



ASSESSMENT OF THE ENTREPRENEURIAL SKILLS ACQUIRED BY UPPER BASIC SCIENCE STUDENTS IN APA LOCAL GOVERNMENT AREA OF BENUE STATE, NIGERIA

By

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Abstract

This study assessed the entrepreneurial skills acquired by Upper Basic Science students in Apa Local Government Area (LGA) of Benue State, Nigeria. Specifically, the study examined gender differences in entrepreneurial skills acquisition, evaluated the relevance of acquired skills to real-world business challenges, and identified areas requiring improvement. A descriptive survey research design was adopted, with a target population of 1,820 Upper Basic III students drawn from public and private secondary schools in Apa LGA. Using multi-stage sampling, a sample of 320 students was selected based on the Morgan and Morgan (1970) sample size determination table. Data were collected using a researcher-designed instrument titled the Entrepreneurial Skills Acquisition Questionnaire for Upper Basic Science Students (ESAQUBSS), which was validated by three experts and returned a reliability coefficient of 0.70 via the Cronbach's Alpha method. Data were analyzed using mean, standard deviation, and independent sample t-test at a 0.05 significance level. Findings revealed that students acquired entrepreneurial skills at a moderate level, with no statistically significant gender difference in acquisition ($t = 1.685, p = 0.093$). Students perceived their acquired skills as moderately relevant to real-world business demands (grand mean = 2.87), with stronger ratings for soft skills such as problem-solving and communication than for business-specific competencies. All identified areas required improvement, with practical training, laboratory equipment, and financial management training emerging as the most critical needs (grand mean = 3.09). The study recommended curriculum reforms, enhanced teacher training, and increased practical exposure to strengthen entrepreneurial skill development in Basic Science education.

Keywords: Entrepreneurial skills, Upper Basic Science, Skills acquisition, Science education, Entrepreneurship education.

Introduction

Education is widely recognized as a fundamental driver of individual and societal development, fostering cognitive, social, and emotional growth among learners (UNESCO, 2021). It serves as the bedrock for economic growth, technological advancement, and societal transformation, equipping individuals with the knowledge and competencies necessary for active participation in socio-economic activities (Okebukola, 2020). As societies evolve, the scope of

education continues to expand beyond traditional boundaries to meet the dynamic demands of the modern world.

In contemporary society, education is no longer limited to the acquisition of literacy and numeracy but now encompasses a broader scope that includes entrepreneurship education (Obi, 2019). Entrepreneurship education is essential for fostering creativity, innovation, and self-reliance among students, particularly in developing economies where youth unemployment remains a persistent challenge. The Nigerian educational system, structured into basic, secondary, and

tertiary levels, aims to provide students with functional knowledge that enhances their adaptability in an ever-changing world (FME, 2013).

Basic education plays a critical role in laying a strong foundation for lifelong learning and skill acquisition. The Universal Basic Education (UBE) program in Nigeria was introduced to ensure that all children acquire essential knowledge and competencies necessary for personal and national development (FME, 2019). Within this framework, science education plays a pivotal role in fostering critical thinking, problem-solving abilities, and innovative skills that prepare students for future economic participation.

Basic Science, as an integrated subject encompassing key concepts from physics, chemistry, and biology, offers students a holistic understanding of scientific principles (Eze, 2018). The Basic Science curriculum in Nigeria is designed to introduce learners to fundamental scientific concepts and processes, preparing them for more specialized studies at the senior secondary level (FME, 2013). It promotes scientific literacy, inquiry-based learning, and practical application of concepts, enabling students to develop skills essential for real-world problem-solving (Ogunleye, 2019; Jegede, 2016).

Given the increasing rate of unemployment in Nigeria, there has been a growing emphasis on entrepreneurial education as a means of equipping students with practical skills that enhance their employability and self-sufficiency (Olawale & Salami, 2020). Entrepreneurship, defined as the process of identifying opportunities and creating value through innovation (Schumpeter, 1934), plays a crucial role in economic development by fostering job creation, technological advancement, and wealth generation (Acs & Audretsch, 2018). Embedding entrepreneurial thinking within science education has therefore become an educational priority at the basic level.

Entrepreneurship education is increasingly being integrated into Basic Science curricula to equip students with the necessary skills for innovation and self-employment (Onyinyechi, 2020). Scientific inquiry and hands-on experimentation cultivate a mindset aligned with entrepreneurial thinking, including risk-taking, adaptability, and creative problem-solving (Eze & Okonkwo, 2021; Adamu & Yusuf, 2022). Entrepreneurial skills such as financial literacy, business management, and creativity have thus become critical components of science education, enabling students to translate scientific knowledge into practical and economic innovations (Eze, 2021).

