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ACADEMIC SELF-CONCEPT AND ACHIEVEMENT MOTIVATION AS PREDICTORS OF SECONDARY SCHOOL STUDENTS' ACADEMIC ACHIEVEMENT IN BIOLOGY IN AGUATA EDUCATION ZONE

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ABSTRACT

The study investigated academic self-concept and achievement motivation prediction of academic achievement of secondary school students in biology in Aguata Education Zone. The design for the study was correlational survey research design. Three research questions and three hypotheses were used for the study. The research was done in Aguata Education Zone in Anambra State. The sample of the study comprised of 297 senior secondary Two Biology students. Three instruments titled Questionnaire on Academic Self-concept (QASC) developed by Liu and Wang (2005) and Achievement Motivation Scale (n-Ach) developed by pratibha Deo and Asha (1985) were adapted for data collection for the study. Students result for 2019/2020 academic session was also used as academic achievement scores for the study. Simple & Multiple linear regression was used in answering the research questions while the t-test was used for testing the research hypotheses at 0.05 level of significance. The major findings from the study showed that Academic self-concept & achievement motivation jointly and significantly predicted students' academic achievement in biology. It was recommended among other things that biology teachers should be sponsored on seminars and conferences associated with psychological construct (academic self-concept and achievement motivation) by the government so as to help them encourage the students to maintain low level of anxiety and high academic achievement. This will help in bringing those students who have no confidence to view themselves as capable and work better towards academic achievement in biology.

Keywords: Academic self–concept; achievement motivation; academic achievement; secondary school students; biology.

Introduction

Science has contributed immensely to the development of the world and has been recognized as the bedrock for modern day technological breakthrough. Science can be defined as a systematic, precise and objective way to study natural world. In recent times, countries all over the world

especially the developing ones like Nigeria are striving hard to develop technologically and scientifically since the world is turning scientific and proper functioning of lives depends greatly on science. Ogunleye (2012) posited that science is a dynamic human activity concerned with understanding the workings of our world. Science comprises basic subjects such as biology, physics, chemistry, mathematics and agriculture.

Biology is a natural science concerned with the study of life and organisms, including their structure function, growth, reproduction, metabolism, evolution, taxonomy, and the interrelationship of all living and non-living things in our environment. Nwagwuna (2011) said that biology is the epicentre of most of all the studies in the faculties of science, health, science and medicine, agriculture, engineering and technology. Despite the popularity of biology among students, most students achievements in the science especially in biology, have been very poor (WAEC result 2014-2019).Many researchers in science education have been concerned about this downward trend, and efforts to identify major factors with the aim of addressing them are being daily projected. Several researchers have pointed out different reasons for students' poor performance in biology, some of which are due to abstractness of certain aspect of biology, a lack of understanding on the students' part, certain biology concept and terminologies. However there are variables that are students-related that could be responsible for students poor achievement in biology. Some of the variables are students poor study habit, academic self-concept and achievement motivation.

Academic self-concept is the perception and evaluation that a student has or does about his or her academic abilities. It relates to how well a student performs in school. According to Izuchi and Onyekwuru (2017), Academic self-concept is a psychological concept employed to describe students' belief regarding his or her academic ability and can be used to predict the extent to which one is able to accomplish tasks successfully and unsuccessfully. This has various implications for both students' academic achievement and progress as it can serve as predictor of academic achievement. Academic self-concept can therefore be defined as how individuals perceive themselves in terms of their academics and this affect the totality of their behaviour or attitude towards school (Catherine, 2013). Academic self-concept can be seen as unique attribute or character which an individual possesses different from others. And this uniqueness makes an individual develop a strong psychological variable such as achievement motivation which could play an important role in academic achievement of students in Biology.

Achievement motivation according to Akpan and Umobong (2013) is that force which encourages and stimulates a person to carry out actions to get success. To Wani and Masih (2015), achievement motivation meant a strong psychological motive by which a person desires to excel. Achievement motivation has been consistency linked to positive academic outcome. According to Wigfield, Tonks and Klauda (2016), achievement motivation propels behaviour towards achievement. By implication, one could exert that achievement motivation is paramount for success. Achievement

motivated people seem to be concerned with their personal achievement rather than the rewards (Kumar and Bajpai, 2015). If we are really interested to improve the quality of education in our school, then we have to pay proper attention to harness the potentialities of our students by raising their level of achievement motivation and academic achievement.

