

## Determinants of Science Technology, Engineering and Mathematics (STEM) Undergraduate University Students' Entrepreneurship Behavioural Intention

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### ABSTRACT

Global unemployment is rising and will continue to undermine the socio-economic development of individual nations. Therefore, entrepreneurship is seen as a vital instrument that engenders employment, innovativeness, and sustainable development. This study investigated the determinants of Science Technology, Engineering and Mathematics (STEM) undergraduate students' entrepreneurship behavioural intention in Nigeria. The correlational research design was adopted. The population of the study are all Final year undergraduates STEM students in Niger State Nigeria. The sample size was made up of 240 respondents who were selected using simple random sampling. Questionnaires on the perception of respondents on entrepreneurship education, government support and entrepreneurship intention were used for data collection. Using Cronbach Alpha, the instrument yielded a reliability coefficient of 0.72, 0.76 and 0.74, respectively. The findings of the study indicated that entrepreneurship education and government support are predictors of entrepreneurship intention among STEM university undergraduates' final year students. Gender does not significantly impact the entrepreneurship intention of the respondents in this population. This study has contributed empirical evidence of the critical elements that should influence STEM students' intention to start an enterprise or business and become an entrepreneur. The implication of this study to the field of study is the university and government should motivate STEM graduates to start a business through the provision of incentives. It was recommended that the Federal and State Governments should do more to provide adequate government support for young graduates to engage in entrepreneurship.

**Keywords:** Entrepreneurship Education, Government Support, Entrepreneurship Intention, Gender

### INTRODUCTION

Globally, the educational system of many nations is undergoing noteworthy changes with the implementation of policies that will make individuals self-reliant with the push for the implementation of entrepreneurship education. Therefore, the need to solve the problem of unemployment, grow the economy and raise self-reliant individual has necessitated governments to turn to entrepreneurship. Literature has highlighted the critical role of entrepreneurship to includes poverty reduction, employment, and economic empowerment (Hatak et al, 2014; Israr & Saleem, 2018; Neneh, 2014). Therefore, entrepreneurs are seen as drivers of innovative ideas that will eventually contribute to national economic and technological growth. Every individual requires entrepreneurship skills and education in the 21<sup>st</sup>-century because entrepreneurship skills and disposition are like the survival skills of the 21<sup>st</sup>-century (Zhao, 2012). It is important to highlight that helping students develop entrepreneurship intention or mindset is not only about starting a business and creating jobs but a life-long survival skill for a global economy that is dynamic and evolving. Therefore, 21<sup>st</sup>-century skills such as creative, critical thinking, innovative and problem-solving skills are associated with entrepreneurship and are some of the objectives of STEM.

Nevertheless, considering the critical role of entrepreneurship in the economic development and self-reliance of a nation, there seem to be limited research on the subject matter (Cera et al, 2020; Karimi et al, 2014), especially

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in developing countries like Nigeria (Karimi et al., 2014). In support of this, there are calls for more research to highlight the determinants of entrepreneurship intention. In Nigeria, the government through various government establishments have introduced policies through support agencies such as; the National Poverty Eradication Programme (NAPEP), National Directorate for Employment (NDE), Bank of Industry (BOI), Small and Medium Enterprises Development Agency of Nigeria (SMEDAN), Industrial Development Centre (IDC), Raw Materials & Development Council (RMRDC), and National Office for Technology Acquisition and Promotion (NOTAP), among others. These agencies are established to facilitate the establishment of small scale enterprises, they are also saddled with the responsibility of ensuring a conducive environment for Small and Medium Enterprises (SMEs). Others include poverty alleviation, provide financial support for SMEs, and addressing the problem of unemployment among Nigerian citizens (Akhueomonkhan, et al, 2013; Oseni, 2017). To what extent has the perception of STEM university undergraduate students on these government agencies influence their entrepreneurship intention is left to be seen.

