

Entrepreneurship Education and Venture Intention of Female Engineering Students in A Nigerian University

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Abstract

The significant changes taking place in the world have offered new opportunities for male and female-owned businesses. This study investigated the impact of entrepreneurship education and venture intention of female engineering students in Nigeria. A descriptive research design was used. Copies of the questionnaire were distributed to collect quantitative data on the link between entrepreneurship education and venture intentions of Landmark university female engineering students. The sample size for this study was determined based on the entire population of 32. This study used purposive random sampling techniques for the selection of the respondent. Hence, each participant was given an equal chance of being chosen from the population in no particular order. Regression analysis was used to analyse the stated hypotheses through a statistical package for social science (SPSS). The findings revealed that effective implementation of entrepreneurship education elements stimulate students' entrepreneurial activities, particularly among female engineering students. This study advanced knowledge and concluded that entrepreneurship education elements such as pedagogy, educators' competence, and learning environment have a significant impact on venture intention.

Keywords: entrepreneurship, pedagogy, female entrepreneurship, venture intention, engineering, curriculum content

1. Introduction

The country's economic strength and prosperity is determined by the creativity and innovation of its people. While many institutions of higher learning are focusing their attention on training and producing a highly competent workforce, Universities with engineering departments are challenged to motivate their students to work hard towards identifying societal needs and transform their technical and entrepreneurial competencies into commercializable products and services (Badri & Hachicha, 2019). In line with this, engineering students participate in entrepreneurship programmes that expose them to business skills that inspire the expression of entrepreneurial potentials, critical thinking, and actions (Igwe et al., 2019). However, women participation in entrepreneurial activities is a growing phenomenon globally (Zahra & Wright, 2016; Martinez Dy & Marlow, 2018). It accounts for the creation of economic and social values such as job creation, growth, and women empowerment (McMullen & Warnick, 2016). Despite its benefits, women participation in entrepreneurship is low in most developing countries due to the socio-cultural pressures (Jamali, 2009).

Nigeria has been plagued with rising graduate unemployment and underemployment among other social problems (Onuma, 2016). And most graduates are not equipped with basic entrepreneurial skills to venture into businesses. In response to this problem, education stakeholders enacted policies on education, revitalizing entrepreneurship education to address the nagging problem of graduate unemployment and made it compulsory for all tertiary institutions in Nigeria. The Federal Ministry of Education mandated a policy on the addition of entrepreneurship education in the curricula of tertiary institutions in the Nation. Entrepreneurship education has become imperative in institutions of higher learning in the Nation because it offers a genuine and practicable methodology to resolving the prevalent problem of joblessness (Gabadeen & Raimi 2012; Jena, 2020). The overall aim of entrepreneurship education policy in Nigerian tertiary institutions is to nurture entrepreneurship culture among students and faculty for both educating and supporting the establishment of business ventures (Yahaya, 2011 cited in Gabadeen & Raimi, 2012; Oguntimehin, 2018; Ogbari et al. 2018).

Therefore, this suggests that entrepreneurship education in Nigerian tertiary institutions is introduced to empower students with entrepreneurial expertise that would motivate students to be job inventors and not job seekers. Despite this move, the craving for white-collar jobs has persisted. Similarly, the low participation of females in an engineering field, gender inequality, and family factors (marriage and child-rearing) are major factors that constituted a stumbling block to female entrepreneurship in the engineering field (Parker, 2018; Raimi et al, 2015). This study purposes to examine the impact of entrepreneurship education on venture intention female engineering students.

