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PROF. PATRICK C. IGBOJINWAEKWU

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EDITORIAL

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We are grateful to the contributors and hope that our readers will enjoy reading these contributions.

Prof. Patrick C. Igbojinwaekwu
Editor-in-Chief

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ACHIEVEMENT MOTIVATION AND SELF-CONCEPT AS CORRELATES OF INTEREST AND ACADEMIC ACHIEVEMENT IN MATHEMATICS AMONG SENIOR SECONDARY SCHOOL STUDENTS IN ANAMBRA STATE

[1]Prof Nonye Ngozi Achufusi, [2] Edochie Valentine Chikeluo
[1]valedochie255@gmail.com
[1]Nnamdi Azikiwe University Awka, Anambra State, Nigeria

Abstract

This study examined achievement motivation and self-concept as correlates of interest and academic achievement in Mathematics among senior secondary school students in Anambra State. A correlational research design was adopted. The sample comprised 600 Senior Secondary School II (SSII) students drawn from five local government areas in Awka Education Zone. Data were collected using three instruments: Achievement Motivation Scale, Five-Factor Self-Concept Questionnaire, and Mathematics Students' Interest Inventory. Six research questions were answered and six hypotheses were tested at the 0.05 level of significance. Reliability was established using Cronbach's alpha, yielding coefficients of 0.753, 0.771, and 0.659 respectively. Data were analyzed using Pearson Product Moment Correlation and multiple regression analysis. Findings revealed a significant positive relationship between achievement motivation and students' interest as well as academic achievement in Mathematics. Self-concept also showed a significant positive relationship with both interest and academic achievement. The joint influence of both variables significantly predicted students' interest and performance, with slight gender differences observed. The study concluded that achievement motivation and self-concept are key determinants of students' interest and academic success in Mathematics and recommended strategies to enhance motivation and positive self-concept.

Keywords: Achievement Motivation, Self-Concept, Interest Academic Achievement

Introduction

The objective of every country is to produce manpower and resourceful people that will contribute greatly to the country's growth and development. This objective cannot be achieved unless her members are educated. Education is the process of receiving or giving systematic instruction, especially at a school or university. Fafunwa (2021) in his seminar work on the history of education in Nigeria, defines education as the aggregate of all processes by which a child or adult develops the abilities, attitudes, and other forms of behavior which are of positive value to society. The process of acquiring education may be formal or informal. Informal education takes place in a natural setting like home environment while the formal education takes place in a school setting or work environment outside the home. Education comprises many disciplines that every human should be taught and equipped with. One of such disciplines is science education.

Science Education is a fusion between the elements of science and education, to produce a simplified and comprehensible concept of science that can be understood by individuals not traditionally part of the scientific community (Ayeni, 2021). Matthews (2018) defines Science Education as the teaching and learning of the concepts and processes of science. Science education is the scholarly and practical discipline concerned with the teaching, learning and assessment of science content, science process as well as nature of science (Obialor, 2018). Therefore, Science Education makes students to understand science subjects such as Biology, Chemistry, Mathematics and Physics better in a more practical manner.

Mathematics is a very importance subject that is taught from primary school to tertiary level, and is even a prerequisite to passing WAEC and getting admitted to any course in the higher institution across the nation. Mathematics is the abstract science of numbers, quantities, shapes, and patterns, and their relationships, structures, and changes. Mathematics can be broadly categorized into Pure Mathematics which focused on theoretical concepts and abstract structures, such as algebra, geometry, calculus, and number theory, then Applied Mathematics which is concerned with practical applications in fields like physics, engineering, economics, biology, and computer science. Mathematics is an abstract system built from a foundation of logical rules and axioms that enables the creation of structures used to describe relationships and phenomena (Wiles, 2017). Mathematics also plays a key role in societal equity. Mathematics is learned from primary school, and is one of the subjects the child is assess on first school leaving examination before being admitted to secondary school. Also, while in secondary school, for the child to say he has graduated from secondary school, he must have at least a credit in mathematics in his WEAC, NECO or any other national examinations he sat for.

Despite the importance of Mathematics, it is disheartening to note that student's performance in the subject in both internal and external examination have continued to fluctuate over the years (WAEC annual Report 2019 – 2024). Anxiety, fear, and low self-esteem are frequently cited as key contributors to poor performance. Students often develop a misconception that Mathematics is inherently difficult, which can lead to mathematical anxiety and a feeling of inadequacy, especially when faced with challenging problems (Malwa in Attwood 2018). Hence, there is need to

look into achievement motivation of students and how it can be improved as regards their academic achievement in mathematics.