In the 21<sup>st</sup>-century, STEM skills are the essential skills that drive innovation. However, it is not enough for Science, Technology, Engineering or Mathematics (STEM) undergraduates to just possess innovative and technical skills to produce new products. In today's competitive world, it is expected that STEM graduates possess an entrepreneurship mindset. In support of this, Strimel et al, (2019) advocated for the integration of entrepreneurship thinking programme or education among STEM students. They observed that the entrepreneurship mindset or intention is one of the STEM graduate essential skills. STEM undergraduates' students are individuals studying either science, technology, engineering, or mathematics. In recognition of the significant role of entrepreneurship, the federal government of Nigeria has introduced entrepreneurship education as a general course for all students. This is a view to engendering an entrepreneurship mindset among students. The intent among others is to equip the students with the necessary skills and stir up their intention to be entrepreneurs. It was reported that the importance of entrepreneurship education in the university is to enhance the students' entrepreneurship attitudes and mindset (Fayolle & Gailly, 2015). This will be more vital for STEM students because STEM skills drive innovation and enhance economic development.

Nevertheless, the intention of STEM undergraduate intention to be entrepreneurs has not been extensive research given the strategic role of entrepreneurship in the social and economic development of a nation. Therefore, findings could provide useful information to help the government and policymakers to provide appropriate solutions to enhance entrepreneurship among young graduates. Gender is the biological difference between men and women, it is the division of humans based on sex. It has been reported that gender influence individual perception and academic achievement. A gap exists in gender studies in science, technology, engineering, and mathematics, hence gender is considered as a moderating variable in this study. Given the preceding, it is pertinent to identify factors such as entrepreneurship education, that impact undergraduate students' intentions to start a business.

This study is supported by the theory of planned behaviour Ajzen, this theory is widely used to predict and explain a wide range of people's behaviours and intentions. Ajzen (1991) postulates that any planned behaviour is preceded and can be better predicted from the intention to perform that behaviour. The intention to perform a given planned behaviour is reinforced or moderated by three vital attributes which include: the individual disposition to the act or enterprise; community view of the enterprise favourable or not and individuals' ability or aptitudes to perform or engage in the enterprise. The theory implies that entrepreneurial intention or attitudes are influenced by an individual's expected values, which is the perceived benefits of entrepreneurship.

### **Statement of Problem**

Global unemployment is reported to be rising according to the International Labour Organisation (International Labour Organization, 2019) and unemployment will continue to undermine the socio-economic development of individual nations. There is a need to create employment opportunities to minimize the rate of unemployment globally and especially in developing countries such as Nigeria. In Nigeria, 70% of its population is poor and live under the poverty line of \$2 per day and the level of unemployment has risen to 8.5 million in 2017 (National Bureau of Statistics, 2018). The numbers can only be imagined in 2020. The attendants' effects of unemployment include; frustration, trauma, anger, depression, low self-esteem and other social vices (Akwarra, 2013; Herman, 2019). Therefore, entrepreneurship is seen as a vital instrument that engenders employment, innovativeness, and sustainable development. The traditional system of education has inhibited and prevented the development of entrepreneurs because it focuses on memorisation and seems to prepare students for employment instead of creating jobs (Kirkley, 2017)

Hence the government have responded to the demand for entrepreneurship skills and mindset by introducing entrepreneurship course for all students of higher institution irrespective of their course of study. However, the influence of entrepreneurship education and other individual factors on entrepreneurship intention has not been determined. Most literature on the influence of entrepreneurship intention are studies carried out overseas, there

is limited literature on this subject matter which focus on the STEM undergraduates' population. Entrepreneurship education may be more relevant to STEM students because STEM skills are the most sort after in the 21<sup>st</sup> century. This could be because the innovations and global market of the 21<sup>st</sup> century are STEM driven. Given the vital role of STEM graduates in driving innovation and as important human capital for the 21<sup>st</sup>-century global economy. Determining the behavioural intention to engage in entrepreneurship, may yield important data. Hence, the motivation for this study; determinants of science technology engineering and mathematics undergraduate students' entrepreneurship behavioural intention in Nigeria.