Literature Review

Female Entrepreneurship

Fostering female entrepreneurship has been recognized as one of the major ways to boost the level of entrepreneurship and achieve economic prosperity (Jena, 2020). The major motivation for focusing on female entrepreneurship is attributed to the increasing awareness of the vital role played in starting, running, and growing businesses that have a profound impact on economic growth. Existing literature indicates that the motivation to actively participate in entrepreneurial ventures is similar for male and female. Such motivation is encapsulated in the desire to be independent and a need for achievement (Buttner, 1993; Orhan & Scott, 2001; Orhan 2001; Ahmed et al., 2020). Also, Gosselin and Grisé (1990) posit that the desire for independence is one of the main reasons cited by female entrepreneurs globally for launching their own business. However, Adeyeye (2017) highlighted the recognition of opportunity and the desire to invent, extend an existing product, adopting and adapting an existing concept and synthesis as the approach for venture intentions (market innovation). While the drive for entrepreneurship in some women is rooted in negative environments, others are motivated by positive opportunities (Goby & Eroglu, 2011). Education on entrepreneurship plays a key role in the development of an individual's skills and competencies (Dou et al., 2019). And it is recognized by scholars and policymakers globally (Almeida et al., 2019).

In this light, female entrepreneurs are a bundle of untapped resources that can be explored not only as a solution to the nagging problem of unemployment but also to leverage on their latent contribution to economic wealth and prosperity (Badri and Hachicha, 2019). In the Nigerian context, cultural limitations and traditional mindsets serve as bottlenecks to starting and running female-owned businesses. The emphasis put on cultural boundaries like the male/female role classifications that tag women as characteristically inferior to men, particularly in the rural context where female entrepreneurs are often not valued. Although, a number of women have very low appetite for risk and entrepreneurial pursuit because entrepreneurial activities are meant for men only, due to risks and demands associated with it (Mwobobia, 2012). According to Ibidunni et al. (2018), gender, age, and educational qualifications are determinants of entrepreneurship's ability to develop new products. Ismail et al., (2015) reveal that entrepreneurial intention and orientation have a key impact on the commercialization of research. However, the major problem confronting female entrepreneurs highlighted by (Ahmed et al.; Ahmad 2011) is the absence of networking between female entrepreneurs and other entrepreneurial associations that provide them access to business training and competences due to time constraint arising from family responsibilities, thus limiting female entrepreneurs for giving expression to their full potentials (Moses & Amalu, 2010).

Feminism Theory

The liberal feminism theory as noted by DeMartino and Barbato, (2003) assumes that men and women should express their political, economic and social aspirations equally. Therefore, rationality and not sex should be used as a parameter for an individual right. Although the theory can be subclassified into various theories; liberal feminism theory, cultural feminism, social feminism theory, amazon feminism, and separatist's theories. This study focuses on liberal feminism theory because of several limitations confronted by female entrepreneurs within the Nigerian business environment.

The liberal feminism theory is rooted in the notion of equality, entitlement, and individual rights. It recognizes that in the context of entrepreneurship if women are exposed to the various opportunities such as education, business skills, work experience, and other resources available to men in the society, they will perform similarly (Unger & Crawford, 1992). This gives us a compelling argument on the reasons why SME sub-sector in Nigerian are dominated by women who operate at subsistence level.

2. Methodology

Study Area

Landmark University is a private Christian mission tertiary institution situated in Omu-Aran, Kwara State. It boasts of over 4000 students. Landmark University (LMU) offers courses and programs leading to officially recognized tertiary education degrees such as bachelor's degrees, master's degrees, and doctorate degrees in numerous areas of study.

The study adopts a descriptive approach so as to obtain students' opinion on the effect of entrepreneurship education on the venture intention of female engineering students in Nigeria. A descriptive research design was adopted because it captures relevant information regarding current practices on the subject matter. Quantitative data was collected on the link between entrepreneurship education and venture intentions of Landmark University female engineering students through the distribution of questionnaire. The authors choose to examine the whole population since the size has a homogenous set of features (female core engineering undergraduates) which is typically very small. The questionnaire was partitioned in two major sections; the first section captures the respondents' demographic characteristics; while the second section contains the measurement indices for the independent (entrepreneurship education), and dependent (venture intention) variables. A Likert- scale questions starting from strongly agree to strongly disagree was used (strongly agree=5, agree=4, undecided=3, disagree=2, strongly disagree=1).