Academic achievement according to Yara (2010), is defined as examination marks, teacher given grades and percentile in academic subjects. Academic achievement is one of the leading concerns of parents and other stake holders of education. All the efforts of teaching and learning are therefore targeted towards academic achievement of students around which the wheels of education revolves. In an effort to improve students' cognition and effective outcomes in biology and school achievement, educational psychologists and science teachers have continued to search for variables (personal and environmental) that could be influenced in favour of academic gains. Of all personal variables that have attracted researchers in this area of educational achievement, the academic self – concept of students and achievement motivation seems to be leading other variables. This study therefore determines whether academic self-concept and achievement motivation predict secondary school students' academic achievement in biology in Aguata Education Zone in Anambra State.

Purpose of the Study

The purpose of the study is to ascertain if students' academic self-concept and achievement motivation can predict students' academic achievement in biology among senior secondary schools' in Aguata Education Zone. Specifically, this study intends to determine:

1. If academic self-concept will predict student's academic achievement in biology in Aguata Education Zone.
2. If achievement motivation will predict student's academic achievement in biology in Aguata Education Zone.
3. If academic self-concept and achievement motivation will jointly predict students' academic achievement in biology.

Research Questions

The following research questions guided the study.

1. How does academic self-concept predict students' academic achievement in biology?
2. How does achievement motivation predict students' academic achievement in biology?
3. How does academic self-concept and achievement motivation jointly predict students' academic achievement in biology?

Hypotheses

The following null hypotheses guided the study.

1. The academic self-concept will not significantly predict students' academic achievement in biology.
2. The achievement motivation will not significantly predict students' academic achievement in biology.
3. The joint prediction of academic self-concept and achievement motivation on students' academic

achievement in biology will not be significant.

Scope of the Study

The study focuses on determining if secondary school students' academic self-concept and achievement motivation will predict their academic achievement in biology in Aguata Education Zone. The study delimited to all SS2 Students in 47 government co-educational schools in Aguata Education Zone. The choice of SS2 biology students was based on the fact that they have passed SS1 and may have developed their self-concept and achievement motivation towards learning biology. Also SS3 students are in examination class and should not be disturbed.

Research Method

The design of the study was correlational survey study. This type of study seeks to establish the relationship between two or more variables. It was aimed at determining if academic self-concept and achievement motivation predict academic achievement of secondary school students in Aguata Education Zone in Anambra State, Nigeria. The study was carried out in all the 1160 senior secondary school year two (SS2) biology students from all the 47 public co-educational secondary schools in Aguata Education Zone of Anambra State. The sample consisted of 297 SS2 students (comprising 150 male and 147 female biology students) selected from nine secondary schools in Aguata Education Zone. This was established using simple random sampling technique. Three instruments titled questionnaire on academic self-concept (QASC) developed by Liu and Wang (2005) and achievement motivation scale (n – Ach) developed by Pratibha Deo and Asha (1985) were adapted and used to collect data. The students' academic achievement scores were also used. The self-concept questionnaire consists of 30 items which included both negatively and positively worded items. The questionnaire consist of 30 items with a four point scale of strongly agree, agree, disagree, and strongly disagree. The weighing point range from 1 to 4 with strongly disagree having point 1 while strongly agree has 4 points. The achievement motivation scale consists of 29 items. There are five models of responses provided for each items – Always, frequently, sometimes, rarely, and never. The questionnaire on Academic self – concept and achievement motivation used for data collection were subjected to validation process by three experts, two from Department of Science Education and one from Measurement and Evaluation. They were requested to validate the contents of the questionnaire items in relation to the research questions to ensure that they are adequate and appropriate to elicit information required. They were also requested to vet the items of the instrument in terms of clarity of expressions and sentence structure. The experts went through the research questions and questionnaire items carefully and made necessary observations and suggestions. Some items in the questionnaires were reframed and other corrections effected in line with their suggestions. The reliability of the instrument; Academic self – concept and Achievement motivation was re – established by administering the test item to 20 students randomly selected from a school in Awka Education zone which is not part of the study area. A trial test

according to Nworgu (2015) is done on a smaller scale than the main study, but on similar conditions. The scores were calculated and the cronbach Alpha formula was employed to determine the internal consistency of the item.

