

University of Lagos Pre-service STM Teachers: Would They Function More as Entrepreneurs or as Intrapreneurs?

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Abstract

The study investigated whether pre-service STM teachers would function more as entrepreneurs or intrapreneurs using determinants such as personal characteristics, interpersonal skills, critical and creativity thinking skills, business skills as well as their choice of course. Three research questions were raised and answered using a mix method design. A questionnaire entitled “Entrepreneurship Ability Scale Questionnaire” was the self-validated instrument used to collect data. A random sample of 220 students comprising 114 males and 106 females was used. Data collected was analysed using logistic regression, multivariate analysis of variance as well as qualitative narrative analysis. Results showed that University of Lagos pre-service STM teachers are more likely to act as entrepreneurs rather than intrapreneurs. Personal characteristics, interpersonal skills, critical and creativity thinking skills as well as business skills were effective in reliably predicting their entrepreneurship abilities. Course of choice was not effective in reliably predicting entrepreneurship abilities of the teachers. Entrepreneurship abilities of pre-service teachers are not a function of their gender. Business skills top the list of skills acquired by the STM pre-service teachers as a result of their exposure to the course GST307: Entrepreneurship and Corporate Governance. Practical activities including field trips were the suggestion of many participants as a way of enhancing the teaching and learning of Entrepreneurship and Corporate Governance. It is recommended that practical activities including field trips be incorporated into GST307. A tracer study monitoring whether pre-service STM teachers are into intrapreneurship or entrepreneurship in the next five years is suggested.

Keywords: Science, Technology and Mathematics (STM) teachers, Entrepreneurship, Intrapreneurship, Business skills, Personal characteristics, Interpersonal skills

Introduction and Contextual Background

Nigeria is the most populous country in Africa with staggering potential for a flourishing country based on the vast deposits of oil reserves and other essential mineral resources that the country is endowed with, as well as the availability of an extensive and readymade market. Nevertheless, the country is faced with numerous challenges that hinder overall development, which cast a huge question mark on the often touted slogan “Giant of Africa”. Nigeria is ranked 158 on the United Nations Development Programme Index for Development (UNDP, 2009). Despite many economic reforms to alleviate the poor economic conditions in Nigeria, it is yet to fare better. Arunma (2009) notes factors that hamper becoming successful entrepreneurs to include poor electricity supply, inadequate access to finance, high crime rate, political environment, and corruption. Though it is impossible for any government in the world, Nigeria inclusive, to provide jobs for all her working population, statistics show that close to 60% of Nigerians of working age are unemployed (Financial Standard, 2009).

The concept of entrepreneurship, whether within an established organization called intrapreneurship or independent entrepreneurship external to any known establishment, is inextricably tied to the concept of science. Churchill (1992) posits a definition that seems not too attached to a particular perspective. It says that the concept of entrepreneurship is seen as the process of uncovering and developing an opportunity to create value through innovation and seizing that opportunity without regard to either resources (human and capital) or the location of the entrepreneur – in a new or existing company. Science provides an organized knowledge that drives an enterprise or a firm or industry. Scientific knowledge is increasingly replacing industrial organization and production as the major

source of productivity (Otuka, 2012). According to Otuka (2012), knowledge society refers to a society where knowledge is the primary production resource instead of capital and labour. The characteristics of a knowledge society are well documented by Evers (2000). Application of scientific knowledge leads to technology. Technology comes in form of this applied scientific knowledge premised on distinct epistemic culture of knowledge which provides a cutting edge for an enterprise or a firm over its rival competitors. Technology leads to innovation and the long-term effect of these activities from various entrepreneurs or firms whether external or internal (intrapreneur) results in the development and wealth creation of such nations. In knowledge societies, there is synergy between universities and entrepreneurs.