Achievement motivation refers to the internal drive to attain goals, master tasks, and achieve success in various aspects of life. It plays a significant role in human behavior, influencing individuals to set and strive for goals, face challenges, and persist in the pursuit of success. Achievement motivation is a psychological concept that refers to the drive to accomplish tasks, achieve goals, and surpass standards of excellence. Rooted in the work of psychologists like David McClelland and Henry Murray, this concept has evolved over time to include broader applications in educational, organizational, and personal contexts. Achievement motivation has been examined in relation to various factors, including individual differences, cultural influences, and its role in fostering success across diverse domains. Being motivated keep people dynamic and gives self-respect. McClelland (2015) highlighted that motivation is not static; instead, it is shaped by a combination of intrinsic factors, like personal interests, and extrinsic factors, such as social rewards. Dweck's (2017) through her research shows that individuals with a growth mindset tend to perform better in challenging situations due to their belief in improvement through effort. Regardless of an individual academic achievement, it is still a fact that the society frowns at the level of his/her success due to gender disparity faced in the study of science courses.

Gender is a concept that refers to the roles, behaviors, identities, and expectations that societies and cultures associate with individuals base on their perceived or assigned sex at birth. It is distinct from biological sex, which refers to physical and

physiological differences like chromosomes and reproductive anatomy. Gender has been noted by researchers over the years as having impact on achievement in Mathematics and its related disciplines. Akumah (2018) stressed that science, technology and their related disciplines are male-reserved while Art and Humanities are female reserved. This belief makes boys appear to have a natural positive attitude towards science and technical subjects while girls show more inclination to Arts and Humanities, encouraging females to go rather for biology, agricultural science and home economics which they consider to be more female-friendly science subjects.

Self-concept is psychological variables that influence students' academic activity. Self-concept is a multifaceted and dynamic psychological construct that refers to an individual's perception of themselves, shaped by their experiences, social interactions, and self-reflections. Self-concept is one of the majors considered to encompass a variety of dimensions, areas, some of which are more related to certain personality aspects such as physical, social and emotional. Self-concept is defined by Nna-Kue (2023) as the totality of a complex, organized, and yet dynamic system of learned attitudes, beliefs, and evaluative judgments that people hold about themselves. Pack in Meeus et al (2015) studied how self-concept changes during the transition from adolescence into emerging adulthood, noting that self-concept is continuously redefined during this phase, influenced by new roles, relationships, personal achievements and interest.

Interest is typically viewed as a long-lasting attraction or engagement with specific topics or activities. It can emerge from curiosity, which is the innate drive to resolve gaps in knowledge or experience. Additionally, interest plays a significant role in

motivation. Hidi and Renninger (2020) explore how an individual's interest in a subject enhances their motivation to pursue and persist in learning activities. When interest is sparked, individuals are more likely to engage actively, seek additional information, and enjoy the learning process. The dynamic interplay between curiosity and interest underscores the importance of fostering both in educational settings. Interest impacts the psychological factors that contribute to academic achievement.

Academic achievement is often understood as a multidimensional construct encompassing a variety of educational outcomes. These outcomes include grades, test scores, and other measures of knowledge and skill attainment, reflecting the effectiveness of learning in various academic domains. It also refers to the extent to which a student has attained specific educational goals, often measured through assessments such as grades, standardized tests, or the completion of educational programs. Aina and Olanipekun (2016) added that academic achievement is not merely a reflection of cognitive ability but also depends on socio-emotional skills and the quality of instruction; particularly in the Nigerian context where educational challenges are prevalent. Academic achievement is a pivotal concept in education, reflecting the extent to which students meet learning goals and excel in their educational endeavors. Despite its significance, achieving academic success is fraught with challenges. In Nigeria, for example, inadequate resources, overcrowded classrooms, and unqualified teachers often hinder student performance (Aina and Olanipekun, 2016)

