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ENTREPRENEURIAL ASPIRATIONS AS PREDICTORS OF SENIOR SECONDARY SCHOOL STUDENTS' MATHEMATICS INTEREST IN ANAMBRA STATE, NIGERIA

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ABSTRACT

The biting hardship in Nigeria, occasioned by graduate unemployment has been a source of concern to all. Mathematics teaching and learning can be a solution to the menace. This study therefore determined the relationship between entrepreneurial aspirations and mathematics interest of senior secondary school students in Anambra state. The study adopted a correlation research design. Three research questions and three hypotheses were used for the study. Multi stage sampling procedure was used to draw 2000 SS3 students from the state. Entrepreneurial Aspiration Scale (EAS) and Mathematics Interest Scale (MIS) were used as instruments for data collection. The EAS and MAT were validated by three experts. The reliability of the instruments were established using Cronbach Alpha which yielded coefficient values of 0.68 and 0.70 respectively. The instruments were administered to the students through the help of research assistants, who scored the instruments and collated the data for analysis. The data obtained from the study were analyzed using Mean, Standard deviation, simple and multiple linear regressions. Findings of the study revealed among others that students who have entrepreneurial aspiration for entertainment industry had significantly higher interest in mathematics than those having other entrepreneurial aspirations. There exists a statistically non-significant positive relationship between senior secondary school students' entrepreneurial aspirations and their interest in mathematics. The study recommended among others that mathematics teachers should teach the subject with fun in order to arouse the interest of the students. Again, effort should be made by the government to ensure proper remuneration of mathematics teacher in the state.

Keywords: Entrepreneurial aspirations, Mathematics interest, senior secondary school students

Introduction

Education is seen as the chief agent for training the young for competent adult role achievement and socialization. Any nation in the 21st century that aspires to prosper must have means of imparting technological and occupational skills in her citizens. On this basis, science, technology and mathematics education become a necessity to be pursued. Science, Technology, Engineering and Mathematics (STEM) are powerful tools for social, economic and political development of any nation. Thus, many countries of the world have continued to invest enormous resources in STEM education. It is important to make

clear the various levels of occupation in science and technology for which requisite human-power must be produced by the education system (Olamide & Olawaiye, 2019). This is because our current education programme is lacking in some of the major ingredients that are necessary for adequate self-reliance of the recipients (Chiakwelu & Okigbo, 2021).

Mathematics as a human activity is very relevant to everyday activities of man and manifests in all cultures of the world over. This is as it provides a powerful, concise, and unambiguous means of communication among people of either the same culture or different cultures. This is the reason Matt (2016) indicated that every society no matter the level of its development develop some type of mathematics that help its people to tackle their societal problem. That is, we find in every culture a way of counting, subtracting, and performing logical deductive reasoning that could be considered unique to that culture (Mgban and Julie, 2019). This is why we find adults and even school age children without formal education exhibiting some basic mathematical competencies in their day to day activities (Ezeanyi, 2021). These skills are necessary for their entrepreneurial adventures.

Entrepreneurship can be seen as the act of identifying, initiating, organizing, and bringing an idea to life. It is the process of using private initiatives to transform a business concept into a new venture or to grow and diversify an existing venture or enterprise with high growth potential (Uzoka, 2015; Nnamani, 2018). It is all about self-empowerment, which is very important for refining an individual's quality of life and national development (Jimngang, 2018). Entrepreneurship education leads to the acquisition of entrepreneurial skill for efficient and effective living. It gives the youths more opportunities to use creative freedom, acquire higher self-esteem, and gain a greater sense of control over their own lives.

An entrepreneur is one who accepts the risk of organising and managing a business. The entrepreneur looks inward into his/her environment to identify problems confronting people (or business opportunities) and introduces new products and services for the purpose of making profit (Nauta, Epperson and Kahn, 2013). Olibie and Obidike (2018) stated that an entrepreneur is not only an innovator but also a lifelong learner, a creative person, an initiator, and a potential industrialist.

