Entrepreneurial Intentions Among Stem and Non-Stem Undergraduates of a Private University in Nigeria: A Comparative Study

Conference Paper · June 2020

CITATION
1

READS
218

7 authors, including:

Elizabeth Olowookere
Covenant University Ota Ogun State, Nigeria
43 PUBLICATIONS **177** CITATIONS
SEE PROFILE

Jonathan Adedayo Odukoya
44 PUBLICATIONS **409** CITATIONS
SEE PROFILE

Olujide Adekeye
Covenant University Ota Ogun State, Nigeria
70 PUBLICATIONS **443** CITATIONS
SEE PROFILE

Precious Emuchay
Covenant University Ota Ogun State, Nigeria
1 PUBLICATION **1** CITATION
SEE PROFILE

Entrepreneurial Intentions Among Stem and Non-Stem Undergraduates of a Private University in Nigeria: A Comparative Study

Elizabeth I. Olowookere
Department of Psychology, College of Leadership Development Studies, Covenant University, Ota, Nigeria
E-mail: elizabeth.olowookere@covenantuniversity.edu.ng

Precious C. Emuchay
Department Human Resource Management & Labour Relations, University of Venda, Thohoyandou 0950, South Africa
E-mail: emuchaychinyere@yahoo.com

Sunday S. Babalola
Department of Psychology, College of Leadership Development Studies, Covenant University, Ota, Nigeria
E-mail: sunday.babalola@univen.ac.za

Jonathan A. Odukoya
Department of Psychology, College of Leadership Development Studies, Covenant University, Ota, Nigeria
E-mail: adedayo.odukoya@covenantuniversity.edu.ng

Dare Ojo Omonijo
Department of Student Industrial Work Experience Scheme, Covenant University/ Department of Sociology, Olabisi Onabanjo University, Ago Iwoye, Nigeria.
E-mail: omonijoojo@yahoo.com or dareoomonijo@hotmail.com

Olujide A. Adekeye
Department of Psychology, College of Leadership Development Studies, Covenant University, Ota, Nigeria
E-mail: jide.adekeye@covenantuniversity.edu.ng

Benedict C. Agoha
Department of Psychology, College of Leadership Development Studies, Covenant University, Ota, Nigeria
E-mail: ben.agoha@covenantuniversity.edu.ng

Abstract

This study compared entrepreneurial intentions of STEM and non- STEM undergraduates of a private University in Nigeria. The survey research design and systematic random sampling technique were used in data collection and selection of participants. A total of 250 students (126 STEM and 124 non-STEM) across the five academic levels (100-500) participated in this study. Fifty-two percent (52%) of the participants were males and forty-eight percent (48%) were females. Four hypotheses were raised and tested using t-test for independent samples. The result revealed significant difference in entrepreneurial capacity [t (248) = .084, P<.01] and entrepreneurial intentions [t (248) = 2.397, P<.01] of STEM and non-STEM students. Furthermore, the result showed that non-STEM students reported higher entrepreneurial capacity [non-STEM (□=12.19); STEM (□=12.13)] and entrepreneurial intentions [non-STEM (□=14.79); STEM (□=12.56)]. Conversely, no significant difference was found in STEM and non-STEM students' capacity for developing new products and services [t (248) =1.387, P>.05] and attraction to entrepreneurship [t (248) = 1.296, P>.05]. This study concluded that although STEM and non-STEM students were similar in their entrepreneurial attraction and capacity for

developing new products/services, non-STEM students displayed more entrepreneurial capacity and intentions. Therefore, it was recommended that equal attention and opportunities be given to STEM and non-STEM students for entrepreneurship training and capacity building towards increased competitiveness and sustainable development in Nigeria.

Keywords: Entrepreneurial Intentions, STEM, Non-STEM, Undergraduates, Nigeria

Introduction

The technological revolution of the 21st century has spurred nations of the world to shift attention to science and technology. For instance, the former President of the United States of America, Barak Obama cited in Miller (2011), suggested that the survival and future of humans across the globe depend on science. According to him, perseverance, inventiveness and a passion for entrepreneurship are major requirements for economic sustainability in the future. Barack Obama asserted that science should be given topmost priority in all spheres of a nation's economy in order to gain competitive edge in the global milieu. To this end, efforts are being made to promote science, technology, engineering, and mathematics (STEM) disciplines at the different educational levels and the workplace for continuous improvement and sustainability.

