Relationship Between Emotional Intelligence and Academic Achievement of Students in Biology in Secondary Schools in the Northern Senatorial District of Cross River State

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ABSTRACT

The study investigated emotional intelligence as predictor of secondary school students' academic achievement in Biology in Northern Senatorial district of Cross River State. The study was guided by three (3) objectives which were translated into research questions. The corresponding null hypothesis were tested to see if the emotional intelligence traits and personality traits significantly predicts academic achievement. Correlation survey design and ex-post facto research design were adopted for the study and the population for the study comprised of 12,874 students. The sample size consisted of 388 SSII students drawn using simple random sampling and purposive sampling technique to select secondary schools for the study. The instruments used for the study were EIS (Emotional Intelligence Scale) and Mock Examination. Data were analyzed using linear regression at .05 level of significance. The findings of the study revealed that all the dimensions of emotional intelligence (self-awareness, self-regulation and social skills) do not significantly predict academic achievement. Based on the findings, it was concluded that issues of academic failure should not be attributed to emotional intelligence.

INTRODUCTION

Education is the process of promoting learning or acquiring of knowledge, values, skills, beliefs and habits. Education is the process planned to foster knowledge, skills and attitude required to enable individuals cope appropriately in the environment. Education remains pivotal in the preparation of students physically, mentally, emotionally and socially to suit world of work. Education fosters and promotes individual self-realization.

The world attention is shifted towards quality and functional education in schools and for successful academic achievement of students, attention is currently been drawn to their emotions and personalities as well. Achieving educational goals such as school success requires the desire of the students to control impulses and put in hard work, as well as the ability to control emotions associated with goal pursuit. Proactive behaviours to enhance academic success amongst students is a thing of the past as students nowadays revolt against test taking, assignment and examination and will even threaten teachers; a situation resulting to questions about students' emotions and personalities in determining academic achievement (Ghasemzadeh & Azizreza, 2015).

Understanding emotional intelligence and personality traits by students and sustaining them positively is very crucial as such will make it appropriate analyzing students' reasons for failure and adjusting to proper measures that will help in predicting academic achievement (Abakpa & Iji, 2011). Emotional intelligence and personality share common features; they both follow a relatively constant pattern throughout the individual's life, and they are all genetically determined in different degrees. In addition, they can act as important predictors of different outcomes in life including educational achievement, occupational performance, and health.

Knowing who someone is, what we want, where we want to be is important in academics. This portrays students who are self-aware. Most students set unachievable goals and having unrealistic ideas of how tasks could be performed as a result of lack of conscientiousness of what they want to achieve. Students' lack of conscientiousness in their education is over growing; hence, they tend not to be determined, lack diligences, increase lateness to school and perpetuate disorder fostering a poor achievement state of affairs.

In life, certain behaviours are exhibited by an individual that others tend to say the person has good characters or bad characters. These traits include self-awareness, self-regulation, empathy, social life, openness, extraversion, agreeableness conscientiousness and neuroticism. These characters tell about one's personality that determines success in life endeavors. Many people are good listeners, open minded, they handle criticism without denial or blame, excuse or anxiety, empathies with people, apologies when wrong, self-discipline and live social life. These categories of people are described as been emotionally balanced.

Emotional intelligence exhibits the special power to predict people and it is used as a vital tool to influence success in life (Yahaya, Yahaya & Lee, 2014). In other words, it has the power to control one's feelings and excitements. Emotional intelligence directs the recognition and differentiation of feelings, excitements, meanings and concepts, which can permit problem solving. Emotional intelligence incorporates the commitment to receive emotions, coordinate emotions to understand the information associated with emotions for management purpose. In the educational system, identification of concepts and meaning appropriately as a result of emotional intelligence will help in predicting students' academic achievement.

The emotional abilities and perception affect students in respect to cognitive and behavioral abilities. Apart from these essential qualities, emotional intelligence has different dimensions such as self-awareness, self-regulation, social skills, empathy and motivation (Goleman 1998). These dimensions are briefly explained.