Entrepreneurial skills are abilities possessed by a person that makes one to become self-reliant. According to Nwekeaku (2013), entrepreneurial skills and knowledge can play an important role among young people to achieve a bright professional perspective. Nicole (2021) defined entrepreneurial skills as the ability of an individual to exploit an idea and create an enterprise (small or big), not only for personal gain but also for social and developmental gain. Some of these entrepreneurial skills includes: creative thinking, planning of research, decision making, organizing, communicating and team building, marketing, and managing. According to Ayatse (2013), entrepreneurial skills are forces towards wealth creation and innovation. Improving on entrepreneurial

skills in mathematics requires that the teacher has to relate theoretical content to real business challenges, teach specific contents with caution on areas that will develop the student business initiative, involve professionals in areas needed, encourage field trips to small medium enterprise (SMES), motivate students' business ideas, and stress the importance of mathematics to learner.

Literature is not replete with information as to whether entrepreneurial aspirations affect students' interest in mathematics. Interest is described as being engaged, engrossed, or entirely taken up with an activity, object, or topic (Desy, Peterson & Brockman, 2011). Interest is interpreted as a relatively stable tendency to occupy oneself with an object of interest. On a second level, interest refers to current engagements. Interest in mathematics can be influenced through assessment for learning strategy, this helps in making understanding and knowledge more visible. It also helps learners know the meaning of excellence and how they can develop their own work to reach that level (Akinoso & Ogunleye, 2016). The interest to learn mathematics as established hitherto, could be influenced by entrepreneurial aspirations. It is logical to think that such students who aspire to be entrepreneurs in different fields of life may have varied need and desire to learn or continue learning mathematics. Such desire therefore influences their achievement in mathematics.

For instance, a student whose entrepreneurial aspiration cuts into the creation of mobile bank saving deposits with a view of making profit by the end of the month may desire mathematics knowledge in statistics and arithmetic more than a students who wants to go into horticulture business as entrepreneur which may require frequency counts and percentages. The entrepreneurial aspiration for planting, growing and nurturing flowers for sales and profit may require less mathematics imputes compared to someone dealing directly with numbers and its application and like the mobile bank savings deposit operator. It becomes pertinent that a study be conducted to empirically establish whether entrepreneurial aspirations correlate mathematics interest of students and how these aspirations vary with their interest in different aspects of mathematics. Such a study as this, ascertained if students with entrepreneurial aspirations in barbing, fashion design, automobile repairs, painting, information technology, social media influencing and software development have the same or different mathematics interest. The necessity of this study also arose from the fact that mathematics can enable the students acquire and develop requisite entrepreneurial skills such as computation of numbers, probability and use of algebraic fractions and statistics to develop business models and predict business outcomes as entrepreneurs.

Statement of the Problem

With unemployment rate increasing on a daily basis, secondary school leavers now aspire to venture into different areas of entrepreneurship. But they cannot be successful in any area of entrepreneurial endeavour without requisite skills and

knowledge. Mathematics education is expected to equip students with relevant skills that will enable them to be self-employable and self-reliant on leaving school, especially helping them in the development of entrepreneurial aspirations for different fields of life. However, students' interest in mathematics has dwindled over the years as can be seen in performances of students, both at internal and external examinations. Interest in mathematics is sometimes driven by entrepreneurial aspirations because students' aspirations may require different levels and different aspects of mathematical knowledge and skills. For instance, students who aspire to be builders may perform better in certain aspects of mathematics than those who aspire to be hair dressers. Also, one can expect that areas of entrepreneurship which require higher mathematical thinking to have their aspirants with higher interest in mathematics than those going for lower mathematical thinking entrepreneurship. This in itself may suggest that aspiration into different entrepreneurship areas will have differing mathematics interest. The need arose therefore, to empirically establish whether students' interests in mathematics differ according to their entrepreneurial aspirations and if entrepreneurial aspirations have any relationship with interest in mathematics.