Partial Least Squares Structural Equation Modelling PLS-SEM which is used for small sample size (less than 50) and non-normal data as proposed by Jannoo et al., (2014) was adopted for the analysis of data generated from the distributed questionnaire. Descriptive and inferential statistics were used to present the results of the study. A sample of 32 respondents was targeted from which all respondents filled in and reverted the questionnaires. This response rate was satisfactory to make conclusions for the study as it is a representation of the population. The study was conducted from 20/02/2018 to 15/07/2019.

Operationalization of the Research Variables

The impact of entrepreneurship education and venture intention of female engineering students is operationalized mathematically as follows:

$$Y = f(X)$$

Where Y is a dependent variable, f is a function and X is an independent variable

Therefore,

$$Y = \text{Venture Intention (VI)}$$

$$X = \text{Entrepreneurship Education (EE)}$$

$$Y = \text{VI} = (y_1, y_2, y_3 \dots y_n)$$

$$Y_1 = \text{Critical Thinking}$$

$$Y_2 = \text{Innovation}$$

$$Y_3 = \text{Opportunity Identification}$$

$$X = \text{EE} = (x_1, x_2, x_3 \dots x_n)$$

$$X_1 = \text{University Learning Environment}$$

$$X_2 = \text{Curriculum Content}$$

$$X_3 = \text{Educator's Competence}$$

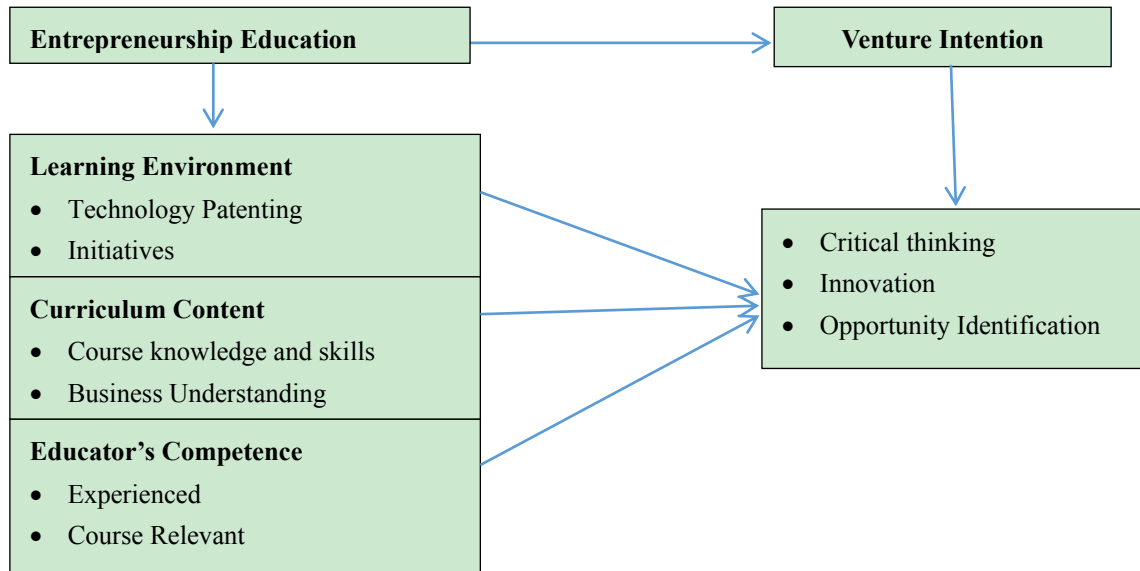


Figure 1.

Conceptual Framework

3. Results

Table 1. Demographic Information of respondents

Category	Frequency	Percentage
Departments		
Agric & Biosystem	3	9.4
Chemical	8	25
Civil	9	28.1
Electrical & Information	9	28.1
Mechanical	3	9.4
Total	32	100.0

As indicated in table 1 above, majority of the respondents as shown by 28.1% were in Civil engineering and Electrical and Information department, followed by Chemical, Mechanical and Agric and Biosystems accordingly. The result of the standard deviation and the Mean imply rational distribution.