Integrating entrepreneurial competencies into Basic Science education is therefore essential for preparing students to navigate the complexities of the modern workforce and become self-reliant contributors to national development (Obasi & Ojo, 2020; Adebisi, 2019). The need for a curriculum that effectively fosters these skills is paramount in ensuring that students not only excel academically but also develop the competencies required to thrive in the global economy (Adeyemo, 2018). Accordingly, this study seeks to evaluate the extent to which Basic Science education in Apa

Local Government Area of Benue State fosters entrepreneurial competencies among upper basic students.

Statement of the Problem

Entrepreneurial education has been recognized as a vital tool for promoting self-reliance, economic empowerment, and national development in Nigeria. The integration of entrepreneurial competencies into Basic Science, a core subject in the upper basic education curriculum, is intended to cultivate problem-solving abilities, creativity, and innovative thinking among learners (Adebayo & Ojo, 2020). However, growing concern exists regarding whether students at this level acquire entrepreneurial skills of sufficient quality to prepare them for real-world economic participation and self-employment (Ogunbiyi, 2023), suggesting a systemic misalignment between curriculum intentions and actual learning outcomes.

Despite policy efforts to embed entrepreneurship within science education, empirical evidence indicates that many Nigerian students complete the basic education cycle without the technical and innovative competencies required to initiate or sustain productive economic activities (Eze & Okon, 2021). A significant gap persists between instructional delivery and the practical demands of self-employment, raising fundamental questions about the adequacy of existing curricular frameworks and the pedagogical approaches employed in Basic Science classrooms (Adeyemo, 2021). Left unaddressed, this gap risks perpetuating youth unemployment and undermining national development objectives tied to science and technology education.

In Apa Local Government Area (LGA) of Benue State, little empirical attention has been directed toward entrepreneurial skill acquisition among upper basic science students. There is a critical need to evaluate the level of entrepreneurial competency within this population, identify barriers impeding skill development, and determine whether the current curriculum adequately responds to prevailing economic realities. Accordingly, this study seeks to assess the entrepreneurial skills acquired by upper basic science students in Apa LGA of Benue State, Nigeria, with a view to informing improvements in teaching strategies and curriculum design.

Purpose of the Study

The primary objective of this study was to assess the entrepreneurial skills acquired by Upper Basic Science students in Apa LGA of Benue State, Nigeria. Specifically, the study sought to:

1. compare the entrepreneurial skills acquisition of male and female students.
2. assess the relevance of acquired entrepreneurial skills to real-world business challenges.
3. identify areas of entrepreneurial skills that required improvement.

Research Questions

The following research questions guided the study:

1. What differences existed between male and female students in the acquisition of entrepreneurial skills?
2. How relevant were the entrepreneurial skills acquired by Upper Basic Science students to real-world business challenges?
3. What areas of entrepreneurial skills required improvement among Upper Basic Science students in Apa LGA?

Methodology

The study adopted a descriptive survey research design, which was considered appropriate as it allowed the researcher to gather information from a representative sample and describe the status of entrepreneurial skills acquisition among Upper Basic Science students without manipulating any variables. The study was conducted in Apa LGA of Benue State. The target population comprised all Upper Basic III (JSS 3) students in public and private secondary schools in the area. According to data from the 2025 Basic Education Certificate Examination (BECE), the total number of Upper Basic III students was 1,820. A sample of 320 students was selected using multi-stage sampling, based on the sample size determination table by Morgan and Morgan (1970). The main instrument for data collection was a researcher-designed questionnaire titled "Entrepreneurial Skills Acquisition Questionnaire for Upper Basic Science Students (ESAQUBSS)," which consisted of three sections: Section A

captured demographic information; Section B assessed entrepreneurial skills taught and acquired; and Section C measured factors influencing acquisition and the relevance of skills to real-life business challenges. Items were measured using a 4-point Likert scale ranging from Strongly Agree (4) to Strongly Disagree (1). The instrument was subjected to face and content validation by three experts in Science Education, Measurement and Evaluation, and Entrepreneurship Education respectively, whose feedback was used to revise the questionnaire prior to administration. Reliability was established through the Cronbach's Alpha method, using a pilot study of 20 Upper Basic Science students from a nearby LGA not included in the main study. A reliability coefficient of 0.70 was set as the acceptable threshold. Data collected were analyzed using descriptive and inferential statistics. Mean and standard deviation were used to address the research questions, while an independent sample t-test was used to examine gender differences in entrepreneurial skills acquisition. All analyses were conducted using the Statistical Package for the Social Sciences (SPSS), with the level of significance set at 0.05.