Purpose of the Study

The purpose of this study is to determine the relationship between entrepreneurial aspirations and senior secondary school students' interest in mathematics in Anambra State. The specific objectives are as follows:

1. Determine the difference in students' interest scores in mathematics based on their entrepreneurial aspirations.
2. Examine the relationship between entrepreneurial aspirations and students' interest in mathematics.
3. Determine the relationship between the different dimensions of entrepreneurial aspirations (food services, automobile services, electrical/electronic services, building technology, entertainment industry, fashion/beauty services) and students' interest in mathematics.

Research Questions

The study was guided by the following research questions:

1. What is the difference in students' interest scores in mathematics based on their entrepreneurial aspirations?
2. What is the relationship between entrepreneurial aspirations and students' interest in mathematics?
3. What is the relationship between the different dimensions of entrepreneurial aspiration (food services, automobile services, electrical/electronic services, building technology, entertainment industry, fashion/beauty services) and students' interest in mathematics?

Hypotheses

The following null hypotheses were tested at 0.05 alpha levels.

1. There is no significant difference between students' interest scores in

mathematics based on their entrepreneurial aspirations.
2. There is no significant relationship between entrepreneurial aspirations and students' interest scores in mathematics.
3. There is no significant relationship between the different entrepreneurial aspirations (food services, automobile services, electrical/electronic services, building technology, entertainment industry, fashion/beauty services) and students' interest scores in mathematics.

Research Method

This study adopted the correlation research design. Such a design is useful for the study of causes where experimental assignment or manipulation is infeasible and unethical. It indicates how one variable impacts on another as well as the direction and magnitude of the relationship between the variables. The study was carried out in Anambra State. The sample size used for the study was 2000 SS3 students from the state, which were obtained using multi-stage sampling procedure.

Two instruments were used for gathering data for the study. They are Entrepreneurial Aspirations Scale (EAS) and Mathematics Interest Scale (MIS). Entrepreneurial Aspirations Scale (EAS) is a scale developed by the researcher to determine the students' entrepreneurial aspirations. Thirty different entrepreneurial aspirations were identified by the researcher and clustered into six (6) major groups. The clusters are to make for easy discussions on their relationship with mathematics interest. Mathematics Interest Scale (MIS) is a scale adapted from Chiakwelu & Okigbo (2021) and modified to suit the present study. The items focused mainly on students' interest in general mathematics contents. In the present study, the MIS was designed to measure the students' interest in those mathematics concepts that has applications in various entrepreneurship areas.

The instruments were validated by three experts**.** The reliability of EAS and MIS were established using Cronbach's Alpha. The EAS and MIS yielded reliability coefficients of 0.68 and 0.70 respectively. These were considered high enough to be used for this study.

The instruments were administered to the students through the help of research assistants. When administering the instruments, students were assigned serial numbers which were written on their copy of instrument, this was to ensure that the scores of EAS and MIS are matched for each student.

Data generated from this study were analysed using descriptive statistics (Mean, Standard Deviation), simple linear and multiple regressions.

Presentation of Results

Research question one: What is the difference in students' interest scores in Mathematics based on their entrepreneurial aspirations?

Table 1: Difference in students' interest scores in mathematics based on their entrepreneurial aspirations

Entrepreneurial aspiration	N	Mathematics Interest	
		$\bar{x}$	SD
Food Services	224	65.96	10.32
Automobile Services	300	65.30	10.83
Electrical/Electronic	333	63.43	11.40
Building Technology	341	64.72	11.56
Entertainment Industry	472	69.13	11.61
Fashion/Beauty Services	330	63.32	11.91

Table 1 showed that students aspiring to go into entertainment industry had interest score of 69.13, those aspiring for food services had interest score of 65.96, those aspiring for automobile services had interest score of 65.30. In addition, students aspiring for building technology had interest score of 64.72 while those aspiring for fashion/beauty services had interest score of 63.32. The table further showed that students aspiring to go into entertainment industry had the highest interest score of 69.13 in general Mathematics while those aspiring for fashion/beauty services had the least interest score of 63.32 in the subject.