Statement of Problem

Mathematics is a core subject in the secondary school curriculum and serves as a foundation for careers in Science, Technology, Engineering, and Mathematics (STEM). In Awka Education zone which is the researcher's area of study, there are many Mathematics teachers. Also, many students can afford to buy the recommended Mathematics text books, yet it is observed that many of the students are still performing poorly in mathematics which is a core subjects offered by all the students at secondary school level. Research has shown that students' performance in Mathematics is influenced by different factors, such as achievement motivation, self-concept, and interest in the subject. However, in Anambra State, many students exhibit low motivation to excel in Mathematics, which contributes to their poor performance. Similarly, self-concept, or how students perceive their abilities in mathematics, plays a significant role in shaping their interest and academic achievement. Studies have established that students with a positive mathematics self-concept tend to develop greater interest in the subject and perform better. Conversely, students with a negative self-concept often experience mathematics anxiety, which diminishes their engagement and achievement. Also, a student who finds mathematics enjoyable and meaningful is more likely to dedicate time and effort to learning the subject. However, traditional teaching methods that emphasize rote learning over problem-solving and creativity have been identified as a major barrier to fostering interest in mathematics among Nigerian students. Despite these challenges, there is limited empirical research on the interplay between achievement motivation, self-concept, interest, and academic achievement in mathematics among secondary school students in Anambra State. Most studies focus on either individual

factors or general academic performance without examining the interconnections between these variables in the context of mathematics. This gap in the literature underscores the need for a comprehensive investigation to understand how these psychological and motivational constructs interact to influence students' mathematics achievement.

Therefore, the researcher seeks to explore the relationship between Achievement Motivation, Self-Concept, Interest, and Academic Achievement in Mathematics among Secondary Schools in Anambra State. By identifying these correlations, the researcher aims to provide evidence-based recommendations for educators, policymakers, and stakeholders to design interventions that enhance student's performance in Mathematics in the state and equipping students with the skills necessary for their academic and professional success.

Purpose of the Study

This study focuses on achievement motivation and self-concept as correlates of interest and academic achievement in mathematics among senior secondary school students in Anambra State. Specifically, the study sought to determine the:

1. Relationship between Achievement Motivation and student interest in Mathematics.
2. Joint Relationship between Achievement Motivation, Self-Concept and male student Interest in Mathematics.
3. Joint Relationship between Achievement motivation, Self-Concept and female student interest and motivation in Mathematics.

Research Questions.

The following research questions guided the study.

1. What is the relationship between Achievement Motivation and student interest in Mathematics
2. What is the Joint relationship between Achievement Motivation, Self-Concept and male student Interest in Mathematics?
3. What is the Joint relationship between Achievement motivation, Self-Concept and female student interest and motivation in Mathematic?

Hypotheses

The following null hypotheses guided the study and was tested at 0.05 level of significance

$H0_1$: There is no significant relationship between Achievement Motivation and student interest in Mathematics.

$H0_2$: There is no significant joint relationship between Achievement Motivation, self-concept and male student interest in Mathematics.

$H0_3$: There is no significant relationship between achievement motivation, Self-Concept and female student interest in Mathematics

Methods

This study adopted a correctional survey design. The area of the study is Awka Education Zone. It is one of the six educational zones in Anambra State. The population of the study is 5,729 senior secondary school two (SS2) Mathematics

students in the 61 public secondary schools in Awka Education Zones in Anambra State**.** The sample for the study is 600 SS2 Mathematics students selected from 30 secondary school from five of the local government area in Awka education zone**.** The researcher adopted multi-stage sampling techniques that include simple random sampling, purposive sampling and disproportionate sampling techniques. The instrument for data collection was structured questionnaire titled Achievement Motivation scale (AMS), five-factor self-concept questionnaire and Mathematics students' interest inventory (MSII)**.** The reliability of the instrument were analysed using Cronbach's alpha and the analysis coefficients were .75, .77 and .66.The analysis of the data was analyzed using pearson product moment correlation and multiple regression analysis.

Results

Research Question 1. What is the relationship between Achievement Motivation and student interest in Mathematics?

Table 1: Pearson correlation coefficient between Achievement Motivation and Interest in Mathematics

Source of Variation	N	Pearson Correlation	Sig. (2-tailed)	Remark
Achievement Motivation vs Interest in Mathematics	600	0.149**	0.000	Positive low relationship

**. Correlation is significant at the 0.01 level (2-tailed).

As shown in Table 1, Pearson's Coefficient, r = 0.149, with a p-value of 0.000. This is an indication that a low positive correlation exists between achievement motivation and interest in Mathematics among senior secondary school students.

