IMPACT OF ENTREPRENEURSHIP EDUCATION ON INNOVATION AMONG OFFICE TECHNOLOGY AND MANAGEMENT GRADUATES OF POLYTECHNICS IN KATSINA STATE, NIGERIA

Muhammad Sagir Abubakar
mbmodibbo@mau.edu.ng
Vocational Education Department
Modibbo Adama University, Yola
Adamawa state, Nigeria
&
Modibbo Buba Muhammed
ismee4mee@gmail.com
Vocational Education Department
Modibbo Adama University, Yola
Adamawa state, Nigeria

Abstract
This study examined the impact of entrepreneurship education on innovation among Office Technology and Management (OTM) graduates of Hassan Usman Katsina Polytechnic, Katsina state Nigeria. Two research questions and two hypotheses guided the study. A survey design was adopted with a population of 147 OTM graduates from 2020/2021 to 2022/2023 sessions. Census sampling was used to maintain the population of the research. Data was collected using a 19-item questionnaire, "Impact of Entrepreneurship Education on Promoting Innovation (IEEPI)," validated by three experts from Abubakar Tafawa Balewa University, Bauchi. A pilot test with 10 OTM graduates from Kano State Polytechnic yielded a Cronbach alpha of 0.85. The researcher and one trained assistant administered the questionnaire. Findings showed no statistically significant impact on social innovation [$F(1, 132) = 0.245$, $p = .621 > 0.05$, $R^2 = .002$, $B = .033$, $t = 0.494$]. However, entrepreneurship education significantly impacted marketing innovation [$F(1, 132) = 17.928$, $p = .000 < 0.05$, $R^2 = .120$, $B = .375$, $t = 4.234$]. The study concluded that entrepreneurship education significantly promotes marketing innovation among OTM graduates, while the relationship between entrepreneurship education and social innovation remains inconclusive. It recommended integrating experiential projects, real-world marketing challenges, industry collaborations, and community partnerships into the curriculum to bridge perception gaps and enhance graduates' innovative marketing strategies.

Keywords: **Entrepreneurship Education, Social Innovation, Marketing Innovation, OTM Graduates**

Introduction

Entrepreneurship education has become a vital component of modern education, aiming to equip students with the necessary skills, knowledge, and mindset to innovate and create sustainable businesses. In Nigeria, particularly in Katsina state, the need for entrepreneurship education is heightened due to the country's economic challenges, high unemployment rates, and the quest for sustainable development. Graduate unemployment in Nigeria, occasioned by growing economic downturn demands that all panaceas be identified and re enforced in the interest of National Development. The Federal Government in the realization that paid employment cannot be provided for all graduates introduced entrepreneurship education for undergraduates of all programs in tertiary institutions with the belief that this will reduce unemployment, enhance self-reliance, and accelerate national development, (Ezeonwurie, 2017). Entrepreneurship education involves teaching and learning of the needed skills and knowledge that equip one to become self-reliant through being an effective and successful initiator, manager, innovator and risk-bearer of business undertakings (Nwabufo and Mamman, 2015). Igbo (2009, as cited in Nwabufo and Mamman, 2015) supports the above meaning of entrepreneurship education when she says that such education should produce self-reliance, job creators and not job seekers, besides, it equips the individual for creative problem solving and innovation.

Innovation serves as an important driver for economic growth and development in various facets of the economy, such as education, commerce, transportation, and telecommunication (Oluwatobi et al., 2015). Entrepreneurship and innovation have progressively become popular in the world of academia, with polytechnics being seen as key players in driving economic growth through the creation of new businesses and the development of innovative technologies through different vocational courses.

Office Technology and Management is a structured programme of study in higher institutions of learning in Nigeria domiciled in the Department of Business Education and Vocational Education, usually at Faculties of Education or Colleges of Education and Polytechnics (Wiki, 2021). The programme must be accredited for studies by the National Board for Technical Education (NBTE), National University Commission (NUC), and National Commission for Colleges of Education (NCCE), for Polytechnics, Universities, and Colleges of Education, respectively.