Entrepreneurship can manifest itself in many forms, expressed, for example, as entrepreneurial engagement levels ranging from nascent entrepreneurs to owner-manager new firms, owner manager established firms to past owner-managers (Grilo et al, 2008; Stam, et al, 2010). The literature has distinguished a number of different types of entrepreneurs. They include social entrepreneurs, serial entrepreneurs, lifestyle entrepreneurs and cooperative entrepreneurs (Elkington, 2007 ; Frelise et al, 2009 ; Rural Entrepreneurs Case Studies, 2010 ; Wadhwa, 2010 ; Zahra, et al, 2009:519). Bosna, et al (2011) view intrapreneurship to refer to initiatives by employees in organizations to undertake new business activities.

Key behavioral aspects of intrapreneurship are personal initiative, active information search, out of the box thinking, voicing, championing, taking charge, finding a way and some degree of risk taking (Crant, 2000; Lumpkin, 2007; Parker et al , 2010). Kuratko (2007) is of the opinion that the literature is sometimes confusing in underlining what exactly makes an entrepreneur different from an intrapreneur and what the two have in common. Other authors have also pinpointed some differences between entrepreneurship and intrapreneurship even though intrapreneurship is rooted in entrepreneurship (Amo et al, 2005; Antoncic, 2001; Davis, 1999; Honig, 2001). There are several differences between these two concepts. In this context Antoncic et al, (2003) note that while intrapreneurs make risky decisions by using the resources of the company, the entrepreneurs make risky decisions using their own resources. Intrapreneurship takes place among employees from within an organization while entrepreneurship tends to mainly be externally focused (Antoncic et al, 2003; Davis, 1999).

The philosophy that serves as the fulcrum of the Department of Science and Technology Education in the University of Lagos is premised on the belief that Science and Technology Education is a developmental instrument for economic growth, life and environmental sustainability. (Department of Science and Technology Education Students' Handbook, 2010 p.12) In view of this, the department has the main portfolio of training teachers to be able to apply scientific knowledge coupled with technological culture in the world of work either within an established organization (Intrapreneur) or as an independent entrepreneur. It strives to achieve this by ensuring sound innovative pedagogical strategies as well as fostering acquisition of knowledge and providing a moderate environment for creativity to thrive. Knowledge in this regard is both tacit and explicit. The tacit knowledge, which is anchored on experience, thinking and feelings in a specific context, has both cognitive and psychomotor (technical) components. The explicit dimension of the Science, Technology and Mathematics Education is also well taught and this is in the form of articulated knowledge which is codified and communicated. It may be communicated in the form of symbols, formulae, words, and numbers or made tangible as equipment/devices, documents or models.

Personal characteristics are essential to the success of an entrepreneur. Research has found entrepreneurs to be highly creative with a tendency to imagine new solutions by finding opportunities for profit or reward (Olakitan, 2011). Gender is one personal characteristic which the literature has shown that the gap is closing up. Gender gap in entrepreneurship has narrowed during the past decades. But the share of female entrepreneurs engaged in venture-creating activities is still comparatively low in many countries (Delmar et al , 2000; Reynolds, et al, 2004; Arenius et al, 2005; Bosma et al, 2007; Parker, 2009). Researchers have addressed gender differences in entrepreneurship with respect to venture creation, growth aspirations (Cliff, 1998), innovation (Strohmeier et al, 2005), and new venture performance in terms of survival (Kalleberg et al, 1991). In our clime, Onwuka (2011) found gender differences in entrepreneurial skill assessment of undergraduate youths in Madonna University, Okija.

Although certain entrepreneurial traits are required, entrepreneurial behaviours are dynamic and influenced by environmental factors. Shane et al, (2000) argue that the entrepreneur is solely

concerned with opportunity recognition and exploitation, although the opportunity that is recognized depends on the type of entrepreneur, and Ucbasaran et al (2001,) argue that there are many different types, depending on business and personal circumstances. There seems to be no identified study probing into the entrepreneurship abilities of teachers before they are released into the labour market. This study therefore focussed on whether pre-service STM teachers function more as intrapreneurs or entrepreneurs when predicted from their personal characteristics, interpersonal skills, critical and creative thinking skills as well as business skills.