$H0_1$: There is no significant relationship between Achievement Motivation and student interest in Mathematics.

The data in Table 1 shows that the Pearson correlation coefficient between achievement motivation and student interest in Mathematics is r = 0.149 with a p-value of 0.000. Since the p-value (0.000) is less than the alpha level of 0.05, the null hypothesis is rejected. Therefore, there is a significant relationship between achievement motivation and student interest in Mathematics.

Research Question 2: What is the joint relationship between Achievement Motivation, Self-Concept and male student Interest in Mathematics?

Table 2a: Model Summary for Male Students

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	0.273[a]	0.075	0.069	4.224

a. Predictors: (Constant), SCQ Score, AMS Score

Table 2b: ANOVA[a] for Male Students

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	469.016	2	234.508	13.146	0.000[b]
Residual	5815.513	326	17.839		
Total	6284.529	328			

a. Dependent Variable: Interest Score

b. Predictors: (Constant), SCQ Score, AMS Score

Table 2c: Coefficients[a] for Male Students

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	37.886	2.481		15.269	0.000
AMS Score	0.084	0.018	0.248	4.645	0.000
SCQ Score	0.045	0.022	0.110	2.071	0.039

3. Dependent Variable: Interest Score

As shown in Tables 2a, 2b, and 2c, the multiple correlation coefficient (R) is 0.273, with an adjusted R^2 of 0.069. This indicates that achievement motivation and self-concept jointly account for approximately 6.9% of the variance in male students' interest in Mathematics. The ANOVA result ($F = 13.146$, $p = 0.000$) shows that the

regression model is statistically significant. The regression coefficients reveal that achievement motivation (β = 0.248, p = 0.000) is a stronger predictor of male students' interest in Mathematics than self-concept (β = 0.110, p = 0.039), though both variables contribute significantly to the prediction.

$H0_2$: There is no significant joint relationship between Achievement Motivation, Self-Concept, and male students' interest in Mathematics.

The data in Table 5b show that the F-statistic for the regression model is 13.146 with a p-value of 0.000. Since the p-value (0.000) is less than the alpha level of 0.05, the null hypothesis is rejected. Therefore, there is a significant joint relationship between achievement motivation, self-concept and male student interest in Mathematics. Both achievement motivation (p = 0.000) and self-concept (p = 0.039) individually contribute significantly to predicting male students' interest in Mathematics, with achievement motivation being the stronger predictor (β = 0.248) compared to self-concept (β = 0.110).

Research Question 2: What is the joint relationship between Achievement Motivation, Self-Concept, and female students' interest in Mathematics?

Table 3a: Model Summary for Female Students

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	0.042[a]	0.002	-0.006	4.571

a. Predictors: (Constant), SCQ Score, AMS Score

Table 3b: ANOVA[a] for Female Students

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	9.801	2	4.901	0.235	0.791[b]
Residual	5599.616	268	20.894		
Total	5609.417	270			

a. Dependent Variable: Interest Score

b. Predictors: (Constant), SCQ Score, AMS Score

Table 3c: Coefficients[a] for Female Students

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	48.875	2.716		17.993	0.000
AMS Score	0.013	0.020	0.041	0.663	0.508
SCQ Score	0.003	0.026	0.006	0.099	0.921

a. Dependent Variable: Interest Score

As shown in Tables 3a, 3b, and 3c, the multiple correlation coefficient (R) is 0.042, with an adjusted R^2 of -0.006. This suggests that achievement motivation and self-concept jointly account for virtually none of the variance in female students' interest

in Mathematics. The ANOVA result (F = 0.235, p = 0.791) shows that the regression model is not statistically significant. The regression coefficients reveal that neither achievement motivation (β = 0.041, p = 0.508) nor self-concept (β = 0.006, p = 0.921) significantly predicts female students' interest in Mathematics.

$H0_3$: There is no significant joint relationship between Achievement Motivation, Self-Concept, and female students' interest in Mathematics.

The data in Table 3b show that the F-statistic for the regression model is 0.235 with a p-value of 0.791. Since the p-value (0.791) is greater than the alpha level of 0.05, the null hypothesis is not rejected. Therefore, there is no significant joint relationship between achievement motivation, self-concept, and female students' interest in Mathematics. Neither achievement motivation (p = 0.508) nor self-concept (p = 0.921) significantly predicts female students' interest in Mathematics.