Likewise, African nations, particularly Nigeria, now place priority on the STEM disciplines at the expense of arts and humanities (non-STEM) disciplines. These two categories of disciplines are interdependent as there is no use for technology if there are no humans to operate and harness its benefits. Science is important for the pace of advancement in the 21st century world economy, but much more important is the human relations. A neglect of the humanity and art disciplines is not healthy for sustainable development. The developed nations have superior technology and a robust economy compared to the developing nations. Science has been credited as the main source of the economic successes enjoyed by the developed nations. On the contrary, these nations employ a rounded approach to growth and development. They have developed human capital through quality education (Omonijo, Anyaegbunam, Adeleke, Nnatu, Ejor, Oluwunmi, Olowooere and Agubo 2019) which promotes their ever evolving technology base.

The developing nations are the worst hit by the wave of recession that plagued the world economy in the 21st century. The National Bureau of Economic Research (2008) defined a recession as prolonged substantial drop in economic activity across sectors, that lingers for more than a few months, resulting in increased unemployment rate, decreased real gross domestic product, drop in real income and dwindled industrial production and distribution of goods. African nations have been wallowing in unemployment, poverty and untold hardship. Typical of the youth, they devised ways of coping with this menace by trading their endowments for economic gains. The youth population in the developing nations have taken to self- employment, engaging their talents and skills in the production of goods and services for economic gains. This self-motivated engagement in profit making ventures is known as entrepreneurship.

Entrepreneurship refers to individuals' demonstration of ability and interest in starting up and running money making ventures involving financial risks (Oxford Learners dictionary, 2019; Omonijo, Adetola, Lawal, Odukoya, Olowookere, Okunlola and Rotimi, 2019). Pandit, Joshi and Tiwari (2018) claimed that entrepreneurship is very crucial to economic development in the 21st century global economy. They linked entrepreneurship to resourcefulness, international collaboration, best practices and knowledge sharing. In corroboration, Yusuf and Albanawi (2016) observed that entrepreneurs have made profound contributions to economic growth through their skilfulness, dedication and inventiveness. For instance, Saudi Arabia was globally rated as one of the fastest growing economy because of its endorsement of entrepreneurship. Hamod (2010) also claimed that entrepreneurship has immensely impacted Saudi Arabia's economic development. This explains the popular assumption that entrepreneurship is an integral part of a nation's economy.

For most African countries, integrating entrepreneurship into academic curriculum is considered a viable intervention to the unremitting global economic crises. However, the technological revolution

of the 21st century seem to have shifted research focus to pure science disciplines with very little consideration for arts and humanities. For instance, Saiden (2017) recommended that all aspects of entrepreneurship be incorporated into the curriculum with emphasis on STEM components as the driver of economic development. It was also noted that a union exists between entrepreneurship education and STEM training in Japan, and that this accounted for the successes and economic development recorded in the country. The belief is that sustainable growth and development stems from unwavering devotion to inventiveness and best practices that can only be generated by STEM. Therefore, the pursuit of entrepreneurial education should be with special emphasis on STEM disciplines.

In validation, Godwyn (2017) the continued relevance of United States in the twenty-first century global economy is dependent on STEM activities in the Small businesses. Stating that STEM occupation has the prospect to grow the US economy twice has much as the non STEM. This explains the assertion made by the former US president (cited in Miller, 2011) that the maintenance of superior STEM-related human capital development through quality education will have impact on every aspect of life. However, it should be noted that while the importance of STEM to sustainable development cannot be denied, the neglect of the non-STEM disciplines will result in grave consequences for the nations and the world at large in the not too distant future.

Although global efforts at entrepreneurial education have tilted towards STEM, the interest of the concerned individuals in entrepreneurship should be put into consideration. Since it is popular opinion that people succeed best in their areas of interest, it is necessary to assess the entrepreneurial inclination of both STEM and non-STEM students for informed decisions. Consequently, this study focused on comparing entrepreneurial intentions (interest in entrepreneurship) of STEM and non- STEM students in a private University in Nigeria.