Self-awareness is a key component of emotional intelligence. Self-awareness is the level to which people are consciously aware of their internal states, their communication or relationships with others (Brinker, Chin, & Wilkinson, 2014). Self-awareness is made up of emotional awareness, self-assessment, and self-confidence. In other words, it is all about understanding one's emotions, personal strength and weaknesses and having a strong sense of your own value. Malecki (2009) accepted that emotional intelligence is pivotal to effective learning. A student with self-awareness and internally motivated will definitely poses high level of academic achievement.

Self-regulation is learning how to control one's own emotions. Management of emotions is closely related to self-control, in which a child learns to delay their own gratification in support of their future success (Johnson 2015). The ability to manage emotions is important for classroom success where students learn how to interact and relate reasonably within the academic environment while keeping in focus learning (Hammed 2016). In a situation where students regulate activities that will not help them in the classroom and redirect their attention to the classroom, there is every possibility that changes to foster academic achievements are bound to take place hence, prediction of the students' academic achievement may not be a difficult task.

Social skills are the abilities to affect others positively and develop trust and rapport in relationships. Specific behaviors associated with social skills include feeling the emotional needs of others, making others feel comfortable, showing understanding, and building positive relationships (Nelson & Low, 2017). Social skills showcase skills adopted to communicate and relate with each other, both verbally and non-verbally, through gestures, body language and our personal appearance. Social skilled individual exhibit diverse approaches in solving daily personal and interpersonal problems. They are more prudent in their social relationships hence successful academic achievement. The students with social skills find more pleasure in activities they are involved and equally take decisions on their own. Social skills help in affecting others positively thereby students who tend to be low in academic achievement may relate with those who are academically high and may cope in certain areas.

Biology is a natural science that deals with the living world: How the world is structured, how it functions and what these functions are, how it develops, how living things came into existence, and how they react to one another and with their environment (Umar, 2016). It is a prerequisite subject for many fields of learning that contributes immensely to the technological growth of the nation (Ahmed, 2014). The development covers areas like Agriculture, Medicines, Nursing, Forestry, Pharmacy, Biotechnology, Nanotechnology, and many other areas (Ahmed & Abimbola, 2017). Biology is one of the subjects in Nigerian secondary school curriculum to be offered.

Achievement in the opinion of Iji (2013), Kurumeh, Musa and Agwagah (2016) and Abakpa (2011) is the measure of accomplishment in a specific field of study. The authors argue that achievement of students is the demonstration of their abilities to attain certain level of instructional objectives outcome of their classroom instruction and experiences. The students' emotions and personality traits may be influenced on the basis of experiences and should not be neglected because it fosters academic achievement. Neglecting the learners' emotion and personalities while selecting the content of any subject signifies neglecting a very vital motivational factor in the teaching-learning process that can affect learning (Okebukola 2018). It is on this premise that the researcher wants to find out how emotional intelligence can predict secondary school students' academic achievement in Biology in Northern senatorial district of Cross River State.

Statement of the Problem

Emotional intelligence dimension such as self-awareness, self-regulation and social skills are crucial to students' academic achievement. All these conditions if developed and enhanced by students; tend to help foster or enhance successful academic achievement in which Biology is inclusive. However, available records show that from 2014 to 2018, there were poor performances of students in the three science subjects with the average performances of 46.30% in Chemistry, 37.27% physics and 39.3% in Biology (Sakiyo & Badau, 2015).