Results

Research Question 1: What differences existed between male and female students in the acquisition of entrepreneurial skills?

Hypothesis: There was no significant difference between male and female Upper Basic Science students in the acquisition of entrepreneurial skills ($\alpha = 0.05$).

Table 1: Independent Sample t-test of Gender Differences in Overall Skills Acquisition

Gender	N	Mean	SD	df	t-value	p-value	Decision
Male	156	2.63	0.52	2	1.685	0.093	Not Significant
Female	156	2.55	0.44				

Decision Rule: Reject H_0 if $p\text{-value} < 0.05$; Accept H_0 if $p\text{-value} \geq 0.05$

Table 1 showed that male students recorded a slightly higher mean score ($M=2.63$) compared to female students ($M=2.55$) in overall entrepreneurial skills acquisition. However, the independent sample t-test yielded $t(310)=1.685$, $p=0.093$, which was greater than the 0.05 significance level. The null hypothesis was therefore accepted, indicating that there was

no statistically significant difference between male and female students in entrepreneurial skills acquisition. Both genders acquired entrepreneurial skills at comparable levels.

Research Question 2: How relevant were the entrepreneurial skills acquired by Upper Basic Science students to real-world business challenges?

Table 2: Mean and Standard Deviation of Relevance of Acquired Skills to Real-World Business Challenges

S/N	Relevance Statement	Mean	SD	Remark
51	Problem-solving skills can help me handle business challenges	3.42	0.62	Highly Relevant
52	Teamwork skills are important for business partnerships	3.35	0.66	Highly Relevant
49	Communication skills are valuable for business interactions	3.28	0.69	Highly Relevant
57	The entrepreneurial skills can help me become self-employed	3.21	0.73	Highly Relevant
59	The entrepreneurial training prepares me for future opportunities	3.15	0.75	Highly Relevant

S/N	Relevance Statement	Mean	SD	Remark
56	Resource management skills can help me run an efficient business	3.08	0.78	Highly Relevant
46	The skills can help me start a small business	2.98	0.82	Relevant
60	The skills can help community economic development	2.89	0.85	Relevant
53	Innovation skills can help me create competitive products	2.76	0.91	Relevant
58	The skills learned are relevant to current market demands	2.68	0.94	Relevant
47	Product-making skills are applicable to real-world businesses	2.61	0.97	Relevant
54	Record-keeping skills are useful for managing business transactions	2.52	1.01	Relevant
48	Marketing skills taught are useful for selling products	2.45	1.05	Low Relevance
50	Financial management skills are practical for running a business	2.38	1.08	Low Relevance
55	Customer service skills are applicable to real business situations	2.24	1.12	Low Relevance
	Grand Mean	2.87	0.46	Relevant

Decision Rule: Mean ≥ 2.50 = Relevant; Mean < 2.50 = Not Adequately Relevant

Table 2 revealed a grand mean of 2.87, indicating that students perceived the entrepreneurial skills acquired as relevant to real-world business challenges. The most highly rated skills were problem-solving (M=3.42), teamwork (M=3.35), and communication (M=3.28), which students recognized as transferable to business contexts. Students also acknowledged that these skills could facilitate self-employment (M=3.21) and prepare them for future

opportunities (M=3.15). However, business-specific skills such as customer service (M=2.24), financial management (M=2.38), and marketing (M=2.45) were perceived as less relevant, possibly due to limited practical experience or insufficient understanding of their real-world application.

Research Question 3: What areas of entrepreneurial skills required improvement among Upper Basic Science students in Apa LGA?

Table 3: Mean and Standard Deviation of Areas Requiring Improvement among Upper Basic Science Students in Apa LGA