Table 2. Entrepreneurship Course Development

Curriculum Contents	Statistics	
	Mean	Std. Deviation
course develop entrepreneurial understanding	3.78	1.039
course develop entrepreneurial knowledge and skills	3.81	.965
course raise entrepreneurship interest	3.94	1.076
Educator's Competence		
experience and competent instructors	3.97	.897
relevant course	4.06	.716
interest stimulation	3.97	.647
Learning environment		
promotion of technology patenting and commercialization	3.44	1.162
entrepreneurship fostering	3.38	1.100
entrepreneurship seed funding	3.22	1.128
Critical thinking		
develop ideas on existing business problems	3.97	.897
develop ideas to improve existing products	3.97	.740
develop new product ideas	4.13	.793

Opportunity Identification		
identify entrepreneurship needs	3.94	.801
discover skills in business opportunities	4.03	.861
identify several businesses opportunities	3.81	.859
Innovation		
develop new products	3.59	1.012
develop new technologies processes	3.47	1.047
develop new business processes	3.84	1.051

Table 2, indicates that majority of the respondents agree that Landmark University entrepreneurship programmes provide courses that are consistent with the elements of the independent variable such as (**Curriculum Contents**), (**Educator's Competence and Learning environment**) and elements of dependent variable (critical thinking, opportunity identification and innovation)

Content Validity

The content validity of the work is determined by deleting any items with a low factor loading less than 0.5 and retain the one above 0.5

Table 3. Content Validity

Item/ Construct	Critical Thinking	Curriculum Content	Educator's Competence	Innovation	Learning Environment	Opportunity Identification
CC1		0.605				
CC2		0.846				
CC3		0.769				
CT1	0.913					
CT2	0.817					
CT3	0.654					
EC1			0.765			
EC2			0.833			
EC3			0.785			
INV1				0.736		
INV2				0.874		
INV3				0.671		
LE1					0.752	
LE2					0.902	
LE3					0.696	
OP1						0.709
OP2						0.827
OP3						0.841

CC: Curriculum Content; CT: Critical Thinking; EC: Educator's Competence; INV: Innovation; LE: Learning Environment; OP: Opportunity Identification