Entrepreneurship education plays a crucial role in fostering social innovation by equipping individuals with the necessary skills, knowledge, and mindset to address societal challenges creatively and sustainably (Peter et al. 2019). Entrepreneurship education catalyzes social innovation by empowering OTM graduates to leverage their creativity, skills, and resources to address pressing societal needs and create sustainable solutions (Van der Have & Rubalcaba, 2016). Mentorship and networking have been identified as pivotal components in connecting students with seasoned entrepreneurs and industry professionals, and this exposes them to marketing innovation.

Marketing innovation, as a crucial aspect of business success, involves implementing new or improved marketing strategies to enhance organizational performance (Adedeji and Mohammad, 2018). Previous studies on marketing innovation have shown that entrepreneurship is a common denominator for this type of innovation, which ultimately leads to the creation and strengthening of competitive advantages. Alves (2016 as cited Sonia et al.,

2017) analyzed how entrepreneurial intensity and marketing capabilities affect organizational innovation and thus the competitive advantages of innovative organizations. Marketing innovation is defined as the implementation of a new marketing method entailing significant changes in product design or packaging, placement, promotion, or pricing (OECD, 2005 as cited in D'Attoma, 2020).

Many OTM graduates lack or fail to utilize entrepreneurial skills and innovation required to start and manage successful businesses, as Shuaibu et al. (2016) state that it is evident that many graduates of Office Technology and Management still roam the streets in search of non-existent white-collar jobs. This situation raises a question about the effectiveness of the entrepreneurship education program to which these graduates were exposed.

Statement of the Problem

Entrepreneurship education is a vital catalyst for promoting innovation and driving economic growth. However, within the context of Office Technology and Management graduates of Polytechnics in Katsina state, Nigeria, all efforts are being made to enhance them to become innovative in different entrepreneurial skills, but it is a known fact that after their graduation, these students still roam the street seeking take off employment and this shows that possible gaps exist within the entrepreneurship education given to them and need to be addressed. Efforts to identify and establish a fact about the issues responsible for unemployment among OTM graduates of Hassan Usman Katsina Polytechnic, Katsina, Katsina state, Nigeria, despite the entrepreneurship education they received, will depend on the results of this research. This problem prompted the researcher to carry out the study with the aim of identifying possible solutions, using empirical evidence.

Purpose of the Study

The main purpose of this study was to determine the impact of entrepreneurship education on innovation among Office Technology and Management graduates of Hassan Usman Katsina Polytechnic, Katsina.

Research Questions

This study was guided by the following research questions.

1. What is the impact of entrepreneurship education on social innovation among Office Technology and Management graduates of Hassan Usman Katsina Polytechnic, Katsina?
2. What is the impact of entrepreneurship education on marketing innovation among Office Technology and Management graduates of Hassan Usman Katsina Polytechnic, Katsina?

Research Hypotheses

The following null hypotheses were raised and tested at 0.05 level of significance.

$\mathbf{H0_1}$: Entrepreneurship education has no significant impact on social innovation among Office Technology and Management graduates of Hassan Usman Katsina Polytechnic, Katsina.

$\mathbf{H0_2}$: Entrepreneurship education has no significant impact on marketing innovation among Office Technology and Management graduates of Hassan Usman Katsina Polytechnic, Katsina.

Methods

A survey research design was employed for the study. This design involves the structured collection of data using a questionnaire from a sizeable population. The population for this study comprised 147 OTM graduates from Hassan Usman Katsina Polytechnic, Katsina, from the 2020/2021, 2021/2022, and 2022/2023 academic sessions. A census sampling technique was employed to maintain the population size for the research. The data collection instrument was a 19-item structured questionnaire titled "Impact of Entrepreneurship Education on Innovation. (IEEI)," developed by the researchers. It was validated by three experts from the Department of Vocational Education, Faculty of Education, Abubakar Tafawa Balewa University, Bauchi. To determine the reliability, the instrument was administered to 10 OTM graduates from Kano State Polytechnic, Kano, for the 2022/2023 session, which was not part of the main study. Their responses were analyzed using Cronbach alpha method, which yielded a coefficient alpha value of 0.85. The researchers, with the help of a trained research assistant, administered the instrument to respondents.