S/N	Area for Improvement	Mean	SD	Rank	Remark
61	More practical hands-on training in product development	3.48	0.59	1st	Great Need
64	Better science laboratory equipment and materials	3.42	0.63	2nd	Great Need
67	More exposure to real business environments through field trips	3.38	0.65	3rd	Great Need
65	More training on financial management and business planning	3.32	0.68	4th	Great Need
66	Additional marketing and sales skills training	3.28	0.71	5th	Great Need
73	More funding and resources for entrepreneurship activities	3.24	0.74	6th	Great Need
68	Teachers need more training in entrepreneurship education	3.18	0.76	7th	Great Need
71	More mentorship programs with successful entrepreneurs	3.12	0.79	8th	Great Need
70	Better integration of entrepreneurship into science curriculum	3.05	0.82	9th	Great Need
63	More time should be allocated for entrepreneurship lessons	2.98	0.85	10th	Need
74	Better linkage between classroom learning and real-world application	2.92	0.88	11th	Need
69	More emphasis on innovation and creativity	2.85	0.91	12th	Need
62	Improved teaching methods for entrepreneurial skills	2.76	0.94	13th	Need
72	Improved assessment methods for entrepreneurial skills	2.68	0.97	14th	Need

S/N	Area for Improvement	Mean	SD	Rank	Remark
75	More support from parents and the community	2.61	1.01	15th	Need
	Grand Mean	3.09	0.42		Great Need

Decision Rule: Mean ≥ 2.50 = Needs Improvement; Mean < 2.50 = Does Not Significantly Need Improvement

Table 3 revealed that all identified areas required improvement, with a high grand mean of 3.09. The most critical areas demanding urgent attention were practical hands-on training (M=3.48), better laboratory equipment (M=3.42), exposure to real business environments (M=3.38), financial management training (M=3.32), and marketing skills training (M=3.28). These findings were consistent with earlier results indicating that business-specific skills were inadequately taught and poorly acquired. Students also identified the need for increased funding (M=3.24), teacher training in entrepreneurship (M=3.18), and mentorship programs (M=3.12). The high mean scores across all items indicated widespread recognition among students that current entrepreneurial skills training in Upper Basic Science required substantial enhancement.

Discussion of Findings

The first finding revealed no statistically significant difference between male and female Upper Basic Science students in entrepreneurial skills acquisition ($t = 1.685$, $p = 0.093 > 0.05$), with both genders recording comparable mean scores (male: $M = 2.63$; female: $M = 2.55$). This finding contradicted Akinyemi and Olatunji (2020), who reported that male students typically outperformed female peers in entrepreneurial competencies. However, it aligned with Agommuoh and Nwewi (2017), Osuala (2009), and Amadi and Chuku (2021), all of whom found no significant gender disparity in entrepreneurship-related learning outcomes.

This observed gender parity could be attributed to several factors. Upper Basic Science students were still in early adolescence, a developmental stage at which gender-based socialization regarding entrepreneurship had not yet become strongly entrenched. Additionally, consistent curriculum delivery within science classrooms may have reduced opportunities for gendered instructional bias. The equal representation of male and female students in the sample (50% each) may also have contributed to the balanced outcome. The divergence from Akinyemi and Olatunji's (2020) findings likely reflected contextual differences, as their study examined broader educational settings while the present study focused specifically on science-based entrepreneurship within a single geographical area. Nonetheless, the parity observed was a promising indicator of educational equity, suggesting that when entrepreneurship education was systematically integrated into science instruction, both male and female learners benefited equally.

The second finding indicated that students perceived the entrepreneurial skills they acquired as relevant to real-world business challenges, as reflected by a grand mean of 2.87. Skills rated most highly included problem-solving ($M = 3.42$), teamwork ($M = 3.35$), and communication ($M = 3.28$), which

students recognized as transferable to business contexts. Students also acknowledged that their acquired skills could support self-employment ($M = 3.21$) and prepare them for future economic opportunities ($M = 3.15$). These perceptions demonstrated a degree of metacognitive awareness and suggested that students were able to conceptualize how their learning could support future entrepreneurial activities.

However, business-specific skills such as customer service ($M = 2.24$), financial management ($M = 2.38$), and marketing ($M = 2.45$) were rated below the benchmark, indicating low perceived relevance in these areas. This pattern was consistent with Okezie et al. (2013), who argued that limited practical exposure prevented students from fully appreciating the real-world applicability of entrepreneurial concepts. While students expressed optimism regarding self-employment and future business opportunities, this optimism appeared to be inadequately grounded due to weak acquisition of essential business management skills. This finding partly contrasted with Umeh and Eze (2018), who reported broader gaps between curriculum content and job-market needs, though the present study similarly confirmed that functional business competence among students remained limited despite their conceptual awareness of skill relevance.

The third finding revealed a strong student consensus that entrepreneurship education required improvement across all assessed dimensions, as indicated by a grand mean of 3.09. The most urgently identified needs were practical hands-on training in product development ($M = 3.48$), better laboratory equipment and materials ($M = 3.42$), and greater exposure to real business environments through field trips ($M = 3.38$). These priorities directly aligned with the curriculum-related challenges documented by Mbanefo and Eboka (2021), confirming that students themselves were aware of existing instructional limitations within the current science education framework.

