength) and output (sales and profit) measures.

Model specifications for impact of knowledge and network ties on the performance of technical enterprises in Southwestern Nigeria (TE).

The multinomial logistic regression for this study is;

Logit $\{Y\} = \{F(X)\} + E \equiv$ Logit $\{Y=1 \text{ vs.} 0\} = \beta_0 + \{\beta_1 X1\} + \{\beta_2 X_2\} + E$
Where $Y_{1-3} =$ Performance, and $X = X_1, X_2$

Performance $= F$ (Forms of collaborations and comprehensiveness of business-related knowledge)

Logit $\{Y=1 \text{ vs.} 0\} = \beta 0 + \{\beta_1 X_1\} + \{\beta_2 X_2\} + E$
Logit $\{Y1=1 \text{ vs.} 0\} = \beta 0 + \{\beta_1 X_1\} + \{\beta_2 X_2\} + E$……………………………(i)
Logit $\{Y_2=1 \text{ vs.} 0\} = \beta_0 + \{\beta_1 X_1\} + \{\beta_2 X_2\} + E$…………………………(ii)
Logit $\{Y_3=1 \text{ vs.} 0\} = \beta_0 + \{\beta_1 X_1\} + \{\beta_2 X_2\} + E$…………………………(iii)

Performance $=$ (profit, sales volume and staff strength)

$X_1 =$ Forms of collaborations
$X_2 =$ Comprehensiveness of business-related knowledge
$\beta_0 =$ Constant
$\beta_{1,2} =$ Regression coefficients ranging from 1-2 (*Beta*)
E= Error term
$Y_1=$ Profit
$Y_2=$ Sales volume
$Y_3=$ Staff strength

RESULTS

In the survey of socio-demographic of technical entrepreneurs considered for this study, Table 1 shows that majority (78.7%) of the technical entrepreneurs were male while only 20.1 % were female and 2.1% did not define their gender. Table 1 further shows that majority (47.4%) of the technical entrepreneurs sampled were in the age group of 31 to 40 years. The Table further showed that about 73.9% of the respondents were married, and only 20.9% were single while 0.8% were divorced and 4.4% were recorded as no response.

Table 1: Socio-demographic characteristics of respondents

Parameters	Characteristics	Frequency	%
	Male	196	78.7
Gender	Female	50	20.1
	No response	3	1.2
	Total	**249**	**100**
	Under 21	1	0.4
	21-30	60	24.1
Age (Years)	31-40	118	47.4
	41 and above	64	25.7
	No response	6	2.4
	Total	**249**	**100**
	Married	184	73.9
	Single	52	20.9
	Divorced	2	0.8
	No response	11	4.4
	Total	**249**	**100**

Table 2 shows that majority (44.6%) of the respondents had Senior Secondary School Certificate as their highest educational qualification, followed by (20.1%) Primary School Leaving Certificate, about 17.3% had B.Sc./HND, and 8.8% had ND/NCE Certificate, 4.8% had Junior Secondary School Certificate and 0.8% had Post Graduate Degree as their highest educational qualification. Table 2 further shows that majority (57%) of the respondents' opening hour was 8 am which correspond to an adage that says "punctuality is the key to business", followed by 18.1% of the respondents that opened by 7 am while 4%, 1.6%, 6.8% opening hour were 6 am, 6.30 am and 7.30 am respectively. Probably, this proportion that opens between 6 am to 7 am had their business location at home, so it's possible for them to claim that they open early because they reside near their business location. Nevertheless, 3.2%, 9.2% and 3.6% opening hour were 8.30 am, 9 am, and 10am respectively. The table further shows the firms' operation years of the respective respondents. Majority (37%) of the respondents had 14 years and above of their firms in operation followed by 26.7% that had 5-8 operation

years of the firms. Moreover, 23.5% of the new venture considered had 1-4 years of firms operation while 12.8% of the established firms had 9-12 years of their firms in operation.