The complete questionnaires were retrieved immediately after administration. A total of 134 out of 147 graduates responded. The data collected were analyzed using mean and standard deviation statistics to answer the research questions, and simple linear regression was used to test the hypotheses. The questionnaire items were based on a four-point rating scale: Strongly Agree (SA) 4 points, Agree (A) 3 points, Disagree (D) 2 points, and Strongly Disagree (SD) 1 point. The cut-off mean point was 2.50; a mean of 2.50 and above was considered "Agree," while a mean below 2.49 was regarded as "Disagree." For the hypothesis tests, a p-value less than or equal to 0.05 ($p \leq 0.05$) led to the rejection of the null hypothesis, while a p-value greater than 0.05 ($p > 0.05$) resulted in its retention. All hypotheses were tested at a 0.05 significance level.

Research Question 1: What is the impact of entrepreneurship education on social innovation among office technology and management graduates of Hassan Usman Katsina Polytechnic, Katsina?

Table 1: Mean and Standard Deviation of Impact of Entrepreneurship Education on Social Innovation among Office Technology and Management Graduates of Hassan Usman Katsina Polytechnic, Katsina

S/N	Item (n = 134)	Mean	S.D	Remark
1	I can identify social problems that require innovative solutions.	3.75	0.57	A
2	I have developed innovative solutions that create social value.	3.83	0.48	A
3	I understand the role of entrepreneurship in addressing social issues.	3.74	0.57	A
4	I collaborate with stakeholders to implement social innovation projects.	3.85	0.51	A
5	I consider ethical concerns when developing social innovations.	3.72	0.62	A
6	I balance financial sustainability with social impact in my innovation efforts.	3.59	0.80	A

7	I engage communities to understand their needs before designing social solutions.	3.70	0.68	A
8	I can effectively secure funding for social innovation projects.	3.69	0.63	A
9	My ability to measure and evaluate the impact of social innovations has improved.	3.81	0.45	A
	Grand Mean	**3.74**	**0.59**	**A**

Table 1 indicates a very strong impact on social innovation. Means range from 3.69 to 3.85, with SDs from 0.48 to 0.80. Respondents affirmed capabilities in problem identification, community engagement, and creating social values. The grand mean of 3.74 and SD of 0.59 show a high and consistent positive effect.

Research Question 2: What is the impact of entrepreneurship education on marketing innovation among office technology and management graduates of Hassan Usman Katsina Polytechnic, Katsina?

Table 2: Mean and Standard Deviation of Impact of Entrepreneurship Education on Marketing Innovation among Office Technology and Management Graduates of Hassan Usman Katsina Polytechnic, Katsina

S/N	Item (n = 134)	Mean	S.D	Remark
10	I have developed innovative marketing strategies based on my entrepreneurship training.	3.77	0.62	A
11	I use data analytics to make informed marketing decisions.	3.69	0.65	A
12	I effectively use digital marketing tools (e.g., social media, SEO).	3.81	0.45	A
13	I understand branding and positioning strategies for innovative products.	3.66	0.56	A
14	I create engaging content tailored for different digital marketing channels.	3.61	0.62	A
15	I develop customer-centric marketing strategies that increase retention.	3.69	0.51	A
16	I regularly adapt my marketing strategies to changing consumer trends.	3.75	0.44	A
17	I use customer feedback to continuously improve marketing efforts.	3.31	0.76	A
18	I understand how to optimize marketing budgets for better efficiency.	3.48	0.57	A
19	I build strong business networks and partnerships to enhance marketing efforts.	3.14	0.89	A
	Grand Mean	3.59	0.61	**A**

Table 2 presents a strong but slightly varied impact on marketing innovation, with mean scores from 3.14 to 3.81 and SDs between 0.44 and 0.89. Respondents reported strong skills in digital marketing and customer focus, while partnership-building and budget optimization were weaker. The grand mean of 3.59 and SD of 0.61 suggest a generally high but slightly varied impact.