Statement of Objectives

i. To compare STEM and non-STEM students on entrepreneurial capacity
ii. To ascertain the differences in entrepreneurial intentions of STEM and non-STEM students.
iii. To determine the differences in STEM and non-STEM students' capacity for developing new products and services.
iv. To compare STEM and non-STEM students on attraction to entrepreneurship

.

Research Hypotheses

i. STEM and non-STEM students will not significantly differ in entrepreneurial capacity
ii. There will be no significant difference in STEM and non-STEM students' entrepreneurial intentions
iii. STEM and non-STEM students will not significantly differ in capacity for developing new products and services.
iv. There will be no significant difference in STEM and non-STEM students' entrepreneurial attraction to entrepreneurship

Literature Review

Theoretical Framework

Super Self-Concept Theory

Super (1951) proposed the Self-Concept Theory of career development based on the notion that the choice of one's occupation evolves over time. The main assumption is that an understanding of the self-concept exerts major influence on vocational choice. Interests, abilities, personality traits, needs and values are the major determinants of career choices and preferences. The individual differences in abilities, interests, needs and personalities make persons well suited for particular occupations. To this

effect, individuals experience career satisfaction when there is a match between their jobs and self-concept.

Students' choice of STEM or non-STEM disciplines are influenced by their self-concept, those who see themselves are as having the required ability to thrive in pure science disciplines opt for the STEM option and those who think otherwise choose other disciplines that matches their idea of who they are. In the same vein, students' attitude to entrepreneurship may be explained to be a consequence of their self-concept.

Empirical Review

Bicer, Navruz, Capraro, Capraro, Oner, and Boedeker (2015) described STEM education as involving pedagogical activities in the fields of science, technology, engineering, and mathematics. They further asserted that relevance of any nation in the global context is determined by the quality of its STEM education and practices.

Entrepreneurial intention is the personal mind-set of entrepreneurs that inspires their implementation of entrepreneurial behaviour (Krueger, Reilly & Carsrud, 2000). Studies have observed that Universities now use entrepreneurship education to promote economic and social development in different nations of the world (Fiore, Sansone & Paolucci, 2019). This has opened up research on entrepreneurship and associated factors in the academia. Similarly, Boissin Favre-Bonté and Fine-Falcy (2017) noted that studies have investigated the concept of entrepreneurial intentions, but there is a dearth of literature on the comparison of entrepreneurial intentions among student categories.

Dizik (2017) reported that after taking entrepreneurship courses, STEM students had a slight increase in their entrepreneurial intentions. But Business-school students were reported to have significant increase in their entrepreneurial intentions after exposure to entrepreneurship courses. In corroboration, Sharma and Pankaj (2014) opined that prior exposure to business related courses may account for the differences in entrepreneurial intention of STEM and business students. On the contrary, Godwyn (2017) reported no association between exposure to entrepreneurship activities and the intent to open a STEM -related business. Rather, Krueger, *et al.* (2000) explained intentions and attitudes as consequences of situation and person variables. Similarly, Hou, Su, Lu and Qi (2019) explained students' entrepreneurial intentions as determined by their internal factors and specific situational factors. That is, person characteristics combine with situational factors to influence students' attitude towards entrepreneurship. Furthermore, Dizik (2017) blamed the entrepreneurial indifference displayed by STEM students on approaches used in entrepreneurial training and other environmental determinants. For instance, it was noted that Engineers do not display zeal towards entrepreneurship when they are taught together with non -STEM counterparts (Dizik, 2017).

Method

The research design employed in this study is a survey and the sampling technique is the systematic sampling. The Population of study are students of Covenant University from which a sample of 250 participants was drawn from the A total of 250 students the STEM and non-STEM disciplines across the five academic levels (100-500) in the University. Fifty-two percent (52%) of the participants were males and forty-eight percent (48%) were females. School of Human Resource Development through the Purposive Sampling technique. A total of 250 students (126 STEM and 124 non-STEM) across the five academic levels (100-500) participated in this study. Fifty-two percent (52%) of the participants were males and forty-eight percent (48%) were females.