Table 2 Distribution of respondents by highest educational qualifications and

Characteristics	Frequency	%
Highest educational qualifications		
Primary School leaving Certificate	50	20.1
Junior Secondary School Certificate	12	4.8
Senior Secondary School Certificate	111	44.6
National Diploma/ National Certificate in Education	22	8.8
Bachelor of Science/ Higher National Diploma	43	17.3
Post Graduate Degree	2	0.8
No response	9	3.6
Total	**249**	**100**
Opening hour (GMT +1)		
6:00 am	1	0.4
6:30 am	4	1.6
7:00 am	45	18.1
7:30 am	17	6.8
8:00 am	142	57
8:30 am	8	3.2
9:00 am	23	9.2
10:00 am	9	3.6
Total	**249**	**100**
Years of establishment (Firms' age)		
New venture		
2-4 years	57	23.5
5-8 years	65	26.7
Established firm		
9-12 years	31	12.8
14 and above	90	37
Total	**249**	**100**

Table 3 shows that out of two hundred and forty nine technical entrepreneurs' respondents, about 0.8% specialized in food and beverages (e.g. meat processing), 14.5% specialized in textiles, clothing, garment and leather (leather shoe making, tailoring and upholstery). Majority (20.9%) of the respondent; specialized in wood and wood products (furniture, carpentry

and carving), followed by 13.7% that specialized in metal and aluminum fabrication. About 0.8% specialized in Publishing and printing, 3.6% specialized in Construction (builders and bricklayers), and 5.6% specialized in electrical and electronic equipment- electric control maintenance and installation. 4.4% specialized in block fabrication, 4.8% specialized in Graphic (Art design, Painting, Photography and video Production), 8.4% specialized in Salon (Hairdressing and Barbing), 4.8% specialized in farming- poultry and fishery, 9.6% specialized in automobile (Mechanic, Panel beating, Vulcanizing) and 7.6% specialized in others (Popcorn, Catering, and Dry cleaning).

Table 3 Distribution of respondents by specialties

Specialties	Frequency	%
1. Food and beverages (eg meat processing)	2	0.8
2. Textiles, clothing, garment and leather (Leather shoe making, upholstery and tailoring,)	36	14.5
3. Wood and wood products (Furniture and carpentry, and carving)	52	20.9
4. Publishing and printing	2	0.8
5. Metal and Aluminum Fabrication (welding)	34	13.7
6. Construction (build and bricks laying)	3.6	
7. Electrical and Electronic equipment (Electric control maintenance and installation)	14	5.6
8. Block fabrication	11	4.4
9. Graphic (Art Design, Painting, Photography and video Production)	12	4.8
10. Salon (Hairdressing and Barbing)	21	8.4
11. Farming (poultry and fishery)	12	4.8
12. Automobiles (Mechanic, Panel beating and vulcanizing)	24	9.6
13. Others (Popcorn, Catering and Dry cleaning)	19	7.6
14. No response	1	0.4
Total	**249**	**100**

Table 4 shows the distribution of respondents by the number of business-related knowledge which determines the comprehensiveness of their knowledge needed for successful business performance. The highest percentage (28.1%) had five knowledge areas out of eleven. The percentage (71.2%) that had 5 or less knowledge areas was greater than the percentage

(28.9%) that had 6 or more knowledge areas. The mean (4.80) of the number of knowledge areas and its standard deviation (1.702) shows the amount by which measurement in knowledge areas vary from the average. By implication, the distribution of business-related knowledge clustered around the mean. In categorizing the knowledge areas of the respondents, Table 4 further revealed that comprehensiveness of business related- knowledge areas of the majority (35.3% and 38.6%) of the respondents were low (3-4 knowledge areas) and average (5-6 knowledge areas) respectively while comprehensiveness of business related knowledge areas of other respondents (7.6%, 16.1% and 2.0%) were very low (1-2 knowledge areas), high (7-8 knowledge areas) and very high (9 – 11 knowledge areas) respectively.