Test of Research Hypotheses

$H0_1$: Entrepreneurship education has no significant impact on social innovation among Office Technology and Management graduates of Hassan Usman Katsina Polytechnic, Katsina.

Table 3a: ANOVA Results of Impact of Entrepreneurship Education on Social Innovation among Office Technology and Management Graduates of Hassan Usman Katsina Polytechnic, Katsina

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.052	1	.052	.245	.621[b]
	Residual	28.051	132	.213		
	Total	28.103	133			

a. Dependent Variable: Social Innovation

b. Predictors: (Constant), Entrepreneurship Education

Table 3a presents the ANOVA results for the impact of social innovation on entrepreneurship education among Office Technology and Management graduates of Hassan Usman Katsina Polytechnic, Katsina. The analysis shows that the model is not statistically significant, with $F(1, 132) = 0.245$, $p > 0.05$. The p-value of 0.621 is well above the 0.05 threshold, suggesting that social innovation does not significantly predict variations in entrepreneurship education. Therefore, the null hypothesis ($H0_1$) stating that entrepreneurship education has no significant impact on social innovation cannot be rejected.

Table 3b: Model Summary

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate
1	.043[a]	.002	-.006	.46099

a. Predictors: (Constant), Social Innovation

As shown in Table 3b, the R value of .043 indicates a very weak positive correlation between social innovation and entrepreneurship education. The R Square value of .002 reveals that only 0.2% of the variation in entrepreneurship education is explained by social innovation. The Adjusted R Square of -0.006 suggests that the model performs worse than a simple mean-based prediction. The standard error of the estimate (.46099) further confirms the lack of predictive accuracy in this model.

Table 3c: Coefficients of Beta

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.478	.279		12.473	.000
	Social Innovation	.033	.067	.043	.495	.621

a. Dependent Variable: Entrepreneurship Education

The regression coefficients in Table 3c show that the unstandardized coefficient (B) for social innovation is .033, indicating a negligible increase in entrepreneurship education for each unit increase in social innovation. The standardized beta coefficient (.043) also reflects a weak and insignificant effect. The t-value of 0.495 and the corresponding p-value of 0.621 ($p > 0.05$) indicate that the relationship is not statistically significant. This supports the earlier conclusion that social innovation has no meaningful impact on entrepreneurship education in this context.

$H0_2$: Entrepreneurship education has no significant impact on marketing innovation among office technology and management graduates of Hassan Usman Katsina Polytechnic, Katsina.

Table 4a: ANOVA Results of Impact of Entrepreneurship Education on Marketing Innovation among Office Technology and Management Graduates of Hassan Usman Katsina Polytechnic, Katsina.

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3.361	1	3.361	17.928	.000[b]
	Residual	24.743	132	.187		
	Total	28.103	133			

a. Dependent Variable: Marketing Innovation

b. Predictors: (Constant), Entrepreneurship Education

Table 4a presents the ANOVA result regarding the impact of marketing innovation on entrepreneurship education. The model is statistically significant, with $F(1, 132) = 17.928$, $p < 0.05$. This indicates that marketing innovation is a significant predictor of entrepreneurship education among Office Technology and Management graduates. The very low p-value (0.000) confirms that the observed relationship is unlikely to have occurred by chance, thus warranting the rejection of the null hypothesis ($H0_2$).