The rate of failure in Biology year in and out has not only affected the turnout of students into tertiary institutions but has equally affected the development of the nation in biological areas like Medicine, Biotechnology and Genetics. The failure rate has equally prompted educators, parents and the society at large to ask questions whether secondary school students know what they want, their strengths and weaknesses, whether they do self-assessment, regulate certain detrimental behaviours and set principles to monitor their set goals, whether the students develop learning relationship with teachers and among themselves and are conscious about their time to study. Teachers and counselors keep doing their best to teach and counsel students on how to promote academic performance and most authors have written books as guide to help students out of this ugly situation. The crucial questions at this point are; do students put in self-effort (motivation)? Do they show discipline? Do they act dutifully? Are they achievement-striving and above all, do they give credence to intellectual curiosity and broadmindedness to accept constructive criticism avoiding unnecessary argument? By implication, when students act negatively upon their emotions, it will affect their performances that administrators and parents may not be able to predict their academic achievement; it may reduce students performances calling for questions about their emotional intelligence and personalities, hence the researcher intends to examine emotional intelligence and personality traits as predictors of secondary school students' academic achievement in Biology in Northern senatorial district of Cross River State.

Objectives of the Study

The main objective of this study was to determine the relationship between emotional intelligence and academic achievement of students in Biology in secondary schools in the Northern Senatorial District of Cross River State.

Specifically, this study determined how: -

1. Self-awareness predicts students' academic achievement in Biology

2. Self-regulation predicts students' academic achievement in Biology

3. Social skills predicts students' academic achievement in Biology

Research Questions

The following research questions were raised to guide the study.

1. How does self-awareness predict students' academic achievement in Biology?

2. How does self-regulation predict students' academic achievement in Biology?

3. How do social skills predict students' academic achievement in Biology?

Statement of Hypotheses

The following hypotheses were formulated to guide the study and would be tested at 5% level of significance.

1. Self-awareness does not significantly predict students' academic achievement in Biology

2. Self-regulation does not significantly predict students' academic achievement in Biology

3. Social skills do not significantly predict students' academic achievement in Biology

METHODOLOGY

Survey research design and ex-post facto also known as casual comparative design were adopted for the study.   The study was carried out in Northern Cross River State. The population of the study comprises all the 12,874 Biology students in public secondary schools in the Northern Senatorial district of Cross River State who sat for mock examination in 2018. The sample size for the study was 388 Biology students out of 12,874 SSII students that sat for mock examination in 2018 in the Northern Senatorial district of Cross River State using Taro Yamane (1973) formula for sample size determination. Purposive or judgmental sampling was used to select four (4) secondary schools from each Local Government in the Senatorial district that satisfy predetermined criteria (not malpractice prone) to give real information of the students' academic achievement.   Two instruments were used for data collection. The two instruments were Emotional Intelligence Scale (EIS) and Mock Examination results (MER) obtained from the sampled schools. The EIS contains five (5) clusters with four (4) items each based on their dimensions to measure emotional intelligence of students in Biology while the MER was collected from the various schools sampled. The MER carries grading following the West African Examination Council grading pattern as follows A1 (75-100) Excellent B2 (70-74) Very good B3 (65-69) Good C4 (60-64) Credit C5 (55-59) Credit C6 (50-54) Credit D7 (45-49) Pass E8 (40-44) failed F9 (0-39). Responses collected using the first two instruments were coded into the statistical packages for social science (SPSS) and analyzed. The results were used to compare with the secondary school students' academic achievement in Biology. The emotional intelligence scale and personality scale adopted carried a rating scale of Strongly Agree (SA) 4 points, Agree (A) 3 points, Disagree (D) 2 points and Strongly Disagree (SD) 1 points. The emotional intelligence scale and personality scale were subjected to face and content validation by an expert in measurement and evaluation, and in guidance and counseling from the Department of Guidance and counseling, College of Agricultural and Science Education, Joseph Sarwuan Tarka University, Makurdi, Benue State and a Biology teacher in secondary school. The experts were requested to check the appropriateness of the personality scale and emotional intelligence scale for collection of students required responses. The Validators comment(s) were strongly adhered to as corrections were made before final production of the instrument. To establish the reliability of the instrument, the instrument was trial-tested among 20 senior secondary school students in Benue State with similar characteristics to that of the study population. The data collected were subjected to statistical analysis using the Cronbach Alpha method to determine the internal consistency of the instrument. The reliability of the instrument was determined in clusters. Emotional intelligence scale had five clusters (1-5) and the first cluster has a reliability index of .856, cluster 2 has .854, cluster 3 has .756, cluster 4 has .836, and cluster 5 has .731. The overall reliability index for the emotional intelligence scale is .946 which is acceptable. Data collected were analyzed using linear regression to answer the research questions and the test of ANOVA that emanated from linear regression analysis was used to test the hypotheses at .05 level