Table 4 Distribution of respondents by number of business-related knowledge

Numbers of knowledge areas (out of 11)	Frequency	%	Mean	SD
1	1	0.4		
2	18	7.2		
3	41	16.5		
4	47	18.9	4.80	1.702
5	70	28.1		
6	26	10.4		
7	33	13.3		
8	7	2.8		
9	1	0.4		
10	4	1.6		
No response	1	0.4		
Total	**249**	**100**		
Comprehensiveness of business-related knowledge (out of 11 knowledge areas)				
Very low (1-2 knowledge areas)	19	7.6		
Low (3-4 knowledge areas)	88	35.3		
Average (5-6 knowledge areas)	96	38.6		
High (7-8 knowledge areas)	40	16.1		
Very high (9 – 11 knowledge areas)	5	2.0		
No response	1	0.4		
Total	**249**	**100**		

Table 5 shows that majority (88.4%) of the respondents collaborated with people of related businesses while minority (8.8%) of the respondents did not collaborate with people of related business. This might be because they perceived that collaboration is not-significant to their performance. Table 5 further shows that majority (66.6%) of the respondents started the collaboration because it's compulsory while 33.6% of the respondents started via special invitation by business related friend (s) and which was supported by their interest in the collaboration. Table 5 also revealed that out of 199 respondents, majority (159:64%) was involved in 3-5 collaborations while only (10: 4%) had six collaborations that were helpful to their business. The table shows that distribution of respondents by the number of collaboration that was helpful to their business had mean (3.69) and standard deviation (1.253) which means that the distribution of number of collaborations that were helpful to business clustered around the mean.

Table 5 Distribution of respondents by number of collaboration that were helpful to their businesses and how they started collaboration

Characteristics	Frequency	%	Mean	SD
Collaboration with people of related-business				
Yes	220	88.4		
No	22	8.8		
No response	7	2.8		
Total	**249**	**100**		
How they start collaboration				
Through special invitation by business related friend(s) and interest	74	33.6		
Its compulsory	146	66.4		
Total	**220**	**100**		
Number of collaborations that are helpful to business				
0	8	3.2		
1	1	0.4		
2	21	8.4		
3	37	14.9		
4	90	36.1	3.69	1.253
5	32	12.9		
6	10	4.0		
No response	48	19.3		
Total	**247**	**100**		

Table 6 shows the three phases of the respondents' collaborations. The majority (73.9%) of the respondents are connected to both formal and informal forms of collaboration. The table further shows the percentage of respondents that were connected with informal forms of collaboration only (12.9%) which entail collaboration with customers, competitors, relatives and friends and, formal forms of collaborations only (5.2%) which also entail collaboration with Government organization, top managers of their suppliers, social organization/clubs, recruiting firms and research institutes.

Table 6 Distribution of respondents by form of collaboration

Form of collaboration	Frequency	%
Both Formal and Informal collaboration	184	73.9
Formal collaboration only; (collaborations with Government organization, top managers of my supplies, social organization/clubs, recruiting firms and research institute)	13	5.2
Informal collaboration only; (collaboration with; customers My competitors, relative and friends)	32	12.9
Total	**229**	**92**

Table 7 shows the mean ranking of the respondents' perceptions of the benefits of collaboration. The Table shows that collaboration will provide access to information (4.23), collaboration leads to increase in sales (4.08), collaboration will ensure efficient utilization of resources (3.87), collaboration allows individual to work in any of their member's workshop freely (3.87), collaboration will strengthen bargaining power (3.82), collaboration will give access to required resources (3.76), number of collaboration a firm has will determine the level of its competitive strength (3.68) benefits the stakeholders. The aforementioned benefits of collaborations were significant on the respondents considered *(Likert scale measurements)*. While collaboration leads to lower opportunity cost (comparative advantage) (3.18), collaboration will increases financial capabilities (3.25), and collaboration creates barriers for new entrants (2.90) did not affect the respondents considered (*Likert scale measurement*).