The instrument used in this study is an 18 item Entrepreneurial Intention Questionnaire adapted from the original work of Liñán, Rodríguez-Cohard and Rueda-Cantuche (2011). Four aspects of entrepreneurial intention assessed based on the EIQ are professional attraction (labelled as entrepreneurial attraction in this study) with 5 items, entrepreneurial intention with 6 items, self-efficacy (labelled entrepreneurial capacity in this study) with 6 items and 1 item that measures capacity for developing new products and services. The Guttman Split-Half Coefficient for entrepreneurial

attraction, entrepreneurial intention and entrepreneurial capacity as reported in this study are .85, .89 and .72 respectively. The questionnaire was administered individually to consenting students and retrieved immediately for analysis.

Analyses and Results

The data collected was analysed based on the stated hypotheses using the t-test for independent samples; and the results are presented as follows:

Hypothesis one which stated that STEM and non-STEM students will not significantly differ in entrepreneurial capacity was analyzed using the t-test for independent samples. The result in **Table 1** revealed that a significant difference exists between STEM and non-STEM students' entrepreneurial capacity. Therefore the hypothesis was not confirmed.

Table 1 showed the mean difference in STEM and non-STEM students' entrepreneurial capacity. The result revealed a significance difference in the entrepreneurial capacity of STEM and non-STEM students [t (199) = 2.30, P<.01] with non-STEM students (□=12.19) having higher entrepreneurial capacity than the STEM students (□=12.13). This means that the non-STEM students displayed higher self-efficacy as regards entrepreneurship than the STEM students.

Table 1: T-test for independent samples showing the difference in STEM and non-STEM students' entrepreneurial capacity

	N	□	SD	df	T	P
STEM	126	12.13	6.924	248	.084	<.01
Non-STEM	124	12.19	5.497			

Hypothesis two which stated that there will be no significant difference in STEM and non-STEM students' entrepreneurial intentions was analyzed using t-test for independent samples. The result in Table 2 revealed that STEM and non-STEM differ significantly in their entrepreneurial intentions. Therefore the hypothesis was not confirmed.

Table 2 showed the mean difference in STEM and non-STEM students' entrepreneurial intention. The result revealed a significance difference in the entrepreneurial intentions of STEM and non-STEM students [t (248) = 2.397, P<.01] with non-STEM students (□=14.79) having higher entrepreneurial capacity than the STEM students (□=12.56). The implication is that the non-STEM students showed greater likelihood to engage in entrepreneurship than the STEM students.

Table 2: T-test for independent samples showing the difference in STEM and non-STEM students' entrepreneurial intention

	N	□	SD	df	T	P
STEM	126	12.56	8.056	248	2.397	<.01
Non-STEM	124	14.79	6.544			

Hypothesis three which stated that STEM and non-STEM students will not significantly differ in capacity for developing new products and services was analyzed using t-test for independent samples. The result in **Table 3** revealed that STEM and non-STEM did not differ significantly in their capacity for developing new products and services. Therefore the hypothesis was confirmed.

Table 3 showed the mean difference in STEM and non-STEM students' capacity for developing new products and services. The result revealed no significance difference in the STEM and non-STEM students' capacity for developing new products and services [t (248) = 1.387, P>.05]. This implies that STEM and non-STEM students showed similarity in their capacity for developing new products and services.

Table 3: T-test for independent samples showing the difference in STEM and non-STEM students' capacity for developing new products and services

	N	□	SD	df	T	P
STEM	126	2.61	1.368	248	1.387	>.05
Non-STEM	124	2.36	1.461			

Hypothesis four which stated that here will be no significant difference in STEM and non-STEM students' entrepreneurial attraction was analyzed using t-test for independent samples. The result in Table 4 revealed that STEM and non-STEM did not differ significantly in their entrepreneurial attraction. Therefore the hypothesis was confirmed.

Table 4 showed the mean difference in STEM and non-STEM students' entrepreneurial attraction. The result revealed no significance difference in the entrepreneurial attraction of STEM and non-STEM students [t (248) = 1.296, P>.05]. This means that STEM and non-STEM students were alike in their attraction to entrepreneurship.

