

SECONDARY SCHOOL STUDENTS SELF-CONCEPT AS A CORRELATE OF ACADEMIC ACHIEVEMENT IN BASIC SCIENCE IN JUNIOR SECONDARY SCHOOL IN AWKA EDUCATION ZONE, ANAMBRA STATE, NIGERIA

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Abstract

This study investigated Secondary school students' self-concept as a correlate of academic achievement in Basic Science in Awka Education Zone in Anambra State, Nigeria. The research design adopted for this study was correlational survey. The population of the study consists of 5,388 students in junior secondary schools in Awka Education Zone, Anambra State. Simple random sampling technique was used to draw a sample size of 150 junior secondary schools students of 2022/2023 academic session from different schools in Awka Education Zone, Anambra State. The data used for the study were collected using questionnaire and the past annual records of students in Basic Science in 2022/2023 academic session obtained from the sampled schools. Three research questions guided the study and three null hypotheses were tested at 0.05 level of significance. Data collected were analyzed using simple Linear Regression analysis. The findings of the study revealed that there is a moderate positive and significant relationship between secondary school students' self-concept and their academic achievement in Basic Science. The study also revealed that there is a moderate positive and significant relationship between male secondary school students' self-concept and their academic achievement in Basic Science and also there is a moderate positive and significant relationship between female secondary school students' self-concept and their academic achievement in Basic Science. Based on the findings of the study, the following recommendations among others were made: Educational guidance services should be made mandatory in schools and educational stakeholders should equally focus on the self-concept of both high and low achieving students.

Key words: Basic Science, Academic Achievement, Self-Concept

Introduction

Basic science is bedrock of all sciences, engineering and technology courses, which provides the fundamental understanding of natural phenomena and the processes by which natural resources are transformed. Basic science is regarded as an undifferentiated course designed to show the unity, wholeness and interrelationship of disciplines that make up science. Basic science formerly known as integrated science is the first form of science a child comes across at both primary (pupils) and junior secondary school level. It is the first point of teaching children important skills and to solve simple practical problems, which they meet later in life. In a similar affirmation, National Policy on Education in Obialor

(2021) emphasized that basic science and technology helps children to develop their skills especially their ability to handle things. The knowledge of basic science also equipped the students with the necessary means and tools to address global socio-economic and environmental challenges, such as the water crisis, infectious diseases, ocean deoxygenation and climate change.

Basic science has an important contribution to make towards a sustainable world for all, as outlined in the Sustainable Development Goals (SDGs, 2021). The learning of basic science also makes students aware of the essential means to address major challenges such as universal access to food, energy, and sanitation. Basic Science is one among subjects which expresses the fundamental unity of scientific thought (Maduabum, 2011). Irrespective of all the benefits that learning Basic Science provides, it is evident from the Basic Education Certificate Examination (BECE) in the past years that Basic Science students' results have been poor indicating a poor academic achievement (EDC, 2019).

Academic achievement, according to Nwana (2007) is defined as the attained ability or degree of competence in school tasks usually measured by standardized tests and expressed in grades based on wide sampling of students' achievement. Bell (2012) described academic achievement as the tendency to strive for success and to participate in activities in which success is dependent on a person's effort, skills, courage or perseverance and ability. Students' achievement in external examination like BECE is a good source of information about their academic achievement. According to Ibenegbu, Okoye, Adigwe & Ifesinachi (2022), the scholastic status of a student at any particular time has been defined as "academic achievement. It describes how a person can display his or her intellectual ability. This academic status might be explained by the grades earned in a particular course or set of courses. Research has shown that academic achievement is influenced by range of factors, including individual difference in cognitive abilities, motivation, environmental influences and self-concept (Spinath, 2012). Students' academic achievement such as high grades or academic recognition can positively influence their self self-concepts by boosting their self-worth and self-esteem. It equally validates their intelligence, abilities and efforts leading to positive self-concept.