Table 7 Distribution of mean rank of benefits of collaborations

Parameter of benefits of collaborations	Mean Rank
i. Collaboration will provide access to information	4.23
ii. Collaboration leads to increase in sales	4.08
iii. Collaboration will ensure efficient utilization of resources	3.87
iv. Collaboration allows individual to work in any of their members' workshop freely	3.87
v. Collaboration will strengthen bargaining power	3.82
vi. Collaboration will give access to required resources	3.76
vii. Number of collaboration a firm has will determine the level of its competitive strength	3.68
viii. Collaboration will increase financial capabilities	3.25
ix. Collaboration leads to lower opportunity cost (Comparative advantage)	3.18
x. Collaboration create barriers for new entrants	2.90

Source: Field Survey (2014)

1= Indifferent, 2= Strongly Disagree, 3 = Disagree, 4 = Agree, 5= Strongly Agree

Table 8a and 8b shows the multinomial logistic regression between forms of collaboration and comprehensiveness of business-related knowledge on profit which is one of the performance measures used for this study. Table 8a showed the importance of the association of factor variables independently on the response variable (profit). The table revealed that the association of forms of collaboration with profit of MSTEs was statistically significant ($X2= 11.313$, df = 6, p = 0.079), likewise, the comprehensiveness of business-related knowledge was statistically significant ($X2= 76.568$, df = 12, p = 0.000*) p= 10%. Furthermore, the result of the multinomial logistic regression for this model in Table 8b showed that the probability of the model chi-square (102.101) was 0.000*, i.e. the P-value < 0.05 for the model with degree of freedom of 18. This shows that the model explain a significant association between the factor variables and the response variable (profit). Put differently, impact of knowledge and network ties was statistically significant on the performance of micro and small technical enterprises in Southwestern Nigeria.

Table 8a Multinomial logistic regression of business related knowledge and collaborations on performance of MSTEs (profit)

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	43.820[a]	0.000	0	.
Forms of collaborations	55.132	11.313	6	0.079*
Comprehensiveness of business-related knowledge	120.388	76.568	12	0.000*

*Sig at P<10%

Table 8b Multinomial logistic regression of business related knowledge and collaborations on performance of MSTEs (profit)

Model	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	145.921			
Model of the two factors	43.820	102.820	18	0.000*

Table 9a and 9b shows the multinomial logistic regression of forms of collaboration and comprehensiveness of business-related knowledge on sales volume of the MSTEs in the study area. Table 9a showed the importance of the association of forms of collaboration and comprehensiveness of business-related knowledge (independently) on the sales volume of the respondents considered. The Table revealed that the association of forms of collaboration with sales volume of MSTEs was not statistically significant (X2= 8.792, df = 6, p = 0.186). Whereas, the association of the comprehensiveness of business-related knowledge with sales volume of MSTEs was statistically significant (X2= 67.582, df = 12, p = 0.000*) at 10% level of significant.

Table 9a Result of multinomial logistic regression of forms of collaborations and comprehensiveness of business-related knowledge on performance of MSTEs (sales volume)

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	53.783[a]	0.000	0	.
Forms of collaboration	62.575[b]	8.792	6	0.186
Comprehensiveness of business-related knowledge	121.365	67.582	12	0.000*

Sig at P<10%

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

b. Unexpected singularities in the Hessian matrix are encountered. This indicates that either some predictor variables should be excluded or some categories should be merged.

Table 9b Result of multinomial logistic regression of forms of collaborations and comprehensiveness of business-related knowledge on sales volume

Model	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept	140. 868			
Model of factor variables	53.783	87.086	18	0.000*