As highlighted earlier, entrepreneurs have contributed significantly to the economy, society, humankind, and the world at large. Similarly, entrepreneurship is a critical issue with regards to economic growth and development, it is seen as the engine for wealth and job creation as well as an instrument for revenue generation (Adekiya & Ibrahim, 2016). Entrepreneurial intention is seen as the preparedness of individuals to engage in the act of entrepreneurship or start a new business (Dohse & Walter, 2012). An individual may have the potential to engage in entrepreneurship but may not start a business because they lack such intentions. Therefore, entrepreneurial intention refers to the individual's behavioural intent or state of mind that aimed at starting a new venture (Herman, 2019). The behavioural intention could be a good predictor of individual behaviours, particularly when the behaviour is rare to be observed

Literature has highlighted that entrepreneurship education is an important solution for the creation of employment opportunities for the youth (Okon & Friday, 2015; Oseni, 2017). Hence, entrepreneurship education is the process through which undergraduate students obtain a comprehensive set of skills and competencies that can enhance self-reliance, social and economic opportunities. Entrepreneurship education has been embedded in the Nigerian tertiary institution. Nevertheless, empirical findings on the influence of entrepreneurship education and government support on behavioural intention have not been fully established especially among STEM undergraduate university students.

Potishuk and Kratzer (2017) investigated the factors that impact students' entrepreneurship intent, the findings show that entrepreneurship education is a strong determinant of entrepreneurship intention. Similarly, Cera et al. (2020) and Herman and Stefanescu (2017) separate findings show that entrepreneurship education impacts positively and significantly entrepreneurial activities. On the contrary, other researcher reported that entrepreneurship education is not a good predictor of entrepreneurship intention of the respondents (Ambad & Damita, 2016; Herman, 2019)

Government structural support involves perceiving entrepreneurship structures created by the government and non-governmental constituencies that will emerge entrepreneurship. This support structure includes financial aids and a conducive environment, among others. Some of the support could be in form of tax incentives and funding schemes. In Nigeria, the government have created several agencies with the responsibilities of encouraging and supporting entrepreneurship. Some of the support or assistance includes facilities (business location, shop or shop lot) technical and marketing training and advisory among others. Denanyoh, et al (2015) conducted a study in Ghana and found that government and non-governmental support predicts entrepreneurship intension among college students. On the contrary, in Malaysia, it was found that there was no significant influence of structural supports on entrepreneurship intention (Ambad & Damita, 2016).

Gender of individuals has been linked to academic task and perceptions of the phenomenon and there are gender inequalities in most cultures but diverse degrees. An individual gender could influence his/her perception of entrepreneurship and attitudes or intention towards entrepreneurship. Mostly, males display higher intent towards entrepreneurship than females (Babikova & Bucek, 2019; Çera et al, 2018). Similarly, it was reported that gender has a strong positive impact on individuals' intention towards entrepreneurship (Onyeukwu & Padmavathi, 2019). Given the inconclusiveness of literature, gender is considered a moderating variable (Haus et al, 2013). The findings of this study could narrow the gap in the literature by examining the determinants of Science Technology, Engineering and Mathematics (STEM) undergraduate students' entrepreneurship behavioural intention in Nigeria.

## **Research Questions**

To guide this study, the following questions are stated.

1. What is the influence of children teachers perceive the use of digital technology on their behavioural intention to use digital technology for children instruction?
2. What is the influence of children teachers perceive ease of use of digital technology on their behavioural intention to use digital technology for children instruction?
3. What is the relationship between gender and children teachers' behavioural intention to use digital technology for children instruction?

## **Research Hypotheses**

To achieve the stated objectives, the following research was formulated and tested at 0.05 significant level:

1. There is no significant influence of children teachers perceive the use of digital technology on their behavioural intention to use digital technology for science instruction
2. There is no significant influence of children teachers perceive ease of use of digital technology on their behavioural intention to use digital technology for children instruction
3. There is no significant relationship between gender and children teachers' behavioural intention to use digital technology for children instruction.