Statement of the Problem

The concern of the Nigerian government is to make as many people as possible self-employed, particularly the teeming young graduates. In the last quarter of 20th century, the Nigerian government has made spirited efforts at ensuring that unemployment is reduced. Lofty as this ideal is, increasing cases of unemployment have become a festering sore in the Nigeria economy. To create a way out of this especially for Nigerian undergraduates, Nigerian former president, Olusegun Obasanjo, in a bid to reduce the unemployment rate and to achieve one of the aims of Vision 20: 2020 which bothers on wealth creation mandated that all university students in Nigeria, regardless of their major discipline will need to study entrepreneurship before graduation (Onwuka, 2011).

Science, Technology and Mathematics education graduates are primarily being trained to teach in secondary schools in Nigeria, as well as to fit into the world of work which is also related to their field. Teaching used to be a fairly easy job to get, but it is now more and more difficult to get a teaching job. Thus, the issue of entrepreneurship is a very relevant concept to an individual and to the society at large. University of Lagos students, STM pre-service teachers inclusive, are expected to take a course entitled: Entrepreneurship and Corporate Governance at the 300 Level before they graduate. In addition, their exposure to various hands-on and minds-on activities in the various courses they had undertaken in their faculty and cooperating faculties should necessarily equip them to function effectively working within an organization (Intrapreneur) or as independent entrepreneurs. The extent to which all these experiences foster entrepreneurship abilities in students culminates in the problem of this study.

Purpose of the Study

The main purpose of the study was to ascertain whether STM Pre-service teachers would function more as entrepreneurs or intrapreneurs based on their responses to an entrepreneurship/intrapreneurial abilities questionnaire. Specifically, it ascertained variables which were central in predicting Pre-service STM entrepreneurship/intrapreneurship abilities. It also ascertained whether significant differences existed in entrepreneurship/intrapreneurship abilities among pre-service STM teachers according to their gender. It also probed into the specific entrepreneurship abilities acquired by pre-service STM teachers and suggested how to improve the teaching and learning of *GST 307: Entrepreneurship and Corporate Governance*.

Research Questions

- (1) Can status (entrepreneurship or intrapreneurship) be reliably predicted from knowledge of: degree type, personal characteristics, interpersonal relationship skills, critical and creative thinking skills, business skills and course of choice of Pre-service STM teachers?
- (2) If entrepreneurship ability status can be correctly predicted, which variables are central in the prediction of that status?
- (3) Are there significant mean differences in entrepreneurship/intrapreneurship abilities among Pre-service STM teachers according to their gender?
- (4) What are the specific entrepreneurship abilities that students have acquired as a result of taking the course GST 307?
- (5) What are students' suggestions on how the teaching and learning of GST 307 can be further enhanced to improve acquisition of their entrepreneurship abilities?

Methodology

Design

The mix method design was used. It incorporated both quantitative and qualitative mode of data collection and analysis. The quantitative part was a non-experimental one of the survey type while the qualitative part involved narrative analysis as well as using a descriptive non-numerical approach to illustrate frequency of some categories obtained from the analysis. The survey design was used to elicit information from STM pre-service teachers in order to ascertain whether they would function as entrepreneurs or intrapreneurs.

Population, Sampling Technique and Sample

The population for the study was made up of all the final-year students in the Department of Science and Technology Education in the University of Lagos. The final sample was made up of eighty percent of the final-year students offering chemistry, biology, physics and integrated science (science education), mathematics and technology education in the Department of Science and Technology Education, University of Lagos and this was based on the simple random technique. This sample comprises 114 males and 106 females.

Instrumentation

The researchers made use of a self-validated questionnaire titled Entrepreneurship Ability Scale Questionnaire (EASQ). The questionnaire consists of two parts and these are: the bio-data section comprising the degree in view at three levels: physics, chemistry, biology, integrated science (science education), mathematics education and technology education. Section B comprises four sections: personal characteristics consisting of eight items, interpersonal skills consisting of fifteen items, critical and creative thinking skills consisting of five items and business skills consisting of fourteen items. The response format for the instrument was: *Strongly Agree* scored 4 marks, *Agree* scored 3 marks, *Disagree* scored 2 marks and *Strongly Disagree* scored 1 mark for positively worded items. Negatively worded items were scored in the opposite direction.