Sig at P<10%

Furthermore, the result of the multinomial logistic regression for the model in Table 9b showed that the probability of the model chi-square of the two factors (X^2=87.086, df =18, p= 0.000*) for the model. This shows that the model explain a significant association between the independent variables and dependent variable (sales volume). Put differently, impact of knowledge and network ties was statistically significant on the performance of micro and small technical enterprises in Southwestern Nigeria. Table 10a and 10b shows the multinomial logistic regression of forms of collaboration and comprehensiveness of business-related knowledge on staff strength of

the MSTEs considered in the study area. Table 10a showed the importance of the association of forms of collaboration and comprehensiveness of business-related knowledge (independently) on the staff strength of the respondents considered. The table revealed that the association of forms of collaboration with staff strength of MSTEs was statistically significant ($X2= 12.140$, df $= 6$, p $= 0.059*$). Likewise, the association of the comprehensiveness of business-related knowledge with staff strength of MSTEs was statistically significant ($X^2= 35.149$, df $= 12$, p $= 0.000*$). Furthermore, the result of the multinomial logistic regression for this model in table 10b showed the importance of the association of the two factors ($X^2=47.313$, df $=18$, p$= 0.000*$) for the model on the staff strength. This shows that the model explain a significant association between the independent variables and dependent variable (staff strength). Put differently, impact of knowledge and network ties was statistically significant on the performance of micro and small technical enterprises in Southwestern Nigeria.

Table 10a Result of multinomial logistic regression of forms of collaborations and comprehensiveness of business-related knowledge on staff strength

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	34.663ᵃ	0.000	0	.
Forms of collaboration	46.804	12.140	6	0.059*
Comprehensiveness of business related knowledge	69.812	35.149	12	0.000*

Sig at P<10%

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

Table 10b Result of multinomial logistic regression of forms of collaborations and comprehensiveness of business-related knowledge on staff strength

Model	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	81.977			
Model of factor variables	34.663	47.313	18	0.000*

Sig at P<10%

DISCUSSION

The study revealed that majority of the respondents are males. This study corroborated Kasim (2002), that entrepreneurship can be burdensome venture with the entrepreneur playing multifaceted role, such roles can be effectively played by males than females who prefer to engage in trading activities rather than production. This may also be attributed to the tag that technical entrepreneurship is a male dominated enterprise in the study areas. Males were always involved in carrying out such tasks like upholstery, carpentry and furniture, automobile mechanics and the likes. In addition, most of the technical entrepreneurs sampled were in the age group of 31 to 40 years, which showed that technical entrepreneurs were within their optimal productive age. Entrepreneurs that are not within this optimal productive age, either below or above should perform at abysmal level relatively (Adeyemo, 2014). This reaffirmed the conclusion of Adeyemo and Olatunji (2004) "strength to engage in ventures may have been drastically reduced and entrepreneurs above this productive age may not be able to carry out strenuous business activities". Furthermore, majority of the respondents are married. The findings affirmed the report of Dada (2014) that married people performed better in business management because of the social, financial and psychological supports than other categories of people and married people tend to work harder because of the responsibility and family commitments.

The study showed that respondents had low level of education (primary school). Findings revealed that educated entrepreneurs performed better than less educated ones (Sullivan and Marvel, 2011). Moreover, experience is a

major factor in business performance. The categories of business experience (14 years and above and 5-8 years) of the respondents indicates established and new venture. These two categories of firms' age corroborate with the findings of Li and Zhang (2007), that firms that are eight years old or younger are accepted as new venture and beyond eight years are established firms. In addition, Dada *et al.,* (2011) opined that work experience of the operators of food and beverage companies in Southwestern Nigeria influenced the technological capability and competitiveness of the industry. This means that business years of productive experience is significant to its performance and survival in a turbulent business period or business cycle.

All the aforementioned specialties were possible because individuals are thought to be specialist based on the knowledge they possess (Grant, 1996). In addition, Technical Entrepreneurs are subject specialist, by specialties of technical expertise and the capability to make quick modifications and adjustments to suit dynamic market conditions which makes them to set up viable technically based enterprises (Irefin, 2014).