After the analysis, reliability co-efficient of .79 and .70 were obtained for students self – concept questionnaire and Biology students achievement motivation questionnaire respectively. The questionnaires on self-concept and achievement motivation were administered to biology students involved in the study. The collection of data was done with the help of research assistant (biology teachers) in the selected secondary schools who were briefed and guided on the modalities for the administration and collection of data. In each school, the copies of the instruments were distributed to the sample and the completed questionnaires were collected on the spot to ensure a 100% return. The data collected were analysed using regression analysis. Simple and Multiple linear regression analysis were used to analyse data related to five (5) research questions. Multiple regressions take into account the effect of multiple independent variables on a dependent variable and determine the quantitative relationship between them.

Co efficient (r)	Prediction
0.08 and above	high
Above 0.30_below 0.80	moderate
0.30 and below	low

Inferential statistics of t-test was used to test the null hypotheses at 0.05 level of significance.
Decision rule: In testing the null hypotheses, when p-value is less than or equal to 0.05 alpha level($p \leq 0.05$),the null hypotheses was rejected otherwise, the null hypotheses was not rejected.

If the P – value $\leq$ 0.05, reject Ho If the P – value $\geq$ 0.05, do not reject

Results and Discussion

Research Question 1: How does academic self-concept predict students' academic achievement in Biology?

Table 1: Academic Self-concept as a Preditor of Students' Academic Achievement in Biology?

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.037[a]	.001	-.002	13.681

Table 1 shows the prediction of academic self-concept on students' academic achievement in Biology. The result revealed a positive relationship between academic self-concept and students' achievement scores in Biology (R = .037). Also, the result revealed that academic self-concept predicts students' academic achievement in Biology (R^2 = .001). The result implies that academic self-concept predicts 0.1% of the variance observed in students' achievement in Biology. The result indicates that an increase in academic self-concept would lead to an increase in students' academic achievement in Biology.

Hypothesis 1: Academic self-concept will not significantly predict students' academic achievement in Biology.

Table 2: Regression Analysis of Academic self-concept as a predictor of student's academic achievement in Biology

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		
		B	Std. Error	Beta	T	Sig.	Lower Bound	Upper Bound	Decision
1	(Constant)	80.025	6.669		12.000	.000	66.900	93.150	
	SSCQ	-.047	.073	-.037	-.644	.520	-.190	.096	
	Df	1, 295							
	F	.415							
	P-value	.520							Not Significant

Table 2 shows the result of the regression analysis of the prediction of academic self-concept on students' academic achievement in Biology. The result shows that academic self-concept does not significantly predict students' academic achievement in Biology. This is because the p-value (Sig. = .520) is greater than the .05 level of significance. Thus, the null hypothesis was not rejected. The regression model is y = 80.025 - .047x_1(where y is students' academic achievement in Biology and $x_1$is students' academic self-concept).

Research Question 2: How does achievement motivation predict students' academic achievement in Biology?

Table 3: Achievement Motivation as a Predictor of Students' Academic Achievement

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.286[a]	.082	.079	13.117

Table 3 shows the prediction of achievement motivation on students' academic achievement in Biology. The result revealed a positive relationship between achievement motivation and students' achievement scores in Biology (R = .286). Also, the result revealed that achievement motivation predicts students' academic achievement in Biology (R^2 = .082). The result implies that achievement motivation predicts 8.2% of the variance observed in students' achievement in

Biology. The result indicates that an increase in achievement motivation would increase students' academic achievement in Biology.

Hypothesis 2: Achievement motivation will not significantly predict students' academic achievement in Biology.

Table 4: Regression analysis of achievement motivation as a predictor of student's academic achievement in Biology

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		S
		B	Std. Error	Beta	T	Sig.	Lower Bound	Upper Bound	Decision
1	(Constant)	95.666	3.951		24.213	.000	87.890	103.442	
	BAMQ	-.197	.038	-.286	-5.135	.000	-.272	-.121	
	Df	1,295							
	F	26.369							
	P-value	.000							Significant

Table 4 shows the result of the regression analysis of the prediction of achievement motivation on students' academic achievement in Biology. The result shows that achievement motivation significantly predicts students' academic achievement in Biology. This is because the p-value (Sig. = .000) is less than the .05 level of significance. Thus, the null hypothesis was rejected. The regression model is y = 95.666 - .197x_2 (where y is students' academic achievement in Biology and x_2 is students' achievement motivation).