Section C of the instrument is to ascertain the influence of the Entrepreneurship and Corporate Governance course (GST 307) on the entrepreneurship ability of pre-service STM teachers. It consists of three items (two of which are open-ended) which pre-service STM teachers responded to. EASQ was face validated by the first and third authors of this work and by two other lecturers in the department of science and technology education to ensure that the instrument measures what it purports to measure. The reliability of the instrument was done scale by scale as well as the overall scale to ensure that the items hang together and this was ascertained using internal consistency of items measured by Cronbach alpha. The values of the sub-scales were computed and gave values ranging from 0.784 to 0.847. The overall reliability of the instrument was also measured using Cronbach alpha and it gave a value of 0.812 which indicated that the instrument was reliable.

Data Analysis

Research questions were answered using descriptive statistics of mean, standard deviation, binomial logistic regression, multivariate analysis of variance, and qualitatively using narrative analysis.

Results

Research Questions 1 and 2

(1) Can status (entrepreneurship or intrapreneurship) be reliably predicted from personal characteristics, interpersonal relationship skills, critical and creative thinking skills, business skills and course of Pre-service STM teachers?

(2) If entrepreneurship ability status can be correctly predicted, which variables are central in the prediction of that status?

Table 1: Logistic Regression Model of Prediction of Entrepreneurship or Intrapreneurship Abilities of Pre-service STM Teachers

Variables	BSE	Walddf	Sig.	Exp (B)		
Personal Characteristics	.618	.175	12.450	1.000	.000	1.855

Interpersonal Skills	.587	.117	25.122	1.000	.000	1.798
Critical and Creativity Skills	.539	.179	9.009	1.000	.003	1.714
Business Skills	.549	.132	17.268	1.000	.000	1.732
Type of Degree			2.909	1.000	.234	
Type of Degree (1)	.855	.863	.983	1.000	322	2.352
Type of Degree (2)	-.941	1.344	0.491	1.000	.484	0.394
Constant	70.462	12.757	30.511	1.000	.000	0.000

Model Fit Summary: Model $X^2 = 243.132$ ($p = .000$) **Prediction Success:**
-2loglikelihood = 61.698 Intrapreneurship Ability = 97.3%
Cox and Snell R Square = .669 Entrepreneurship Ability = 99.1%
Nagelkerke R Square = .892 Overall = 98.2%

Table 1 shows that logistic regression analysis was conducted to classify Pre-service STM teachers into entrepreneurship or intrapreneurship ability using personal characteristics, interpersonal skills, critical and creativity thinking skills, business skills as well as type of degree as predictors. A test of the full model against a constant model was statistically significant indicating that the predictors as a set reliably distinguish between intrapreneurship and entrepreneurship abilities ($X^2 = 243.132$, $df = 6$, $p < .000$). Nagelkerke's R^2 of .892 from Table 1 indicated a very strong relationship between the predictor and grouping. This indicates that the predictors accounted for 89.2% of the variance. Prediction success overall was 98.2% (97.3% for intrapreneurship ability and 99.1% for entrepreneurship ability). The Wald criterion indicates that personal characteristics, interpersonal skills, critical and creativity thinking skills and business skills made a significant contribution to prediction ($p < .05$ respectively). Table 1 shows that type of degree was not a significant contribution to the prediction. The reference category was the entrepreneurship ability for the categorical dependent variable. If personal characteristics are to be raised by one unit (one person), the odds ratio (Exp B) would be 1.855 as large and therefore the pre-service STM teachers are 185.5% more likely to become entrepreneurs. Other findings can also be explained along that line.

Research Question 3

Are there significant mean differences in entrepreneurship/intrapreneurship abilities among Pre-service STM teachers according to their gender?