The comprehensiveness of the business-related knowledge of the respondents were low, this might be resulted to their highest educational qualification (*see Table 2*). Hence, Yu (2001) affirms that a person's stock of business-related knowledge helps to frame newly acquired information, thus enhancing the individual's ability to interpret and act on it in useful ways. This was corroborated by Sullivan and Marvel (2011) that "business-relevant knowledge possessed by the entrepreneur may relate to desirable outcomes like employing workers during the early stages of venture development and further note that if a person has knowledge across business functions, the better its able to optimize aspects of the business like minimizing cost or maximizing profit." Likewise, entrepreneurs with more knowledge areas are related with enterprise that are more likely to survive and grow.

The study revealed that majority of the respondents collaborated with people of related business. Though, the number of their collaborations is low and their motives and motivations for collaborating with one another differs. Wu et al., (2008) proposed that "some network ties characteristics have been associated with entrepreneur gaining access to more tangible, resources that are important to successful early stage venturing". Hence, Maria *et al.* (2013)

note "three reasons for participating in the collaboration; business reasons (e.g. to improve image and recruit knowledgeable people), research reasons (e.g. to obtain better position within the area and access a broader knowledge base) and collective reasons (e.g. to form a joint agenda and to have a collective voice needed for making a difference). An important consequence of the different motives is that they constitute the basis for evaluating the performance of the collaboration". Therefore, entrepreneurs who rely on more numerous collaborations for business relevant purposes should be better positioned to accurately and efficiently use their knowledge sets as they develop their venture (Sullivan and Marvel, 2011). In addition, Hite and Hesterly (2001) proposed that networks that are high in compositional quality will lead to more desirable outcomes. Likewise, Baum *et al.* (2000) note that network efficiency refers to the diversity of network partners in terms of knowledge and capabilities such that there is little redundancy. In line with that, collaboration may provide technical entrepreneurs (TE) with an enhanced ability to focus their attention to the appropriate knowledge within their knowledge set relatively to decisions being made. The more networks TE is connected with, the more he is likely to perform better.

Moreover, the respondents had different phases of collaborations; former only, informal only and both former and informer collaborations. This was in line with Putnam (2001) that divided social network into informal and formal social networks. Formal networks include ties to voluntary associations such as trade associations and the like, while informal networks include ties held between family members, friends, and neighbors.

This study revealed that most of the benefits of collaborations considered are significant on the respondents. This study affirm other studies that collaboration benefit the stakeholders (Barr, 2000a; Hite and Hesterly, 2001; Baum *et al.*, 2000; Sullivan and Marvel, 2011).

The study justified the significant of the factor variables (comprehensiveness of business-related knowledge and network ties) on the response variables (staff strength, profit and sales); business performance. Therefore, entrepreneurs that want to increase the performance of his/her business should improve on his/her forms of collaboration and comprehensiveness of business-related knowledge.

The study concluded that improved knowledge of the operators of MSTEs and effective collaboration among them could lead to significant improvement of their performance.

From the findings and conclusion of the study, the following recommendations are made: (i) the study recommend that technical entrepreneurs, who are interested in increasing their staff strength, sales volumes and profit may be challenged to acquire more comprehensive knowledge areas and be connected to good forms of networks that will broaden their understanding about business environment. (ii) For policy makers/government who seeks to increase employment rate within their regions should empower technical entrepreneurs in terms of effective, efficient and affordable technical schools and also sensitize technical entrepreneurs via technical workshop/seminars on business model.

References

Adeyemo F. and Olatunji, O. (2004). *Technology training for small scale entrepreneurs* in D. Okongwu, and A. Saleh (eds), Fundamental Issues in Entrepreneurship, Yaba, lagos, Apex Books limited.

Adeyemo F.S. (2014).*Assessment of Support Services Provided by Institutions to Technical Entrepreneurs in South Western Nigeria:* Unpublished PhD. Thesis, Obafemi Awolowo University, Ile-Ife, Nigeria.

Aldrich, H., Elam, A. and Reece, P. (1997) 'Strong Ties, Weak Ties and Strangers' in *Entrepreneurship in a Global Context,* (Ed.) S. Birley and I. MacMillan, London, Routledge.