The Prediction Quality of the Model

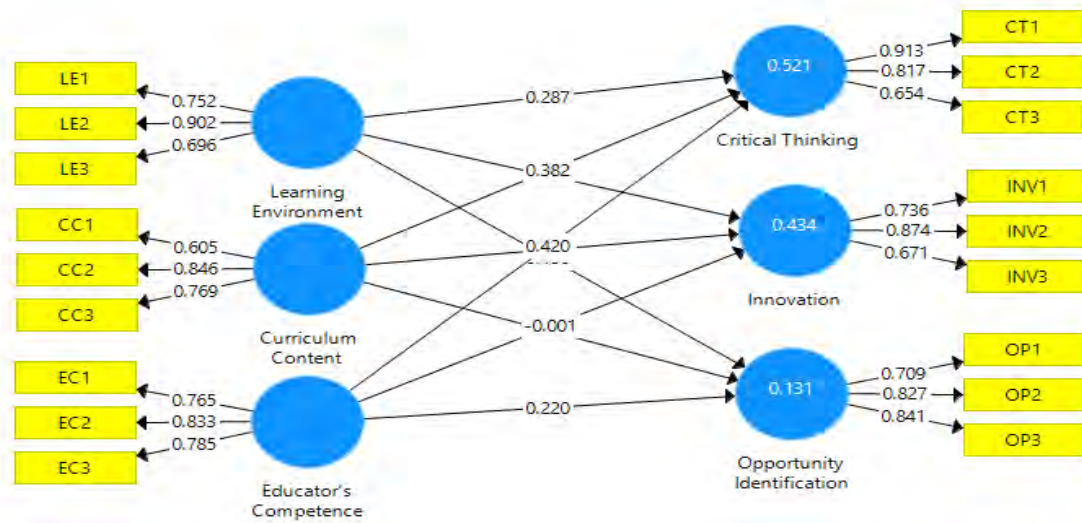


Figure 2. Path Model and Algorithm

Table 4. Convergence Validity

Construct	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Critical Thinking	0.733	0.866	0.841	0.643
Curriculum Content	0.604	0.654	0.788	0.558
Educator's Competence	0.713	0.722	0.837	0.632
Innovation	0.643	0.681	0.807	0.586
Learning Environment	0.708	0.845	0.830	0.621
Opportunity Identification	0.753	0.753	0.836	0.631

As shown in Table 4, to access the convergent validity, analysis of the factors loading, of Composite reliability (CR), and the average variance extracted (AVE) were simultaneously used. All the factors loading have a The AVE is from 0.5 to 0.6 which indicate full degree of construct validity of the criteria is accepted and used. The convergent validity indicates that all factors loading were significant at 0.01.

Discriminant Validity

To support the construct validity of the outer model, it was essential to establish the discriminant validity.

Discriminant Validity Matrix

Table 5. Fornell-Larcker Criterion

Construct	Critical Thinking	Curriculum Content	Educator's Competence	Innovation	Learning Environment	Opportunity Identification
Critical Thinking	0.802					
Curriculum Content	0.425	0.747				
Educator's Competence	0.597	0.204	0.795			
Innovation	0.494	0.658	0.145	0.765		
Learning Environment	0.377	-0.146	0.348	-0.067	0.788	
Opportunity Identification	0.507	0.196	0.307	0.317	0.201	0.794

Table 6. The coefficient of determination

Coefficient of determination	R Square	R Square Adjusted
Critical Thinking	0.521	0.470
Innovation	0.434	0.373
Opportunity Identification	0.131	0.038

The coefficient of determination results reflects that our R² is moderate for critical thinking and Innovation why it is weak for opportunity identification in the usefulness of a regression model as shown in Table 6 and Figure 2

Entrepreneurial venture intention is a formative construct in the PLS path model and it is assessed for validity for Collinearity issue and significance and relevance of indicators (by checking outer weights and outer loadings).

Table 7.

Collinearity Statistics (VIF)	
	Outer VIF Values
	VIF
CC1	1.119
CC2	1.302
CC3	1.300
CT1	1.670
CT2	1.557
CT3	1.306
EC1	1.598
EC2	1.731
EC3	1.231
INV1	1.512
INV2	1.624
INV3	1.125
LE1	1.447
LE2	1.496
LE3	1.283
OP1	2.320
OP2	2.410
OP3	1.202

Collinearity Issue: All indicators of have a VIF value < 5 as shown in Table 4.7. Hence, there is no collinearity issue present between the indicators.

Assessing the relevance and significance of the structural model relationships

Table 8. Relevance and Significance of Path Co-efficient

Variables	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Values
Curriculum Content -> Critical Thinking	0.382	0.354	0.147	2.590	0.010
Curriculum Content -> Innovation	0.663	0.648	0.160	4.132	0.000
Curriculum Content -> Opportunity Identification	0.173	0.216	0.223	0.775	0.439
Educator's Competence -> Critical Thinking	0.420	0.437	0.156	2.683	0.008

Educator's Competence -> Innovation	-0.001	0.006	0.181	0.004	0.997
Educator's Competence -> Opportunity Identification	0.220	0.134	0.309	0.710	0.478
Learning Environment -> Critical Thinking	0.287	0.265	0.157	1.829	0.068
Learning Environment -> Innovation	0.030	0.029	0.220	0.137	0.891
Learning Environment -> Opportunity Identification	0.150	0.115	0.303	0.494	0.622

***: $p < 0.001$; **: $p < 0.01$; *: $p < 0.05$.

Table 8, denote the strength of the relationships amongst all variables of Entrepreneurial Education (Curriculum content, Educator's competence and learning environment) and venture intention (Critical thinking, opportunity identification and innovation), and to verify whether these relationships among them.