Research Question 3: How do academic self-concept and achievement motivation jointly predict students' academic achievement in Biology?

Table 5: Academic Self-concept and Achievement Motivation as Joint Predictors of Students' Academic Achievement in Biology?

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.293[a]	.086	.079	13.113

Table 5 shows the joint prediction of academic self-concept and achievement motivation on students' academic achievement in Biology. The result revealed a positive relationship among the variables (R = .293). Also, the result revealed that academic self-concept and achievement motivation jointly predict students' academic achievement in Biology (R^2 = .086). The result implies that academic self-concept and achievement motivation jointly predict 8.6% of the variance observed in students' achievement in Biology. The result indicates that an increase in students' academic self-concept and achievement motivation would lead to an increase in academic achievement in Biology.

Hypothesis 3: Academic self-concept and achievement motivation will not significantly predict students' academic achievement in Biology

Table 6: Regression analysis of academic self-concept and achievement motivation as joint predictors of students' academic achievement in Biology

		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		
Model		B	Std. Error	Beta	T	Sig.	Lower Bound	Upper Bound	Decision
1	(Constant)	89.898	6.668		13.482	.000	76.775	103.021	
	SSCQ	.079	.074	.063	1.074	.284	-.066	.224	
	BAMQ	-.211	.041	-.307	-5.204	.000	-.291	-.131	
	Df	2,294							
	F	13.768							
	P-value	.000							Significant

Table 6 shows the regression analysis of the joint prediction of academic self-concept and achievement motivation on students' academic achievement in Biology. The result revealed that academic self-concept and achievement motivation jointly and significantly predict students' academic achievement in Biology. This is because the P-value (Sig. = .000) is less than the 05 level of significance. The regression model is $y = 89.898 + .079x_1 - .211x_2$ (where y is students' academic achievement in Biology, $x_1$is students' academic self-concept, and x_2 is students' achievement motivation). Thus, the null hypothesis was rejected.

Conclusion

The study established that academic self- concept did not significantly predicted students' academic achievement and achievement motivation significantly predicted students' academic achievement in biology. However, academic self-concept and achievement motivation jointly and significantly predicted students' academic achievement in biology. The understanding of these variables, academic self-concept and achievement motivation will place

teachers, parents and educators in a better position to help and support students who have long been struggling with biology and other science subjects.

Recommendation

Based on the findings of this study, it was recommended among other things that biology teachers should be sponsored on seminars and conferences associated with psychological construct (academic self-concept and achievement motivation) by the government so as to help them encourage the students to maintain low level of anxiety and high academic achievement. This will help in bringing those students who have no confidence to view themselves as capable and work better towards academic achievement in biology.

REFERENCES

Akpan, I. D. and Umobong, M. E (2013), Analysis of Achievement Motivation and Academic Engagement of Students in the Nigerian Classroom. *Academic Journal of Interdisciplinary studies. 2 (3), 3*

Catherine, R, (2013). The link between academic self – concept, self – efficacy and demonstration of special abilities.From http://www.simplyefficacy.com. Retrieve April 2019.

Izuchi, M.N, and Onyekwuru, B. U (2017). Relationships among academic self – concept, academic motivation and academic achievement among college students. *European Journal of Research and Reflection in Educational Sciences 5(7).*

Kumari, N. and Bajpai, R. P (2015). Impact of E-learning on Achievement motivation and Academic performance _ A case of study of college students in Sikkim. 10th International (CABLIBER – 2015), HP University and IIAS, Shimla, Himachal Pradesh, India, INFLIBNET centre, Gandhinagar, Gujarat, India.

Nwagwuna, C. R (2011). Developing observational and drawing skills in teachers in effect conduct of biology practical. *Science teachers association of Nigeria biology panel series 1 – 9.*

Nworgu, B.G (2015). Educational research: Basic issues and methodology. (3rd ed). Nsukka, Nigeria: University Trust

Ogunleye, O. E (2012). Inter-relationship between personal factor and academic achievement in mathematics of Ebira Secondary School students in Kogi state. *Ife Psychology. An international journal 5(1) 1*

Wani, M. A and Massih, A. (2015). Achievement motivation: A study with reference to certain Demographic variables. The signage, 3 (1)

Yara,P.O(2010). Students' self-concept on mathematics achievement Retrieved from www.eurojournals.com/ejss(7August 2010).