Discussion

The findings of this study revealed a low positive correlation between achievement motivation and student interest in Mathematics (r = 0.149, p = 0.000). This finding is consistent with the study of Abdulmajeed and Edukasiana (2024), who examined achievement motivation as a correlate of interest in schooling among secondary school students in Ilorin Metropolis and found a significant positive relationship between achievement motivation and students' interest in schooling (r = 0.62, p < 0.05). This finding also aligns with that of Lena et al. (2016), who posited that interest in learning is characterized by enjoyment, liking, and attentiveness to information acquisition, noting that efforts should be made to help all students attain

excellent marks by piquing their interest in studying. However, the correlation coefficient in the present study (r = 0.149) is considerably lower than that reported by Abdulmajeed and Edukasiana (2024), suggesting that the relationship between achievement motivation and interest may vary depending on the specific subject matter and context. The lower correlation observed could be attributed to the fact that Mathematics is often perceived as a challenging and abstract subject, which may limit the extent to which motivation translates into genuine interest among senior secondary school students in Anambra State.

The study found a significant joint relationship among achievement motivation, self-concept, and male students' interest in Mathematics, with all three variables jointly accounting for 6.9% of the variance (Adjusted $R^2 = 0.069$, $F = 13.146$, $p = 0.000$). Achievement motivation emerged as the stronger predictor ($\beta = 0.248$, $p = 0.000$) compared to self-concept ($\beta = 0.110$, $p = 0.039$). This finding is consistent with Abiodun, Chinaka and Asanre, (2025), who examine the role of students' motivation and self-concept as predictors of mathematics performance in secondary schools in Indonesia and found that collectively, achievement motivation, self-concept, and interest accounted for 68% of the variance in Mathematics performance. However, the present study found a much lower percentage of variance explained, which may be because the present study was predicting interest, a psychological construct influenced by numerous factors not captured in the model, rather than academic performance. Nwosu, and Samuel (2022) in their study on achievement motivation and self-concept as predictor of academic achievement of secondary school students in Biology in Anambra. They found that the three variables jointly accounted for 62% of students' science learning outcomes. The lower variance explained in the present

study among male students suggests that additional factors, such as societal expectations, career aspirations, peer influence, and the quality of Mathematics instruction, may further shape their interest in the subject.

The study showed no significant joint relationship between achievement motivation, self-concept, and female student interest in Mathematics (Adjusted R^2 = -0.006, F = 0.235, p = 0.791). Neither achievement motivation nor self-concept significantly predicted female students' interest in Mathematics. This finding suggests that the psychological factors that influence male students' interest in Mathematics do not appear to operate in the same manner for female students in this context. Sharma and Kaur (2025) found that achievement motivation of adolescent female students was higher than their male counterparts, yet in the present study, this higher motivation among females did not translate into greater interest in Mathematics. Saidu, Jacob, and Danladi (2021) similarly noted that while achievement motivation, self-concept, and interest significantly predicted academic performance, their relative contributions varied, pointing to the importance of considering gender in interpreting motivational variables. The non-significant relationship for female students may be explained by the influence of cultural stereotypes regarding gender and Mathematics ability, as noted by Cheryan, Ziegler, Montoya, and Jiang (2017), who observed that cultural stereotypes which communicate that women are better suited for language learning while men are better suited for STEM-based careers can result in women having lower task values in Mathematics. Consequently, female students in Anambra State may face sociocultural barriers that prevent achievement motivation and positive self-concept from fostering their interest in Mathematics specifically. This finding highlights the need for gender-sensitive interventions in Mathematics education that

go beyond psychological variables to address the broader societal and cultural influences shaping female students' engagement with the subject.

Conclusion

Based on the findings of this study, it can be concluded that achievement motivation and self-concept play significant but modest roles in influencing Mathematics interest and academic achievement among senior secondary school students in Awka Education Zone, Anambra State. The study revealed that achievement motivation has a significant positive relationship with both student interest in Mathematics and academic achievement, though these relationships are relatively weak. This suggests that while students with higher achievement motivation tend to show slightly more interest in Mathematics and achieve better academically, achievement motivation alone is insufficient to substantially enhance Mathematics outcomes.

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