Path Coefficient Model

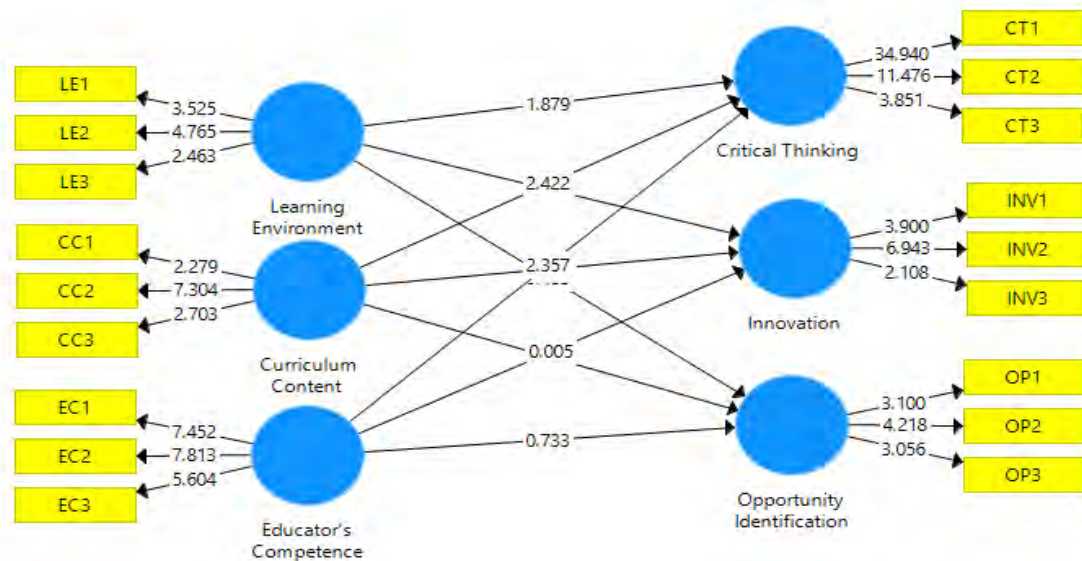


Figure 3.

Figure 3 indicated that curriculum content and critical thinking, ($\beta = 0.382$, $t = 2.59$, $p > 0.01$). Curriculum Content and Innovation, ($\beta = 0.663$, $t = 4.132$, $p > 0.000$). Educator's Competence and Critical Thinking, ($\beta = 0.420$, $t = 2.683$, $p > 0.008$) well-related show paths are related.

The results, on the other hand, show that Curriculum Content and Opportunity identification, ($\beta = 0.173$, $t = 0.775$, $p > 0.439$) Educator's Competence and Innovation, ($\beta = -0.001$, $t = 0.004$, $p > 0.997$) Educator's Competence and Opportunity Identification, ($\beta = 0.220$, $t = 0.710$, $p > 0.478$) Learning Environment and Critical Thinking, ($\beta = 0.287$, $t = 1.829$, $p > 0.068$), Learning Environment and Innovation, ($\beta = 0.030$, $t = 0.137$, $p > 0.891$) and Learning Environment and Opportunity Identification ($\beta = 0.150$, $t = 0.494$, $p > 0.622$), are not well related.

4. Discussion

The result revealed that the curriculum for entrepreneurship programmes stimulate and enables students to think critically by developing novel business ideas. However, the practical aspect of the entrepreneurship education is weak. This is validated by the studies of (Unger & Crawford, 1992), who revealed lack of understanding of entrepreneurship education as a major barrier affecting the effective delivery of entrepreneurship education in Tertiary Institutions. This is also supported by the findings of (Römer-Paakkanen & Pekkala, 2008; Ogbari et al, 2018), which stated that students who are interested in launching a business, should be encouraged to do so.