## **RESEARCH AND METHOD**

The correlation research design was adopted for this study, The primary data for predictor and criterion variables were collected through an online and face-to-face survey done using a structured questionnaire. a quantitative research approach was adopted. Specifically, correlational design involves the use of a quantitative instrument to gather data (Creswell, 2012). It involves a numerical description of the opinions of respondents on a given phenomenon (digital technology). In this study, the impact of teachers perceived usefulness and ease of use of digital technology-based research was examined.

All final year undergraduates of the faculty of Science, Technology, Engineering, and Mathematics students in Niger State, Nigeria form the population for this study. A multi-stage sampling technique was employed in selecting the respondents for this study. Firstly, all the universities in the population were used for the study. Using simple random sampling 60 final year undergraduates' students were selected from the faculty of science, engineering, technology and mathematics for the study. The sample size was made up of 240, 102 students were female, and 138 were male undergraduate students.

## **Instrument**

The instrument for data collection was a structured questionnaire that was adopted from the literature. The questionnaire is a 5-point Likert- scale of Strongly Agree (SA) Agreed (A) Undecided (U) Disagree (D) and Strongly Disagree (SD) which graded from 5-1. The questionnaire was made up of section A, B, C and D. Section A is made up of respondent demographic data, Section B, is made up of 10 items that sought to determine final year STEM undergraduate's perception of entrepreneurship education. Section C focused on respondents' perception of government support towards entrepreneurship and consist of 10 items. Finally, Section D consists of 10 items that sought to determine respondents' behavioural intention towards entrepreneurship. The predictors have perceived entrepreneurship education and perceive government support, while the criterion variable is perceived behavioural intention to engage in entrepreneurship. The structured questionnaire was validated for face and content by two educational psychologists and an English language expert. The reliability coefficient index of the various construct of the instrument was 0.72, 0.76 and 0.74 using Cronbach alpha. This result is supported by the findings of Sekaran and Bougie (2010) who reported that the reliability coefficient of 0.6 is considered poor, 0.7 is considered acceptable and 0.8 is considered good in the field of education and social science.

Firstly, ethical approval was acquired from the respective university authority to ensure adherence to ethical principles, privacy, confidentiality, and informed consent. The researchers solicited the cooperation of the respondents to encourage objective responses. The researcher assured them that the data would be used strictly for this study. The respondents were briefed on the aim of the study and were encouraged to be very objective in their responses. The researchers administered and collected the completed questionnaires. The data collected were analysed using linear regression to test the formulated hypotheses at a 0.05 level of significance.

## **RESULTS**

To achieve the objectives of this study, the data collected were analysed based on the formulated hypotheses as presented in the next section.

### **Entrepreneurship Education as a Predictor of Entrepreneurship Intention**

To determine the impact of entrepreneurship education on behavioural intention towards entrepreneurship among STEM final year university students, linear regression was employed, and the finding is presented in Table 1

TABLE 1  
Linear Regression Model Summary on Entrepreneurship Education as a Predictor of Entrepreneurship Intention

Model	R	R Square	Adjusted Square	R Estimate	Std. Error of the
1	.754 <sup>a</sup>	.569	.567	5.388	

a. Predictors: (Constant), Entrepreneurship Education

b. Dependent Variable: Entrepreneurship Intention

Table 1 shows the regression coefficient regression for the independent variable entrepreneurship education and criterion variable entrepreneurship intention. The result shows  $r(1,238) = 0.75$ ,  $r^2 = 0.569$ , which shows that entrepreneurship education is a predictor of STEM final year university students entrepreneurship intention. Therefore, hypothesis one is rejected. The  $r^2$  of 0.569, indicates that 57.0% of the total variation in STEM final year university students' entrepreneurship intention was accounted for by the predictor variable (entrepreneurship education). To determine whether the model was a good predictor, regression ANOVA result was presented in Table 2