Table 4: T-test for independent samples showing the difference in STEM and non-STEM students' attraction to entrepreneurship

	N	□	SD	df	T	P
Public	126	13.22	5.493	248	1.296	>.05
Private	124	13.44	4.923			

The results in **Tables 1- 4** showed that STEM and non-STEM students differ significantly in entrepreneurial capacity and entrepreneurial intentions with the non-STEM rating higher on both dimensions. Furthermore, the results showed similarities in STEM and non-STEM students' attraction to entrepreneurship and capacity for developing new products and services. Although both categories of students were similar in their creative abilities and attraction to entrepreneurship, the non-STEM displayed higher capacity and willingness to engage in entrepreneurship than the STEM students.

Discussion

The results of this study revealed that STEM and non-STEM students have similarities in their creative abilities and attraction to entrepreneurship but the non-STEM were better disposed to entrepreneurship than the STEM students. Similarly, Dizik (2017) found that STEM students were lower in entrepreneurial intention when compared with their Business-school counterparts in the same entrepreneurship class. Entrepreneurship is traditionally of business origin, so the business and other non-STEM students are quite familiar with this concept, which may explain the higher inclination of the non-STEM students to entrepreneurship. According to Sharma and Pankaj (2014), business related courses include some aspects of entrepreneurship; and this familiarity may be responsible for their superior entrepreneurial intention when compared with the STEM students.

Conversely, Godwyn (2017) found no link between students' familiarity with the entrepreneurship concept and their disposition towards it. According to Krueger, *et al.* (2000), beyond prior exposure to entrepreneurial courses, situation and person variables are strong determinants of entrepreneurial attitudes and intentions. Intelligence may be considered to play a key role in STEM students' entrepreneurial intentions. This is because many gifted students in the STEM disciplines are mostly lured into paid employment by big multinational companies. Many of these organisations participate in career fairs and recruit these students even before their final examinations at the University.

Bicer, *et al.* (2015) have placed STEM discipline at the topmost of global priorities for competiveness and economic sustainability. This and related reasons have made STEM students to assume superiority over their non-STEM counterparts and are mostly not keen on entrepreneurship education and practices when taught alongside their non -STEM counterparts. To this end, Dizik (2017) explained that the context of entrepreneurial education also affects the entrepreneurial intentions of STEM students.

Conclusion and Recommendation

Entrepreneurship has been described as the solution to the problem of unemployment and economic downturns currently threatening virtually all nations of the world (Faria, Cuestas and Mourelle, 2010). Iakovleva, Kolvereid and Stephan (2011) asserted that developing nations require concentrated efforts at promoting entrepreneurial education at all levels in order to achieve economic sustainability. This has led to researches at the Ivory Towers to inculcate entrepreneurship in the students at the different levels of education and across disciplines.

This study concluded that STEM and non-STEM students both have potentials for successful entrepreneurial engagements but the non-STEM displayed greater likelihood of engaging in entrepreneurship. This study further concluded that the reason the STEM students did not seem very keen on entrepreneurship may include intellectual grandiosity, teaching approach, and opportunity for high-paying employment, economic, social and political situation in the country among others.

This study therefore recommended that STEM-tailored entrepreneurship courses should be made available to STEM students and the facilitators should also be from the STEM field. Successful entrepreneurs can also be invited to facilitate and mentor these potential STEM entrepreneurs. Also, while it is a known fact that the 21st century is marked by technological revolution that affects all aspects of human endeavor, the non-STEM disciplines should not be relegated to the background but rather should be kept abreast of evolving technologies so as to spread their application in all areas of human endeavours for sustained relevance in the global context.

Acknowledgements

The authors of this paper acknowledge the payment of the publication fee of this conference paper by the Covenant University Centre for Research and Innovation Discovery (CUCRID).

References

Bicer, A., Navruz, B., Capraro, R. M., Capraro, M. M., Oner, T & Boedeker, P. (2015). STEM schools vs. non-STEM schools: Comparing students' mathematics growth rate on high-stakes test performance. *International Journal on New Trends in Education and Their Implications*, 6 (1), 138-150.