of significance. The decision rule for the hypotheses was when the p value is less than the level of significance (P< 0.05) you reject the stated hypotheses but when the p value is greater than the level of significance (P> 0.05) you do not reject the stated hypotheses. Regression analysis is a form of predictive modeling technique which investigates the relationship between a dependent (target) and independent variables (predictor).

RESULT AND DISCUSSION

This section presents results of the analyzed data and discussion of findings in the sequence of the research questions answered using linear regression and hypotheses tested using the ANOVA that emanated from linear regression at .05 level of significance. The R^2 value in every module summary is used to explain the relationship that exists between the dependent and independent variables.

Research Question 1

How does self-awareness predict secondary school student's academic achievement in Biology?

To answer this question, achievement scores of students in Biology was used to predict the response from Self-awareness items.

Table 1: Regression Analysis of Students Self-awareness and Relationship with Academic Achievement in Biology

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.053ª	.003	.000	1.90423
a. Predictor: Self- awareness				

Table 1 shows the model summary of regression analysis of students' self-awareness which determines the relationship that exists between self-awareness and secondary school students academic achievement in biology. The R value .056 indicates that there is low relationship between openness and students' academic achievement in Biology. The R^2 value of .003 implies that 3% of students' self-awareness is associated or related to students' academic achievement in Biology.

Research Hypothesis 1

Self-awareness does not significantly predict secondary school students' academic achievement in Biology.

To test this hypothesis, the data collected for self-awareness and students' academic achievement test in Biology was analyzed using linear regression and the ANOVA from the linear regression was used to test the hypothesis.

Table 2: ANOVA from Linear Regression to Predict Students Self-awareness and Academic Achievement

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	3.969	1	3.969	1.094	.296ᵇ
1	Residual	1399.671	386	3.626		
	Total	1403.639	387			

a. Dependent Variable: Achievement

b. Predictors: (Constant), Self awareness

Table 2 shows the ANOVA value used for predicting students' academic achievement through self-awareness. The p-value of .296 is greater than the 0.05 level of significance, hence the test is not statistically significant and the null hypothesis which states that self-awareness does not significantly predict secondary school students' academic achievement in Biology is not rejected.

Research question 2:

How does Self-regulation predict secondary school students' academic achievement in Biology?

To answer this question, achievement scores of students in Biology was used to predict the response from Self-regulation items.

Table 3: Regression Analysis of Students Self-regulation and Relationship with Academic Achievement in Biology

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.002[a]	.001	-.003	1.90692

a. Predictor: Self- regulation

Table 3 shows the model summary of regression analysis of students' self-regulation which determines the relationship that exists between self-regulation and secondary school students academic achievement in biology. The R value .002 indicates that there is low positive relationship that exists between students' self-regulation and academic achievement in Biology main while the R^2 value of .001 implies that 0.1% relationship exists between self-regulation and students' academic achievement in Biology.

Research hypothesis 2:

Self-regulation does not significantly predict students' academic achievement in Biology?

To test this hypothesis, the data collected for self-regulation and students' academic achievement test in Biology was analyzed using linear regression and the ANOVA from the linear regression was used to test the hypothesis.

Table 4: ANOVA from Linear Regression to Predict Students Self-regulation and Academic Achievement

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	.004	1	.004	.001	.972[b]
1	Residual	1403.635	386	3.636		
	Total	1403.639	387			

a. Dependent Variable: Achievement

b. Predictors: (Constant), Self-regulation

Table 4 shows the ANOVA value used for predicting students' academic achievement through self-regulation. The p-value of .272 is greater than the 0.05 level of significance, hence the test is not statistically significant and the null hypothesis which states that self-regulation does not significantly predict secondary school students' academic achievement in Biology is not rejected.