Anderson, C. (2008). *The long tail: Why the future of business is selling less of more*, Hyperion Books.

Arku, G. (2002). Collaboration in industry: Empirical findings among small electronics manufacturing firms in the Greater Toronto Area. *Geo Journal,* 57, 325-336.

Asheim, B. and Coenen, L. (2005). "Knowledge bases and regional innovation systems: Comparing Nordic clusters". *Research Policy* 34, 1173-1190.

Barr, A. (2000a). "Social capital and technical information flows in the Ghanaian manufacturing sector". *Oxford Economic Papers*, 52(3), 539-559.

http://dx.doi.org/10.1093/oep/52.3.539.

Baum, J., Calabrese, T. and Silverman, B. (2000). "Don't Go it Alone: Alliance Network Composition and Startups performance in Canadian Biotechnology," *Strategic Management Journals.* 21(3), 267.

Birley, S. Cromie, S. and Myers, A. (1990) 'Entrepreneurial Networks: Their Emergence in Ireland and Overseas', *International Small Business Journal*, 9(4), 56-74.

Borgatti, P., and Foster P. (2003). "The Network Paradigm in Organizational Research: A Review and Typology," *Journal of Management* 29(6), 991-1013.

Campbell, J. L. (2006). "Institutional Analysis and the Paradox of Corporate Social Responsibility," *American Behavioural Scientist. 49, 925-938.*

Chen, C., Tzeng L., Ou, W., and Chang, K. (2007). "The Relationship among Social Capital, Entrepreneurial Orientation, Organizational Resources and Entrepreneurial Performance for New Ventures". *Contemporary Management Research* 3(3) 213-232.

Chrisma, J., McMullan, E., and Hall, J. (2005). "The Influence of Guided Preparation on the Long-Term Performance of New Ventures," *Journal of Business Venturing*, 20, 769-791.

Curran, J., Blackburn, R. and Kitching, J. (1995) *Small Businesses, Networking and Networks: A Literature Review, Policy Survey and Research Agenda*, Small Business Research Centre, Kingston University, Kingston upon Thames.

Dada, A. D., Siyanbola, W. O., Ilori, M.O. and Olamide O. O. (2011): On the Nexus between Technological Innovations and Competitions of SMEs in a Developing Economy. Technology and the Global Challenges: Security, Energy, Water and the Environment. *Proceedings of the 20th International Conference on Management of Technology (IAMOT 2011), Miami Beach, Florida, USA*, April 10-14.

Dada, A.D. (2014). *Assessment of Technological Capability and Innovations in the Nigeria Cassava Processing Industry*. Unpublished PhD. Thesis, Obafemi Awolowo University, Ile-Ife, Nigeria.

Elisa, G. (2006). *"The uneven and selective nature of cluster knowledge networks*: evidence from the wine industry". Lund University Sweden.

Fenstermacher, G. D. (1995). From Camelot to Chechnya: The journey of an education College for Teacher Education.

Giuliani, E., and Bell, M. (2005): When Micro Shapes the Meso: Learning Networks in a Chilean Wine Cluster. *Research Policy*, 47-68.

Grant, R. M. (1996). "Toward a Knowledge-Based Theory of the Firm," *Strategic Management Journal.* 17, 109-122.

Greve, A., and Salaff J. (2003). "Social Networks and Entrepreneurship" *Entrepreneurship, Theory and Practice* 28(1), 1-22.

Hite, J. M., and Hesterly, W. S. (2001): "The Evolution of Firm Networks: From Emergence to Early Growth of the Firm," *Strategic Management Journal* 22(3), 275 – 286.

Johannisson, B. (1999) *Networking and Entrepreneurial Growth*: in Sexton, D.L. and Landstrom, H. (eds.) The Blackwell Handbook of Entrepreneurship 368.386. Oxford, Blackwell.

Kasim, M. O. (2002): An Overview of technology utilization within the SMEs. *Paper presented at the 6th International Conference, Lagos*, October 28, 7-9.