Table 2 shows that there was no significant combined mean differences in entrepreneurship abilities of pre-service STM teachers according to their gender (Pillai's Trace for gender = 0.23, $F(4, 215) = 1.90$, $p = 0.11$).

Table 2: Multivariate Analysis of Variance Table of Entrepreneurship/Intrapreneurship Abilities According to Gender

Independ. Variable	Dependent Variable	Groups	Mean	Multivariate SD	Effect $F_{4,215}$	Value	Sig.	Size
Gender	Personal Characteristics	Female	23.08	3.73	1.90	0.23	0.11	0.03
		Male	22.23	3.89				
Gender	Interpersonal Skills	Female	45.03	6.36	1.90	0.23	0.11	0.03
		Male	43.34	7.80				
Gender	Critical & Creative Skills	Female	14.09	2.04	1.90	0.23	0.11	0.03
		Male	14.11	4.10				
Gender	Business Skills	Female	39.81	4.97	1.90	0.23	0.11	0.03
		Male	39.21	4.58				

Box's Test of Equality of Covariance Matrix was significant ($F(10, 224417.198) = 8.180$, $p = .000$). Thus, Pillai's Trace was used as the test statistic.

Research

Questions 4 and 5

- (4) What are the specific entrepreneurship abilities that students have acquired as a result of taking the course GST 307 (Entrepreneurship and Corporate Governance)?
- (5) What are students' suggestions of how the teaching and learning of GST 307 can be further enhanced to improve acquisition of their entrepreneurship abilities?

Matrix 1: Categories of Specific Entrepreneurship Abilities of Pre-service STM Teachers

S/N	Categories of Entrepreneurship Abilities Acquired	Frequency
1.	Basic Knowledge	*
2.	Interpersonal Skills	*
3.	Creativity and Critical Thinking Skills	*
4.	I did not get to know anything in the course	*
5.	Business Skills	***

Key: **** represent *Most* participants
 *** represent *Many* participants
 ** represent *Some* participants
 * represents *Few* participants

Matrix 1 shows that few STM pre-service teachers (participants) gained basic knowledge, acquire interpersonal skills as well as creativity and critical thinking skills with regard to GST 307(Entrepreneurship and corporate governance). Also, few participants indicated that they did not get to learn or acquire any specific entrepreneurship abilities from GST 307 course. Business skills were the most acquired entrepreneurship ability among the pre-service STM teachers. Some of the responses of participants (Pre-service STM Teachers) with regard to the specific entrepreneurship abilities are hereby captured verbatim.

Participant A:

Knowing how to make one's business grow and yield more income

Participant B:

Knowing what is needed in the market and skills to produce such things and supply them

Participant C:

Creating a market for an unknown product

Matrix 2: Categories of Suggestions on Improving the Teaching and Learning of GST 307

S/N	Categories	Frequency
1.	More lecturers should be assigned to teaching the course	*
2.	Involvement in practical activities/field trips	***
3.	Making the class interactive	*
4.	Lecturers and students should take the course more seriously	**
5.	Seminars/ Bringing accomplished entrepreneurs to deliver lectures	*

Key: **** represent *Most* participants *** represent *Many* participants
 ** represent *Some* participants * represent *Few* participants

Matrix 2 shows that many participants (STM pre-service teachers) were of the opinion that the teaching and learning of GST 307 can be improved upon by making it practical oriented or using field trips. Some participants were also of the opinion that lecturers and students need to take the course more

seriously by way of attending classes regularly by assigning credit units to the course. Few participants were also of the opinion that more lecturers should be assigned to the course to reduce student-teacher ratio while also suggesting that ICT usage as well as making the class more interactive can also enhance the teaching and learning of GST 307. Lastly, few participants held the conception that bringing established/seasoned entrepreneurs for lectures or seminars would enhance the teaching and learning of GST 307. Some of their responses are captured as follows:

Respondent K

Adequate time should be invested in the course. More units should be added to the course because it is a very vital course that equips undergraduates to be self-employed thus helping to reduce unemployment in Nigeria, thereby eradicating crime rate and poverty.