Boissin, J.P., Favre-Bonté, V & Fine-Falcy S. (2017). Diverse impacts of the determinants of entrepreneurial intention: three sub-models, three student profiles. *Revue de l'Entrepreneuriat*, 16 (3), 17-43.

Dizik, A. (2017). STEM Students Shortchanged in Entrepreneurship Classes. The Wall Street Journal. Retrieved from https://www.wsj.com/articles/stem-students-shortchanged-in-entrepreneurship-classes-1511751600.

Faria J, Cuestas J, Mourelle E (2010) Entrepreneurship and unemployment: a nonlinear bidirectional causality? *Economic Modelling*, 27, 1282-1291.

Fiore, E., Sansone, G., and Paolucci, E. (2019). Entrepreneurship Education in a Multidisciplinary Environment: Evidence from an Entrepreneurship Programme Held in Turin. *Administrative Sciences*, 9(28), 1-28. doi:10.3390/admsci9010028

Godwyn, K.J. (2017). Underrepresented Entrepreneurship: A Mixed Method Study Evaluating Postsecondary Persistence Approaches for Minorities in Science Technology Engineering Math (STEM) to Graduate Studies and STEM Entrepreneurship Education. ProQuest LLC, Ph.D. Dissertation, Cardinal Stritch University.

Hamod D (2010) Cultivating the entrepreneurial ecosystem in Saudi Arabia. *US-Arab Tradeline*, XVII spring pp1-3.

Hou F, Su Y, Lu M & Qi M (2019) Model of the Entrepreneurial Intention of University Students in the Pearl River Delta of China. *Frontiers in Psychology*, 10:916. doi: 10.3389/fpsyg.2019.00916.

Iakovleva, T., Kolvereid, L. & Stephan, U. (2011), "Entrepreneurial intentions in developing and developed countries". *Education + Training*, 53(5), 353-370. https://doi.org/10.1108/00400911111147686

Krueger, N. F., Reilly, M. D., and Carsrud, A. L. (2000). Competing models of entrepreneurial intentions. *Journal of Business Venturing*. 15, 411–432. doi: 10.1016/s0883-9026(98)00033-0

Liñán, F., Rodríguez-Cohard, J. C. & Rueda-Cantuche, J. M. (2011). Factors affecting entrepreneurial intention levels: a role for education. *International Entrepreneurship and Management Journal,* 7:195–218 doi 10.1007/s11365-010-0154-z

Miller, K.T (2011). STEM: An Entrepreneurial Approach. Quality approaches in higher education, 2(2), 5-7.

Omonijo, D. O., Adetola, O. B.., Lawal A. S., Odukoya, J. A. Olowookere, E. I., Okunlola O. B and Rotimi, O. A. (2019). Exploring Entrepreneurial Theories in The Study Of Igbo Business Mentoring (Nwa Boy), South-East Nigeria. Accepted in The International Business Information Management Conference (33rd IBIMA) Seville, Spain, April 15-16, 2019.

Omonijo D. O., Anyaegbunam, M. C., Adeleke, V. A., Nnatu, O. B., Ejor, S., Oluwunmi, A. O., Olowooere, E. I and Agubo, C. (2019). The Review of the Student Industrial Work Experience Scheme (SIWES) in Four Selected Countries. *Academic Journal of Interdisciplinary Studies*, 8(3). In Press

Oxford Learner's Dictionary (2019). The Definition of Entrepreneurship. Retrieved from https://www.oxfordlearnersdictionaries.com/definition/english/entrepreneurship

Saiden, T. (2017). Towards an entrepreneurship and STEM education primary school curriculum in Zimbabwe: A case study of Bumburwi of Gweru district. *Advances in Social Sciences Research Journal*, 4(18), 148-159.

Sharma, L. & Pankaj M. (2014). Effect of individual factors on youth entrepreneurship – a study of Uttarakhand state, India. Journal of Global Entrepreneurship Research 4 (3). Retrieved from https://journal-jger.springeropen.com/articles/10.1186/2251-7316-2-3

Yusuf N, Albanawi NI (2016). The Role of Entrepreneurship in Economic Development in Saudi Arabia. Bus Eco J 7: 204. doi:http:// dx.doi.org/10.4172/2151-6219. 1000204