Research question two: What is the relationship between entrepreneurial aspirations and students' interest scores in Mathematics?

Table 2: Relationship between entrepreneurial aspirations and students' interest scores in mathematics

Model	R	R^2	Adjusted R^2	Unstandardized coefficients (b)	Std. Error	Decision
Constant Entrepreneurial Aspiration	.021[a]	.002	.001	64.970 .152	11.556	Positive relationship

Predictors: (Constant), Entrepreneurial Aspiration

Table 2 shows that a positive relationship (R = 0.021) exists between students' entrepreneurial aspirations and their interest scores in Mathematics. The R-Square value of 0.002 indicates that 0.2% of the variance in interest in Mathematics is explained by students' entrepreneurial aspirations.

Research question three: What is the relationship between the different dimensions of entrepreneurial aspiration (food services, automobile services, electrical/electronic services, building technology, entertainment industry, fashion/beauty services) and students' interest scores in mathematics?

Table 3: Relative contributory relationship between different entrepreneurial aspirations of senior secondary school students to interest in mathematics

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	65.777	.427		154.101	.000
	Food Services	.560	1.016	.013	.552	.581
	Automobile Services	1.322	1.018	.031	1.298	.194
	Electrical/Electronic	1.427	.834	.042	1.712	.087
	Building Technology	.457	.804	.014	.568	.570
	Entertainment Industry	.995	.835	.029	1.192	.234
	Fashion/Beauty Services	.724	1.038	.016	.697	.486

a. Dependent Variable: mathematics interest

Table 3 shows the standardized beta coefficient which indicates correlation between variables. The unstandardized beta coefficient shows the predictive powers of each entrepreneurial aspiration which indicates their relative contribution to interest in mathematics. Table 3 shows that aspiration for food services has a positive relationship (R = 0.013) with students' interest in mathematics, automobile services has a negative relationship (R = 0.031) with interest in mathematics, while electrical/electronic has a positive relationship (R = 0.042) with interest, building technology has a positive relationship (R = 0.014) with interest while aspiration for entertainment services has a positive relationship (R = 0.029) and aspiration for fashion/beauty services has a positive relationship (R = 0.016). Table 3 also reveals that with a unit increase in the entrepreneurial aspiration for food services, interest in mathematics increases by 0.560; with a unit increase in the aspiration for fashion/beauty services, interest in Mathematics increases by 0.724; and with a unit increase in the aspiration for building technology and entertainment industry, interest in mathematics increases by 0.457 and 0.995 respectively. However, interest in mathematics increases by 1.322 whenever students' entrepreneurial aspiration for automobile services increases by 1 unit and by 1.427 when aspiration for electrical and electronic services increases by 1 unit. The order of relative contribution to increment in interest in mathematics from the highest to lowest by entrepreneurial aspiration is; electrical/electronic (1.427), followed by automobile services (1.322), entertainment industry (0.995), fashion/beauty service (0.725), food services (0.560) and building technology (0.457).

Hypotheses

H01: There is no significant difference between students' interest scores in Mathematics based on their entrepreneurial aspirations.

Table 4: Significance of difference between students' mean interest scores in mathematics based on their entrepreneurial aspirations

Source	SS	Df	Mean Square	F	Sig.
Corrected Model	9457.664[a]	5	1891.533	14.649	.000
Intercept	8132634.302	1	8132634.302	62981.777	.000
Entrepreneurial Aspiration	9457.664	5	1891.533	14.649	.000
Error	257478.808	1994	129.127		
Total	8858444.000	2000			
Corrected Total	266936.472	1999			

Table 4 shows that there is a significant difference between the mean interest scores of senior secondary school students with different entrepreneurial aspirations in favour of students aspiring for entertainment industry, F (5, 1994) = 14.640, P < 0.05. The null hypothesis was therefore rejected implying that there is significant difference between students' interest scores in Mathematics based on their entrepreneurial aspirations.