Table 4b: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.346[a]	.120	.113	.43295

a. Predictors: (Constant), Entrepreneurship Education

The model summary in Table 4b shows an R value of .346, which indicates a moderate positive correlation between marketing innovation and entrepreneurship education. The R Square value of .120 reveals that 12% of the variance in entrepreneurship education is explained by marketing innovation. The Adjusted R Square of .113 suggests the model is fairly robust, while the standard error of the estimate (.43295) implies moderate predictive accuracy.

Table 4c: Coefficients of Beta

Model	Unstandardized Coefficients	Standardized Coefficients	T	Sig.

		B	Std. Error	Beta		
1	(Constant)	2.187	.339		6.453	.000
	Marketing Innovation	.375	.089	.346	4.234	.000

a. Dependent Variable: Entrepreneurship Education

According to Table 4c, the unstandardized coefficient (B) for marketing innovation is .375, implying that a unit increase in marketing innovation leads to an increase of 0.375 units in entrepreneurship education. The standardized beta coefficient of .346 indicates a moderate positive influence. The t-value of 4.234 and p-value of 0.000 ($p< 0.05$) show that this influence is statistically significant. Therefore, marketing innovation significantly contributes to entrepreneurship education among the graduates in question.

Discussion of the Findings

The study presents a strong perceived impact of entrepreneurship education on social innovation (mean = 3.74), it ultimately finds no statistically significant relationship between the two ($F (1,132) = 0.245$, $p = .621$, $R^2 = 0.002$). This suggests that, although respondents may value the role of entrepreneurship education in promoting social change or community-focused initiatives, empirical evidence from this context does not support a direct or reliable influence. This divergence is noteworthy when compared to broader findings in the literature. For instance, Gamede and Uleanya (2019) advocate for the alignment of TVET education with industry and societal needs, linking entrepreneurial initiatives to economic and social growth. However, closer examination of other empirical studies, such as those by Egbeyemi et al. (2023) and Rasaki et al. (2015), reveals that the principal focus tends to be on reducing poverty and fostering economic self-reliance, rather than explicitly targeting social innovation outcomes. Thus, the present finding suggests a nuanced understanding: while entrepreneurship education is widely lauded for its economic benefits, its direct impact on fostering social innovation as distinct from economic or process innovation is less clear and potentially context dependent. Rather than disputing previous empirical work, the current result reveals a gap pointing to the need for more targeted curricular elements or external support if social innovation outcomes are to be realized through entrepreneurship education.

Finally, the study demonstrates a statistically significant and generally high impact of entrepreneurship education on marketing innovation (mean = 3.57, $F (1,132) = 17.928$, $p< 0.05$, $R^2 = 0.120$), suggesting that such education equips graduates with the ability to develop creative marketing strategies and implement innovative promotion techniques. This finding is strongly supported by Madugu et al. (2023), Aigbepue and Akenbor (2022), and Tono (2023), who collectively argue that entrepreneurship education is instrumental in developing the practical and strategic skills necessary for successful marketing innovation.

Conclusion

This study establishes entrepreneurship education as a critical driver of innovative capacity in marketing domains among Office Technology and Management graduates of Hassan Usman Katsina Polytechnic, Katsina. Its integration into the polytechnic curriculum is indispensable for cultivating graduates equipped with the practical and creative skills necessary to excel in today's dynamic work environment. However, the relationship between

entrepreneurship education and social innovation remains inconclusive, indicating the need for targeted curricular enhancements or complementary interventions in this area. Overall, the strategic emphasis on entrepreneurship education is indispensable for advancing innovation and competitiveness among graduates, with particular attention required to fully leverage its influence on social innovation outcomes.

Recommendations

In line with the findings of the study, the following recommendations were made.

1. Program designers should introduce dedicated content and experiential projects that explicitly connect entrepreneurial skills with social problems, promoting social innovation through partnerships with local communities and organizations to bridge the observed gap between perception and statistically verified outcomes.
2. Entrepreneurship education should incorporate real-world marketing challenges, competitions, and collaborations with industry professionals to develop graduates' abilities to devise and implement innovative marketing strategies, thus strengthening their market-oriented competencies.

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