TABLE 2  
Regression ANOVA on Entrepreneurship Education and Entrepreneurship Intention

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	9115.541	1	9115.541	314.047	.000 <sup>b</sup>
	Residual	6908.193	238	29.026		
	Total	16023.733	239			

a. Dependent Variable: Entrepreneurship Intention

b. Predictors: (Constant), Entrepreneurship Education

Table 2 display ANOVA results. The findings shows that there is a significant difference between the predictor (Entrepreneurship education) and the criterion variables (entrepreneurship intention)  $F(1,238) = 314.047$ ,  $p(0.00) < 0.05$ . Indicating that the model is a good predictor of the impact of entrepreneurship intention or entrepreneurship intent towards starting a business. The regression coefficient indicates that any increase in one unit of entrepreneurship intention will cause an increase in .426 unit of behavioural intention to start a business.

### Government support as a Predictor of Behavioural Intention

To determine the impact of perceiving government support on behavioural intention towards entrepreneurship among STEM final year university students, linear regression was employed, and the finding is presented in Table 3

TABLE 3  
Linear Regression Model Summary on Perceive Government Support as a Predictor of Behavioural Intention towards Entrepreneurship

Model	R	R Square	Adjusted Square	R Estimate	Std. Error of the
1	.344 <sup>a</sup>	.118	.114	7.706	

a. Predictors: (Constant), Government Support

Table 3 shows the regression coefficient regression for the independent variable government support on the criterion variable entrepreneurship intention. The result shows  $r(1,238) = 0.344$ ,  $r^2 = .118$ , which shows that government support is a predictor of STEM final year university students' entrepreneurship intention. Therefore, hypothesis two is rejected. The  $r^2$  of 0.118, indicates that only 12.0% of the total variation in STEM final year university undergraduates, students' entrepreneurship intention was accounted for by the independent variable (government support). To determine whether the model was a good predictor, the ANOVA result was presented in Table 4.

TABLE 4  
Regression ANOVA on Perceive Government Support and Entrepreneurship Intention

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1891.083	1	1891.083	31.847	.000 <sup>b</sup>
	Residual	14132.650	238	59.381		
	Total	16023.733	239			

a. Dependent Variable: Entrepreneurship Intention

b. Predictors: (Constant), Government Support

Table 4 display regression ANOVA results. The findings shows that there is a significant difference between the predictor (government support) and the criterion variable ( $F(1,238) = 31.847$ ,  $p(0.00) < 0.05$ ). Indicating that the model is a good predictor of the impact of government support on behavioural intentions towards engaging in entrepreneurship. The regression coefficient indicates that any increase in one unit of government support will cause an increase in .397 unit of the intention to start an enterprise.

### Relationship between Gender and Behavioural Intention

The relationship between gender and STEM final year university undergraduates' students' entrepreneurship intention was determined using Kendall's Tau B was employed and the result is as presented in Table 5

TABLE 5  
Relationship between Gender and Entrepreneurship Intention

Kendall's Tau_b	Entrepreneurship Intention	Entrepreneurship Intention		Gender
		Correlation Coefficient	Sig. (2-tailed)	
Gender		.	.	.139
		240	240	240
		.081	.139	1.000

Table 5 revealed that there is no significant relationship between gender and entrepreneurship behavioural intention of STEM final year university undergraduates' students. The results show  $r = 0.081$ ,  $p\text{-value} = 0.139$ , which means  $p > 0.05$ , the null hypothesis three is rejected. The correlation coefficient ( $r = 0.081$ ) further shows that there is a weak positive relationship between gender and STEM final year university undergraduates' students' behavioural intention. Hence, gender has no significant influence on respondent behavioural intention to start an enterprise.