Students further emphasized the need for improved financial management training ($M = 3.32$) and marketing skills development ($M = 3.28$), concerns that corresponded with the skill gaps identified in the preceding findings and supported Umeh and Eze's (2018) argument that the existing curriculum did not adequately align with labour-market demands. The call for increased funding and resources ($M = 3.24$) and enhanced teacher training in entrepreneurship education ($M = 3.18$) reinforced challenges previously highlighted in related literature, strengthening the case for systemic reforms in instructional resources and teacher preparation. Students also expressed a strong need for mentorship opportunities with successful entrepreneurs ($M = 3.12$), supporting Agommuoh and Nwewi's (2017) recommendation that hands-on mentorship was a crucial strategy for developing entrepreneurial competence.

Furthermore, students identified the need for better curriculum integration of entrepreneurship into Basic Science ($M = 3.05$) and extended instructional time ($M = 2.98$), pointing to broader structural limitations in the organization of entrepreneurship education. Although teaching methods ($M = 2.76$) and assessment techniques ($M = 2.68$) received comparatively lower ratings, both remained above the 2.50 benchmark, indicating that students perceived the need for improvement across every assessed area. This comprehensive pattern suggested that current entrepreneurship education in Upper Basic Science provided foundational awareness but lacked the depth and practical orientation required for full competence development, consistent with Usman and Abubakar's (2020) emphasis on activity-based instructional methods as a framework for addressing these gaps.

Conclusion

The findings of this study demonstrated that Upper Basic Science students in Apa Local Government Area of Benue State acquired entrepreneurial skills at a moderate level, with no statistically significant difference observed between male and female students in their level of acquisition. This gender parity suggested that the current science curriculum delivered entrepreneurial content in a relatively equitable manner across both sexes. However, the moderate acquisition levels recorded by both genders indicated that the overall depth of entrepreneurial skill development within the existing instructional framework remained insufficient for preparing students adequately for real-world economic participation.

With respect to the relevance of acquired skills, students generally perceived their entrepreneurial competencies as relevant to real-world business challenges, particularly in the areas of problem-solving, teamwork, and communication. Nevertheless, critical business-specific skills such as financial management, marketing, and customer service were rated below the relevance benchmark, revealing a significant gap between the soft skills emphasized in classroom instruction and the practical business competencies required for self-employment and entrepreneurial ventures. This gap underscored the limitations of the current Basic Science curriculum in addressing the full spectrum of entrepreneurial demands faced by young learners in contemporary society.

Overall, students expressed a strong consensus that entrepreneurship education in Upper Basic Science required substantial improvement across multiple dimensions, including practical training, laboratory resources, teacher capacity, curriculum integration, and exposure to real business environments. These findings collectively indicated that while Basic Science education in Apa LGA laid a foundational awareness of entrepreneurial concepts, it fell short of equipping students with the functional competencies necessary for sustainable self-employment and economic productivity. There was therefore an urgent need for coordinated efforts by curriculum developers, policymakers, and school administrators to strengthen the entrepreneurial content and pedagogical approaches embedded within the Basic Science curriculum.

Recommendations

Based on the findings and conclusions of this study, the following recommendations were made:

1. The Basic Science curriculum at the upper basic level should be reviewed to incorporate more practical entrepreneurial content, particularly in financial management, marketing, and customer service. Curriculum developers and the Nigerian Educational Research and Development Council (NERDC) should ensure that entrepreneurial skill components are explicitly integrated and assessable within the Basic Science syllabus, exposing students to the full range of competencies required for real-world business engagement and self-employment.
2. Science teachers at the upper basic level should be provided with regular professional development training in entrepreneurship education. State and local government education authorities should collaborate with higher institutions and entrepreneurship development agencies to organize workshops and capacity-building programs that equip teachers with the necessary pedagogical skills and content knowledge for effective entrepreneurial instruction, thereby bridging the gap between curriculum intentions and classroom delivery.
3. School administrators and government agencies should prioritize the provision of adequate laboratory equipment, instructional materials, and funding for entrepreneurship-related activities. Practical hands-on training should be institutionalized through product development sessions, business simulation exercises, and field trips to real business environments. Such experiential learning opportunities would expose students to authentic entrepreneurial contexts and significantly enhance the depth and quality of skill acquisition beyond conventional classroom instruction.

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