Another finding indicated that the use of effective pedagogy in entrepreneurship accelerate the evolution of business start-ups, by inspiring students' interest through teaching practices that are action-based. But, the absence of the combination of theoretical and practical approaches may frustrate the expression of enterprise potentials by female engineering students. This is corroborated with the finding of (Keat, Selvarajah, & Meyer, 2011), which shows that class activities dominated by theory is demotivating and diminishes interest and focus. This is also supported by the postulation of (Olokundun, et al., 2017; Moses & Amalu, 2010; Badri and Hachicha, 2019), which shows that the absence of the right blend of theoretical and practical experience in the classroom that does not offer real-world experience to students make learning a boring experience.

The study suggested that entrepreneurial competencies of educators stimulate students to develop the intention to launch a business in their field of study upon graduation. However, some of the educators are inadequately equipped with cutting edge knowledge to deliver entrepreneurship courses effectively. This is in line with the study of Ibidunni, et al., (2017), who advanced that there is a scarcity of educators with entrepreneurial competence. This suggests those who are teaching entrepreneurship classes need relevant training to acquire skills and experience to deliver core entrepreneurship courses.

5. Conclusion

This study indicates that the curriculum contents for entrepreneurship programmes stimulate students to think critically by developing novel business ideas. However, the practical aspect of entrepreneurship education is weak, while the emphasis is placed on the acquisition of vocational skills as against the development of entrepreneurial competencies.

Also, valid evidence indicates that the employment of effective pedagogy in entrepreneurship accelerates the evolution of business start-ups, by inspiring students' interest through teaching practices that are action-based. But, the absence of the combination theoretical and practical approach may frustrate the expression of enterprise potentials by female engineering students.

Besides, there are abundant evidences to suggest that the entrepreneurial competencies of educators stimulate students to develop the intention to launch a business in their field of study upon graduation. However, some of the educators need to be empowered through training on the used cutting edge approaches to deliver entrepreneurship courses effectively.

Another valid inference evident in this study is that the university's' learning environment offers experiences such as entrepreneurship mentoring and seed funding, which is considered suitable for innovations. However, these supports need to be introduced early enough to boost entrepreneurial activities.

6. Recommendations and Policy Implication

I. One major recommendation is that the entrepreneurship curriculum should extensively put emphasis on social entrepreneurship, critical thinking focusing on the societal benefits of cultivating innovative and entrepreneurial solutions. Participation by students during business idea generation exercises should be intentional and accorded major priority. Also, female engineering must be encouraged to be collaborating with other women. This is important because being part of networks and communicating with others is relevant to helping women develop the confidence to start their own business.

II. The engagement of guest speakers, individual and group project with entrepreneurial competences, is very germane to stimulating students' interest in launching start-ups.

III. Policymakers should partner with training institutions and ensure that entrepreneurship educators are adequately trained to develop the relevant enterprise skill that will inspire commitment from students to value, embrace business plan writing, and development of business canvas. Business plan writing and development of business canvas should be considered a requirement for graduation. This idea is predicated on the fact many investors and other stakeholder support systems are favorable dispose to business plan competitions as a basis to provide financial support to start-ups.

7. Significance of Statement

This study discovers that practical approach to entrepreneurship education with a specific focus on students' field of study thus, creating an enthusiasm in them to apply such skills on graduation. Therefore, the result will be beneficial to managements in higher institutions to formulate and implement policies that will encourage female engineering undergraduates' engagement in innovative ventures as well as entrepreneurial development in Nigerian higher institutions.

The study also indicates that the engagement of guest speakers, individual and group projects with entrepreneurial competencies, is very germane to stimulating the development of female entrepreneurial skills. This will support the review of the policy that will inspire the propensity of students to create jobs and to reduce unemployment among them.

Also, this study will add to the existing body of knowledge in entrepreneurship education, by developing a venture intention model which will be helpful for researchers in undertaking further research in other related areas of study.

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