Respondent L

Practical application of entrepreneurship skills by students who are interested in setting up a business should be encouraged and followed

Respondent M

They (school authorities) should make the course compulsory with a good unit (3units) to make students serious and ready to learn.

Discussion

Table 1 on Logistic regression shows that entrepreneurship ability was more favoured over intrapreneurship ability as the prediction success of entrepreneurship ability was 99.1% while that of intrapreneurship ability was 97.3%. This is an indication that Pre-service science, mathematics and technology education teachers are most likely to function as entrepreneurs rather than intrapreneurs. This finding may not be unconnected with the increasing awareness of the rate of unemployment in Nigeria, which has climbed to an all-time high of 23%. Another reason for the preference for entrepreneurship as compared to intrapreneurship could be the basic knowledge acquired from GST 307 – a course which was introduced based on the stark reality of the grossly inadequate jobs available for the teeming unemployed graduates. Kirby (2002) in a masterpiece write-up on MBA graduates at Surrey University, United Kingdom entitled “Entrepreneurship Education – Can the Business Schools Meet the Challenge?” observes that they have less tendencies to be entrepreneurial. Indeed, their entrepreneurial tendencies were found to be even lower than those derived from an admittedly smaller sample of Lecturers and Trainers. Such a finding indicates the challenge facing business schools if they are to create entrepreneurs as, increasingly, appears to be required.

Personal characteristics and interpersonal skills of pre-service STM teachers were strong predictors of entrepreneurship abilities. These findings are well supported in the literature (Crant, 2000; Lumpkin, 2007; Olakitan, 2011; Parker et al, 2011; Uchasaran, 2001). This implies that characteristics such as using initiatives, being in charge and taking decisions as well as having the belief that one can always improve are considered vital in choosing to be an entrepreneur. Relationship with workers employed, business associates, communication abilities, among other interpersonal skills as this study has shown are effective predictors of whether an individual will become an entrepreneur or not. If an individual is low on these measures, there is likelihood to believe that there is an escape route – that is to become an intrapreneur. This is not to diminish the challenges involved in being an intrapreneur when intrapreneurship is conceived in its most tightly bound definition. Critical and creative thinking skills and business skills were also effective predictors in this study and these are amply supported in the literature ((Antoncic et al, 2003; Baumol, et al 2003; Kamalamabhan, 2009; Shama et al, 1999; Shane et al, 2000).

This study observes no significant combined mean difference in the entrepreneurship abilities among Pre-service STM teachers according to gender. Although the literature indicates a narrowing of gender gap in entrepreneurship abilities (Arenius et al, 2005; Bosma, et al; Delmar et al, 2000; Parker, 2009; Reynolds et al, 2004), it stands to reason that this may not be unconnected with the fact that most women entrepreneurs are married with children and this, to a large extent, tends to confer an extra burden on women which tends to limit their entrepreneurship abilities. Business skills were the most acquired by Pre-service STM teachers as a result of their exposure to GST 307(Entrepreneurship and Corporate Governance). According to them, the course reinforced their belief that one did not need huge

capital and social influence to succeed in business. Various suggestions as captured by many participants show the need for the course to move away from being factual and teaching knowledge alone as there is a need to be involved in practical activities or field trips in order to achieve the intended objective of the course.

Conclusion

This study has shown that pre-service STM teachers are more likely to function as entrepreneurs rather than intrapreneurs. Personal characteristics, interpersonal skills as well as business skills were considered as predictors of entrepreneurship among pre-service STM teachers. The decision of taking up entrepreneurship was also anchored on critical and creativity thinking skills. Female and male pre-service teachers are likely to take to entrepreneurship at the same level. Many participants (STM Pre-service teachers) claimed to have acquired some business skills as a result of their exposure to Entrepreneurship and Corporate Governance (GST 307). Critical and creativity thinking skills and interpersonal skills were acquired by a few participants as a result of their exposure to GST 307.