Keeble, D, Wilkinson F. 1999. Collective learning and knowledge development in the evolution of regional clusters of high technology SMEs in Europe. *Regional Studies* 33 (4): 295-303.

Kogut, B., and Zander (1992). "Knowledge of the Firm, Combinative Capabilities and the Replication of Technology," *Organization Science* 3(3), 383-397.

Li, H., and Zhang, Y. (2007): "The Role of Managers' Political Networking and Functional Experience in New Venture Performance: Evidence from China's Transition Economy," *Strategic Management Journal* 28, 791-804.

Lyon, F. (2000). Trust, networks and norms: The creation of social capital in agricultural economies in Ghana. *World Development* 28, 4, 663.682.

Malmberg, A. (2003). *Beyond the cluster - Local milieus and global economic connections.* In Remaking the Global Economy, ed. J Peck, H.W.C. Yeung. London: Sage Publications.

Maria, E., Tobias F., and Susanne, O. (2013) "Leveraging on open innovation: A study of why organizations engage in open innovation collaboration" *NFF conference in Iceland.*

McGhee, J. E., Dowling, M. J. and Meggison, W. L. (1995) Co-operative Strategy and New Venture Performance: The Role of Business Strategy and Managerial Experience, *Strategic Management Journal*, 16: 563-80.

National MSME Collaborative Survey (2010), Survey Report on Micro, Small Medium Enterprises (NMSMECS) in Nigeria. *Preliminary Report.*

Osotimehin, K. O., Jegede, C. A., Akinlabi, B. H (2012). "An Evaluation of the Challenges and prospects of Micro and Small Scale Enterprises Development in Nigeria. *American international journal of Contemporary Research.* 2 (4).

Putnam, R. D. (2001), Social capital: Measurement and consequences. *Canadian Journal of Policy Research*, 2(1), 41-51.

Rahmani, Z. and Iran, M. (2010).The interplay of social aspects of entrepreneurship, absorptive capacity and innovation performance: a conceptual framework. *International Conference on Business and Economics Research IACSIT Press, Kuala Lumpur, Malaysia*.

Shaw, E. (1998) Social Networks: Their Impact on the Innovative Behaviour of

Small Service Firms, *International Journal of Innovation Management*, 2(2), 201-222.

Shaw, E. and Conway, S. (2000) *Networking and the Small Firm* in Carter, S. and Jones-Evans, D. (eds.) Enterprise and Small Business: Principles, Practice and Policy 367.383. Harlow, Pearson Education.

Smith, K. G., Collins, C, J. and Clark K. D. (2005). "Existing Knowledge. Knowledge Creation Capability and the Rate of New Product Introduction in High-Technology Firms" *Academy of Management Journal* 48(2), 346-357.

Sullivan D. and Marvel M. (2011). "How Entrepreneurs' Knowledge and Network

Ties Relate to the Number of Employees in New SMEs". *Journal of small Business Management,* 185-206.

Udaejah, G. (2006). "Industrial Firms Lose N 38 Billion to Power Outage". *The Guardian August, 29, 3.*

Uzor, O. O. (2004). Small and Medium Scale Enterprises Cluster Development in South Eastern Region of Nigeria. *Institute for World Economics and International Management,* 5-15.

West, G. P. III, and Noel T. W. (2009). "The Impact of Knowledge Resources on New Venture Performance" *Journal of Small Business Management* 47(1), 1-22.

Wood, J.S. (2005). "*The Development and Present State of the Theory of Entrepreneurship*", in Product and Asset markets. Accessed on 25/10/2014.

Wu, L. Wang, C., Chen, C., and Pan, L. (2008). "Internal Resources, External Network, and Competitiveness during the Growth Stage: A Study of

Taiwanese High-Tech Ventures," *Entrepreneurship, Theory and Practice* 32(3), 529-549.

Yu, T. (2001). "Entrepreneurial Alertness and Discovery," *The Review of Austrian Economics* 14(1), 47-63.