Self-Concept is a general term used to refer to "how someone thinks about, evaluate or perceive oneself" (Okafor, Obialor & Osuafor, 2020). Self-concept refers to our personal knowledge of who we are, encompassing all of our thoughts and feelings about ourselves physically, personally and socially. Self-concept also includes our knowledge of how we behave our capabilities and our individual characteristics (Jackson; 2022). Self-concept encourages students or learners to develop in the study of Basic Science the necessary information needed for provoking inquisitive spirit of enquiring and practical skills for scientific investigation. It also provides the necessary framework for parents and teachers to encourage their wards to build self-confidence in themselves at school and work. It gives the policy makers and educational administrators an insight of the kind of policy to adopt to achieve optimal academic benefit for the overall interest of the country. In the context of educational development, a crucial interplay exists between academic achievement and self-concept. Students' perception of their own abilities and self-worth often play a pivotal role in determining their academic success. When individuals possess positive self-

concept, they tend to approach studies with great confidence and motivation, which can lend to improved academic outcomes. On the other hand, negative self-perceptions might hinder their ability to fully engage in their educational pursuits and academic achievement in sciences, basic science inclusive. Recognizing this intricate relationship is essential for educators and policymakers to create environment that foster both strong academic achievement and a healthy self- concept. However, according to Okafor, Obialor & Osuafor (2020), academic achievement may not primarily be an expression of learner's abilities but also factors on both gender's view of themselves.

Gender is described as the socially, culturally constructed characteristics and roles which are ascribed to males and females in any society (Okeke, 2008). It is the fact of being male or female (Quirk in Obialor, 2016). Studies have been conducted by researchers in the quest to find out the relationship between students' gender and their academic self-concept. It has been reported that 2males and females differ in their beliefs about their academic competences (Ireson & Hallan in Anierobi, 2019), with a wide gap on how males develop their self-concept as compared with their female counterparts (Hanan, Shabana & Mona, 2016). For instance, Okoye (2011) reported that girls had higher English self concept and boys had higher mathematics self concept. On the other hand, Matovu (2012) reported that female students had higher academic effort compared to their male counterparts. SarAbadaniTafreshi (2006) in their study found out that there was a significant difference in the academic achievement of male and female students while Hanan, Shabana, & Mona (2016) as pointed out earlier in their study, found a significant association between academic self-concept and academic achievement. From the above empirical studies, it may be glaring that researchers showed relentless support towards the belief that there is an undeniable relationship between gender, academic self-concept and academic achievements of students. This study, therefore, intends to provide the relationships among gender, academic self-concept and academic achievement of students in Basic Science.

Purpose of the study

The purpose of the study was to find out the secondary school students' self-concept as correlates of academic achievement in Basic Science. Specifically, the study sought to determine the;

1. Relationship between secondary school students' self-concept and their Academic achievement in Basic Science
2. Relationship between male secondary school students' self-concept and their academic achievement in Basic Science
3. Relationship between female secondary school students' self-concept and their academic achievement in Basic Science

Research Questions

The following research questions guided the study

1. What is the relationship between Students' self-concept and their academic achievement in Basic Science?

2. What is the relationship between male secondary school students' self-concept and their academic achievement in Basic Science?
3. What is the relationship between female secondary school students' self-concept and their academic achievement in Basic Science?

Hypotheses

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

1. There is no significant relationship between Student's self-concept and their academic achievement in Basic Science.
2. There is no significant relationship between male secondary school student's self-concept and their academic achievement in Basic Science.
3. There is no significant relationship between female secondary school student's self-concept and their academic achievement in Basic Science.

Methods

The research design adopted for this study was Correlational Survey. The study was carried out in public secondary schools in Awka Education Zone of Anambra State. The zone is made up of five local government areas in Anambra State. These five local government areas include; Awka South, Awka North, Njikoka, Anaocha and Dunukofia local government areas. Awka Education Zone was chosen because it is the largest educational zone containing a significant number of secondary schools in Anambra State. The population of this study comprises of 5,388 junior secondary school two (JSS2) basic science students in all the schools in Awka Education Zone. A sample of 150 students was randomly selected from ten secondary schools in Awka education Zone. The simple random sampling method was used to select the ten secondary schools to avoid all forms of selection bias, hence giving each member of the ten schools an equal chance of being selected. Therefore, 15 respondents from each of the ten schools which were selected at random which formed the sample size of the study. The instrument used for data collection was a structured questionnaire developed by the researchers. The questionnaire was tagged Self-Concept Scale. It was made up of two parts, I and II. Part 1 of the questionnaire was used to obtain personal information of the respondents. Part II was further divided into three sections containing item questions in accordance to the specific purpose of the study and research questions developed for the study. The instrument for the study was validated by three lecturers in the department of science education, faculty of Education, Nnamdi Azikiwe University, Awka. To obtain the reliability of the instrument, copies of the questionnaire was tested by administering 20 copies on students from Onitsha Education Zone using single administrative method. The data obtained from the administered questionnaire was analyzed using Cronbach's Alpha method. The reliability was found to be 0.748. The researcher went to the sampled public secondary schools and administered the questionnaire on the respondents on the spot. The data collected was analyzed using Linear Regression.