Recommendation

Involvement in practical activities and field trips are considered as measures to enhance the teaching and learning of GST 307. The course should be allotted credit units in order to engender some level of seriousness in the students. A tracer study monitoring whether pre-service STM teachers are into intrapreneurship or entrepreneurship in the next five years is recommended.

References

- Lumpkin, G.T. (2007). Intrapreneurship and innovation, in: J.R. Baum, M. Frese & R. Baron (eds), *The Psychology of Entrepreneurship*, Mahwah, New Jersey: Lawrence Erlbaum Associates, 237-264.
- .Nonenka, I., and Takeushi, H. (1995), *The knowledge-creating company*. New York: Oxford University Press
- .Olakitan, O. (2011). [cscanada.net/index.php/ihe entrepreneur leads the firm or organization
- .Onwuka, E.M. (2011). Development of Entrepreneurial Skills Assessment Inventory of Youths, a challenge to gender issues in entrepreneurship education. *VSRD International Journal of Business and Management Research*, 1 (9), 578-586.
- .Parker, S.K. and Collins, C.G. (2010). Taking Stock: Integrating and Differentiating Multiple Proactive Behaviors, *Journal of Management* 36 (3), 633-662.
- .Reynolds, P, Bosma, E. A, Steve H, de Bono N, Isabel S. Lopez-Garcia, P. and Nancy C. (2004), Global Entrepreneurship Monitor: Data Collection Design and Implementation 1998-2003, *Small Business Economics*, 24 (3), 205-231.
- Amo, B.W. (2006), Corporate entrepreneurship and intrapreneurship related to innovation behaviour among employees, paper for the 'Entrepreneurship from the employee's perspective' workshop at the Max Planck-Institut für Ökonimik, Jena, 2-3 February.
- Antoncic, B. and Hisrich, R.D. (2003), Clarifying the intrapreneurship concept, *Journal of Small Business and Enterprise Development*, 10(1), 7-24.
- Antoncic, B. Hisrich, R.D. (2001), Intrapreneurship: construct refinement and cross-cultural validation, *Journal of Business Venturing*, 16, 495-527.
- Arenius, P. and Minniti, M. (2005). Perceptual variables and nascent entrepreneurship, *Small Business Economics* 24(3), 233-247.
- Aruma, O. (2009), The role of entrepreneurship in transforming the Nigerian economy. Seventh convocation lecture Igbinedion university, Okada, Edo state, 4th December, 2009.
- Baumol, W.J., Litan, R.E. and Schramm, C.J. (2007). Good capitalism, bad capitalism and the economics of growth and prosperity
- Bosma, N and Harding, R. (2007). *Global Entrepreneurship Monitor: GEM 2006 Summary Results*: Babson College and London Business School.