H02: There is no significant relationship between entrepreneurial aspiration and students' interest in Mathematics.

Table 5: Significance of relationship between students' entrepreneurial aspirations and interest in Mathematics

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	120.673	1	120.673	.904	.342[b]
	Residual	266815.799	1998	133.541		
	Total	266936.472	1999			

a. Dependent Variable: Interest
b. Predictors: (Constant), Entrepreneurial Aspiration

Table 5 shows that the relationship between entrepreneurial aspirations and interest in Mathematics is not significant F (1, 1998) = 0.904, P (0.342) > 0.05. The null hypothesis was therefore not rejected implying that there is no significant relationship between entrepreneurial aspirations and students' interest in mathematics.

H03: There is no significant relationship between the different entrepreneurial aspirations (food services, automobile

services, electrical/electronic services, building technology, entertainment industry, fashion/beauty services) and students' interest in Mathematics.

Table 6: ANOVA on significance of relationship between students' entrepreneurial aspirations and interest in Mathematics

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1135.185	6	189.198	1.419	.204[b]
	Residual	265801.287	1993	133.367		
	Total	266936.472	1999			

a. Dependent Variable: Interest
b. Predictors: (Constant), Fashion/Beauty Services, Food Services, Automobile Services, Building Technology, Electrical/Electronic

Table 6 shows that the relationship between entrepreneurial aspirations and interest in Mathematics is not significant F (6, 1993) = 1.419, P (0.204) > 0.05. The null hypothesis was therefore not rejected implying that there is no significant relationship between the different entrepreneurial aspirations (food services, automobile services, electrical/electronic services, building technology, entertainment industry, fashion/beauty services) and students' interest in Mathematics.

Discussion of Findings

The findings of the study showed that when students' aspiration for a particular entrepreneurship area increases by 1 unit, the likelihood is that those who aspire for electrical/electronic services will attain significantly higher interest in mathematics, followed by those aspiring for building technology. Thus, the stronger the students' aspiration is for electric/electronic services, the more their interest in mathematics. This is so because; they will desire to understand the subject better. At such time, their desire to attain higher achievement in mathematics will be fuelled by their intrinsic motivation.

The study also revealed that, although, there exists a non-significant positive relationship between senior secondary school students' entrepreneurial aspirations and their interest in mathematics, students who have entrepreneurial aspiration for entertainment industry have significantly higher interest in mathematics than those having other entrepreneurial aspirations. Given that mathematics is a necessary and important subject and may have been perceived as difficult by students opting to venture into entertainment industry, their interest may grow out of a desire to ensure that they pass the subject. Therefore, students who have aspirations for entertainment industry develop serious interest in mathematics more than students of other entrepreneurial aspirations.

Conclusion

It can be concluded from the findings of the study that a significant relationship exists between senior secondary school entrepreneurial aspirations and interest in

mathematics. Most importantly, an entrepreneurial aspiration for entertainment industry, more than any other aspiration bears the most significant boost in students' interest in mathematics. The general conclusion from the study therefore, is that aspiration for entertainment industry significantly enhances students' interest in mathematics than students nurturing other entrepreneurial aspirations.

Recommendations

The following recommendations are made based on the findings of the study.

1. Government should provide entertainment platforms and government sponsored entertainment school clubs to enable potential secondary school students develop their artistic skills while in school and make it easier to establish entertainment business ventures if their entrepreneurial aspirations cut across entertainment lines.
2. Government, through the ministry of education and post-primary school service commission should organise entrepreneurship orientation and education to acquaint students of different entrepreneurial aspirations the importance of mathematics in any venture even in everyday life.
3. Effort should be made by senior secondary school mathematics teachers to relate mathematics concepts and contents to their applications to everyday living and in the real world in order to enable students develop greater interest in the subject despite their varied intentions for any entrepreneurship undertaking.

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