Results

Research Question One

What is the relationship between Students' self-concept and their academic achievement in Basic Science?

Table 1: Regression analysis of the relationship between secondary school students' self-concept and their academic achievement in Basic Science

Model	r	r ²	Adjusted r ²	Std. Error of the Estimate	Decision
1	.623 ^a	.388	.384	10.13715	Moderate positive relationship

a. Predictors (Constant), Students Self-Concept

The result in Table 1 shows that the correlation coefficient between secondary school students' self-concept and their academic achievement in Basic Science is .623. This indicates that there exists a moderate positive relationship between secondary school students' self-concept and their academic achievement in Basic Science. The data in the table also reveals that the coefficient of determination (r) associated with the correlation coefficient of 623 is 388. The coefficient of determination (r) indicates that 38.8% variation in secondary school students' achievement in Basic Science can be attributed to their self-concept.

Research Question Two

What is the relationship between male secondary school students' self-concept and their academic achievement in Basic Science?

Table 2: Regression analysis of the relationship between male secondary school students' self-concept and their academic achievement in Basic Science

Gender	r	r ²	Adjusted r ²	Std. Error of the Estimate	Decision
Male	.687 ^a	.472	.466	9.422444	Moderate positive relationship

a. Predictors: (Constant), Students Self-Concept

The result in Table 3 indicates that the correlation coefficient between male secondary school students' self-concept and their academic achievement in Basic Science is 687. This indicates that there exists a moderate positive relationship between male secondary school students' self-concept and their academic achievement in Basic Science. The data in the table also reveals that the coefficient of determination (r) associated with the correlation coefficient of .687 is .472. The coefficient of determination (r) indicates that 47.2% variation in male secondary school students' achievement in Basic Science can be attributed to their self-concept.

Research Question Three

What is the relationship between female secondary school students' self concept and their academic achievement in Basic Science?

Table 3: Regression analysis of the relationship between female secondary school students' self-concept and their academic achievement in Basic Science

Gender	R	r ²	r ² Adjusted	Std. Error of the Estimate	Decision
Female	.527 ^a	.278	.265	10.99505	Moderate positive relationship

a. Predictors: (Constant), Students Self-Concept

The result in Table 5 reveals that the correlation coefficient between female secondary school students' self-concept and their academic achievement in Basic Science is 527. This indicates that there exists a moderate positive relationship between female secondary school students' self-concept and their academic achievement in Basic Science. The data in the table also reveals that the coefficient of determination (r) associated with the correlation coefficient of 527 is 278. The coefficient of determination (F) indicates that 27.8% variation in female secondary school students' achievement in Basic Science can be accounted for by their self- concept.

Hypotheses

Hypothesis 1

There is no significant relationship between Student's self-concept and their academic achievement in Basic Science.

Table 4: ANOVA Regression analysis on significance of the relationship between students' self-concept and their academic achievement in Basic Science

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	9642.231	1	9642.231	93.831	.000 ^b
	Residual	15208.763	148	102.762		
	Total	24850.993	149			

a. Dependent Variable: Achievement Score

b. Predictors: (Constant), Students Self-Concept

The result in table 2 shows that at 93.831 F-value the probability value of .000 was obtained which is less than the 0.05 level of significance. Therefore, the null hypothesis was rejected. Hence, there is a significant relationship ($P < 0.05$) between students' self-concept and their academic achievement in Basic Science. This implies that self-concept made a significant contribution to students' academic achievement in Basic Science.