### DISCUSSION

The study investigated the determinants of Science Technology, Engineering and Mathematics (STEM) undergraduate university students' entrepreneurship behavioural intention in Nigeria. To achieve the objectives of the study, data was collected and analysed using linear regression. The finding indicated that entrepreneurship education is a positive and significant predictor of (STEM) undergraduate university students' entrepreneurship behavioural intention. 57% of the variance in (STEM) undergraduate university students' entrepreneurship behavioural intention was accounted for by entrepreneurship education. This finding corresponds with Potishuk and Kratzer (2017) who reported that entrepreneurship education is a strong determinant of entrepreneurship intention. Similarly, Cera et al. (2020) and Herman and Stefanescu (2017) separate findings show that entrepreneurship education impacts positively and significantly entrepreneurial activities. This finding however did not agree with (Ambad & Damita, 2016; Herman, 2019) whose report shows that entrepreneurship education does not significantly predict the entrepreneurship intention of the respondents. This outcome can be attributed to their exposure of the respondents to entrepreneurship education course in their first semester of the final year in the university. This assertion is corroborated by Oseni (2017) who has opined that entrepreneurship education is a positive intervention that will minimize the problem of youth unemployment and improve the socio-economy of the society. This finding can be attributed to the fact that the goal of the introduction of entrepreneurship education in the university in Nigeria is being achieved. Therefore, this has highlighted the critical role of the university in preparing human resource that can drive innovation and improve the individuals' and national economic growth. Bosma, Content, Sanders, and Stam (2018) opined that the critical role of the university is to help learners acquire skills and apply these skills to a real-life situation, which is a link to economic growth.

The finding has shown that government support is a positive determinant of entrepreneurship intention among the population. The finding shows that only 11.8% of the total variance of entrepreneurship intention is accounted for by perceived government support. This result concurs with Denanyoh et al. (2015) who found that government and non-governmental support predicts entrepreneurship intention among university students. On the contrary, in Malaysia, it was found that there was no significant influence of structural supports on entrepreneurship intention (Ambad & Damita, 2016). This finding could be attributed to the perception of the respondents on government support, this implies that the greater the support from the government, non-governmental organization and family members the more STEM undergraduates' intention will increase. This support of this, Ambad et al., (2016) and Altiney, et al (2012) opined that support from friends and others positively impact an individuals' intention to become an entrepreneur. Given the preceding, Government and educational stakeholders should seek to establish in the educational system at all levels an entrepreneurship-focused policy that could enhance the intention to start a business among learners.

Although gender has a weak positive relationship with respondents' entrepreneurship intention, however, there was no significant relationship between gender and respondents' entrepreneurship intention. This result concurs with Onyeukwu and Padmavathi (2019) who observed that gender has a positive impact on entrepreneurship intention. The males have a slightly higher entrepreneurship intention than the females. This finding concurs with (Babikova & Bucek, 2019; Çera et al., 2018) who opined that males display higher intent towards entrepreneurship than females. This finding could be attributed to the fact that females especially Nigerian women are less self-confident and risk antagonistic or averse to start a business. This finding could be attributed to the fact that in this population business is culturally seen as a man's dominated business. The finding could also be attributed to the fact that males and females are influenced by different factors to engage in entrepreneurship.

## CONCLUSION

The study has revealed the significance of entrepreneurship education towards enhancing entrepreneurship intention and the creation of job prospects cannot be undermined. Given the findings, it will be logical to conclude that entrepreneurship education and government support are predictors of entrepreneurship intention among STEM university undergraduates' students. Gender does not significantly impact the entrepreneurship intention of the respondents in this population. Given the conclusion, it is recommended that The Nigerian government should impose the compulsory teaching and learning of entrepreneurship in all higher institutions. The government should improve the quality of entrepreneurship education by making the course practically oriented. Adequate government support should be provided for young graduates to engage in entrepreneurship. Finally, gender discrimination should be discouraged in any field and women should be encouraged to engage in entrepreneurship. The findings have highlighted the need to help the unemployed and prospective employees acquire competencies and skills to enable them to engage in entrepreneurship and to generate employment opportunities. Consequently, with the growing unemployment globally and especially in Nigeria, entrepreneurship education and government support, among others are critical factors to consider in the quest for entrepreneurship.

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