Research question 3:

How do social skills predict students' academic achievement in Biology?

To answer this question, achievement scores of students in Biology was used to predict the response from social skills items.

Table 5: Regression Analysis of Students Social Skills and Relationship with Academic Achievement in Biology

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.052[a]	.008	.005	1.89940

a. Predictor: Social Skills

Table 5 shows the model summary of linear regression analysis of social skills of students' that determines the relationship that exists between secondary school students academic achievement in Biology. The R value .052 indicates that there is low positive relationship of social skills with academic achievement in Biology. The R^2 .008 implies 8% relationship exists between social skills and students' academic achievement in Biology.

Research hypotheses 3:

Social skills do not significantly predict students' academic achievement in Biology?

To test this hypothesis, the data collected for social and students' academic achievement test in Biology was analyzed using linear regression and the ANOVA from the linear regression was used to test the hypothesis.

Table 6: ANOVA from Linear Regression to Predict Students Social Skills and Academic Achievement

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.054	1	11.054	3.064	.081[b]
	Residual	1392.585	386	3.608		
	Total	1403.639	387			

a. Dependent Variable: Achievement

b. Predictors: (Constant), Social Skills

Table 6 shows the ANOVA value used for predicting students' academic achievement through social skills. The p-value of .081 is greater than the 0.05 level of significance, hence the test is not statistically significant and the null hypothesis which states that social skills does not significantly predict secondary school students' academic achievement in Biology is not rejected.

Summary of Major findings

The following findings were drawn from the study based on the hypotheses tested at .05 alpha level of significance.

1. The findings revealed self-awareness does not statistically significantly predict secondary school students' academic achievement in Biology.

2. That self-regulation does not statistically significantly predict secondary school students' academic achievement in Biology.

3. That social skills do not statistically significantly predict secondary school students' academic achievement in Biology.

4. That empathy does not statistically significantly predict secondary school students' academic achievement in Biology.

Discussion of Findings

The discussion of findings of the study is done based on the individual revealed outcome for the hypotheses tested.

The findings on research hypotheses one revealed that self-awareness does not significantly predict secondary school students' academic achievement in Biology and the result is in line with the work of Safdar & Gulap (2013) who found out that there is no significant relationship between self-awareness and students' academic achievement. However the findings disagreed with the findings of Melvin (2018), Nwadinigwe (2012) and Malecki (2009) whose findings revealed that there is a significant relationship between self-awareness and students' academic achievement. The difference observed in the current study may be due to some factors like teachers' qualifications and environment of learning and socio-economic factor of parents as well as study habits of students.

Also, the findings revealed self-regulation does not statistically significantly predict students' academic achievement in Biology. This finding negates the work of Nwadingwe (2012) and Melvina (2018) whose finding revealed there is a significant relationship between self-regulation and students' academic achievement. The difference observed could be as a result of the scope, population and individual differences of the students.

In addition, the findings revealed that social skills do not significantly predict students' academic achievement in Biology. This disagrees with the work of Nwadinigwe (2012) and Fatum (2008) that revealed a positive significant relationship between emotional intelligence and academic achievement among the general school students. The present findings may be due to peer problems, unpreparedness during instructional periods, unable to engage cooperative learning and disruptive classroom.

Conclusion

The study was on Emotional intelligence as predictors of secondary school students' academic achievement in Biology in Northern Senatorial district of Cross River State. Based on the findings of this study, it was concluded that emotional of students do not predict academic achievement, therefore self-awareness, self-regulation and social skills are not sole determinant factor of students' academic achievement.

Recommendations

Based on the findings of this study, the following recommendations were made.

1. Academic failure of students should not be attributed to emotional intelligence and personality traits of students.

2. Factors that could predict achievement like teachers' qualification, students study habit, learning environment and socio-economic status of parents be researched on.

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