Hypothesis 2:

There is no significant the relationship between male secondary school students' self-concept and their academic achievement in Basic Science.

Table 5: ANOVA Regression analysis on significance of the relationship between male secondary school students' self-concept and their academic achievement in Basic Science

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6985.933	1	6985.933	78.653	.000 ^c
	Residual	7816.167	88	88.820		
	Total	14802.100	89			

a. Dependent Variable: Achievement Score

b. Selecting only cases for which Gender-Male

c. Predictors: (Constant), Students Self-Concept Scale

The result in table 4 reveals that at 78.653 F-value the probability value of .000 was obtained which is less than the 0.05 level of significance. Therefore, the null hypothesis was rejected. Hence, there is a significant relationship ($P < 0.05$) between male secondary school students' self-concept and their academic achievement in Basic Science. This implies that self-concept made a significant contribution to the male secondary school students' academic achievement in Basic Science.

Hypothesis 3

There is no significant the relationship between female secondary school students' self-concept and their academic achievement in Basic Science

Table 6: ANOVA Regression analysis on significance of the relationship between female secondary school students' self-concept and their academic achievement in Basic Science

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2698.650	1	2698.650	22.323	.000 ^c
	Residual	7011.683	58	120.891		
	Total	9710.333	59			

a. Dependent Variable: Achievement Score

b. Selecting only cases for which Gender-Female

c. Predictors: (Constant), Students Self-Concept Scale

The result in table 4 reveals that at 78.653 F-value the probability value of .000 was obtained which is less than the 0.05 level of significance. Therefore, the null hypothesis was rejected. Hence, there is a significant relationship ($P < 0.05$) between female secondary school students' self-concept and their academic achievement in Basic Science. This implies that self-concept made a significant contribution on the female secondary school students' academic achievement in Basic Science.

Discussion

The findings of the study revealed that there is a moderate positive relationship between secondary school students' self-concept and their academic achievement in Basic Science. The findings of this study is in line with the study carried out by Ajmal, & Rafique (2018) who reported that there is a significant relationship between academic self-concept and academic achievement of distance learners. This implies that positive academic self-concept of students helps them to achieve better in academics. This is also supported by Okafor, Obialor, & Osuafor (2020) in their study on secondary school students' self-concept and gender as correlates of academic achievement in Biology in Imo State who reported that there is a significant relationship between students' self-concept and academic achievement in biology.

The findings of the study also revealed that there is a moderate positive relationship between male secondary school students' self-concept and their academic achievement in Basic Science. Similarly, this finding is in line with the study carried out by Okafor, Obialor, & Osuafor (2020) who studied secondary school students' self-concept and gender as correlates of academic achievement in Biology in Imo State. The authors therefore concluded that students' self-concept can be a contributing factor towards male students' academic achievement in biology. This means that male students with positive self-concept achieve higher than the male students with negative self-concept.

Furthermore, the findings of this study also indicate that there is a moderate positive relationship between female secondary school students' self-concept and their academic achievement in Basic Science. This result is in agreement with the findings of Okafor, Obialor, & Osuafor (2020) who reported that students' self-concept can be a contributing factor towards female students' academic achievement in biology. This also means that female students with positive self-concept achieve higher than the male students with negative self-concept. However, the moderate positive relationship observed in male and female secondary schools students self- concepts and their academic achievement in basic science could be attributed to teaching methods used by their teachers during instructional delivery.

Conclusion:

Based on the findings of this study, it was revealed that self-concept has a positive and significant influence on the academic achievement of students. Similarly, the analysis showed that there is a moderate positive relationship between male and female secondary school students' self-concept and their academic achievement in Basic Science.

Recommendations

Based on the research findings and implication of the study, the following recommendations were made;

8. Both school and family involvement are needed for enhancement of students' self-concept of basic science students for better academic achievement.

9. Educational guidance services should be made mandatory in schools and educational stakeholders should equally focus on the self-concept of both high and low achieving students.
10. Self-concept should be enhanced using appropriate teaching and counseling strategies so as to boost students' self-concept in order to improve academic achievement of both male and female especially in basic science.
11. Government should set up trainings that will enlighten teachers on psychological construct such as self-concept and self-esteem.

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