- Bosma, N., Stam, E. and Wemmerkin (2011). Intrapreneurship vs. entrepreneurship: A cross national analysis of individual entrepreneurial behaviour. Retrieved from <http://www.uu.nl/rebo/economie/discussionpapers> on 15th August, 2012
- Churchill, N. C. (1992) "Research issues in entrepreneurship" (2003). In Antoncic, B & Hisrich, R, D, *Clarifying the intrapreneurship concept, Journal of Small Business & Enterprise Development*, pp. 7-24
- Cliff, J. E. (1998). Does one size fit all? Exploring the relationship between attitudes towards growth, gender. *Journal of Business Venturing*, 13(6): 523-542.
- Crant, M.J. (2000). Proactive behaviour in organisations. *Journal of Management*, 26 (3), 435-462.
- Davis, K. S. (1999). "Decision criteria in the evaluation of potential intrapreneurs", *Journal of Engineering & Technology Management*, pp. 295- 327
- Delmar, F. and Davidsson, P., (2000), "Where do they come from? Prevalence and characteristics of nascent entrepreneurs," *Entrepreneurship & Regional Development*, 12: 1-23.
- Department of Science and Technology Education, Faculty of Education, University of Lagos, Handbook (2012 p 10-12). Sibon Books Limited, Festac Town, Lagos
- Elkington, J. (2008). Key traits of social entrepreneurs Harvard business publishing house.
- Evers, H. (2000). Transition towards a knowledge based society: Malaysia and Indonesia in perspective. *Comparative Sociology*, 2 (1), 355-373.
- Financial Standard June (2009)
- Frehse, J, and Buhalis, D, (2009). The importance of lifestyle entrepreneurship: A conceptual study of the tourism industry, PASOS Vol. 7, No. 2 p393-405, 2009
- Global Entrepreneurship Monitor (2008) Executive Report
- Grilo, I and Thurik, A.R. (2007), Explaining entrepreneurship and the role of policy: a framework, in *The Handbook of Research on Entrepreneurship Policy*, , I. Grilo and A.R. Thurik (eds), (Edward Elgar Publishing Limited, Cheltenham, UK and Northampton, MA, US): 1-17.
- Honig, B. (2001). „Learning strategies and resources for entrepreneurs and intrapreneurs”, *Entrepreneurship Theory and Practice* , 26(1), pp. 21-35.
- Kalleberg, Arne L. and Kevin T. Leicht. (1991). Gender and Organizational Performance: Determinants of Small Business Survival and Success. *Academy of Management Journal*, 34(1): 136- 161.
- Kamalmabbhan, T.I. (2009). Skills associated with entrepreneurship. Indian Institute of Technology Madras, Management Science II.
- Kirby, D.A., (2002), Entrepreneurship. Maidenhead: McGraw-Hill
- Kuratko, D.F (2007). Corporate entrepreneurship, *Foundations and Trends in Entrepreneurship* 3 (2), 151-203.
- Olagunju Y.A (2004). Entrepreneurship and small scale Business Enterprises Development in Nigeria: University press Ibadan.
- Otuka, J.O.E. (2012). Enhancing the status of ICT knowledge and skills of teachers at the basic education levels in Nigeria. A memorial lecture delivered at the 53rd annual conference of the Science Teachers Association of Nigeria at Government Science and Technical College, Area 3, Garki, Abuja from 6-11 August, 2012.
- Parker, S.C. (2009). Why do small firms produce the entrepreneurs? *Journal of Socio- Economics* 38 (3), 484-494.
- Parker, S.C. (2010). Intrapreneurship or entrepreneurship?., *Journal of Business Venturing*, forthcoming.
- Rural Entrepreneurs, Case Studies. "E-commerce as a business strategy: lessons learned from rural and small town businesses". Retrieved 18 June 2012 at <http://www.doingbusiness.org/exploreconomies/?economyid=143>.
- Shane, S and Venkataraman, S. (2000). "The Promise of Entrepreneurship as A Field of Research", *Academy of Management Review*, Vol 25 (1), 217-226.

- Sharma, P., and Chrisman, J. J. (1999). Toward a reconciliation of the definitional issues in the field of corporate entrepreneurship, *Entrepreneurship Theory and Practice*, 23(3): 11- 27.
- Strohmeier, R. & Tonoyan, V. (2005). Bridging the gender gap in employment growth: On the role of innovativeness and occupational segregation. *International Journal of Entrepreneurship & Innovation*, 6(4): 259-273.
- Ucbasaran, D., Westhead, P. and Wright, M., (2001). "The Focus of Entrepreneurial Research: Contextual and Process Issues", *Entrepreneurship Theory and Practice*, Summer 2001.
- United Nations Development Programme. Human Development Index Report 2009.
- Wadhwa, V. "Is entrepreneurship just about the exit?". Retrieve 18 June 2012 at <http://www.doingbusiness.org/exploreconomies/?economyid=143>.
- Zahra, G and Neubaum, S. (2009). "A typology of social entrepreneurs: Motives, search processes and ethical challenges", *Journal of Business Venturing*, 24 (5), pp. 519–532

