



EMOTIONAL INTELLIGENCE AS DETERMINANT OF BIOLOGY ACHIEVEMENT AMONG SECONDARY SCHOOL STUDENTS IN AGAIE, NIGER STATE, NIGERIA

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Abstract

The study attempted to find out whether Emotional Intelligence can determine Secondary School students' academic achievement. Two research questions and two corresponding null hypotheses guided the study. Correlational research design was employed. Instruments used are the researcher's designed Emotional Intelligence Questionnaire (EIQ) for data collection and SSII Biology Students' achievement test result was used as criterion or dependent variable. The Questionnaire was validated by experts and the reliability coefficient of 0.78 was obtained. Sample size of the study comprised of two hundred and fifty (250) SSII Biology students. Hypothesis one was tested using Linear Regression while hypothesis two was tested using Kendall's Tau_B statistical tools. The result obtained showed that students with high emotional intelligence had higher academic achievement scores than those with low emotional intelligence indicating that emotional intelligence is a determinant of secondary school students' academic achievement. It is recommended that emotional intelligence should be included in curriculum of Nigerian secondary schools and also that, parents should pay more attention to the development of emotional intelligence of their children right from the family level especially the male children.

Key words: Correlation, Emotion, Examination, Intelligence, Promotion, Result and Students

Introduction

The minimum required grade for obtaining admission into high institution of learning in Nigeria is C6. Other grades especially D7, E8 & F9 are considered failed grades and are not considered for admission into higher institutions of learning in Nigeria. This implies that school cannot neglect the development of academic domains and other personal factors contributing to the success of students if the above educational objective is to be achieved (Nelson & Low, 2013). By implication, schools need to build high-achieving, productive and healthy students. In relation to the foregoing, Okonkwo (2014), opined that educators must not leave any stone unturned if the educational objectives are to be judiciously achieved. This can easily be done through a balance in the cognitive and emotional domains of the students. On this basis, Abdulrahman (2016), suggested that both emotional and cognitive domains of students' academic development should be the primary goal for educating students.

Emotional Intelligence is the capacity for recognizing our own feelings and those of others, for motivating ourselves, and for managing emotions well in us and in our relationships. Emotional intelligence is necessary for improving performance and psychological well-being of the students in school. If emotional intelligence skills are properly developed, strengthened and enhanced, students will be able to demonstrate increased levels of personal, academic and career achievement (Awolaju, 2015). Emotional intelligence brings new depth to the understanding of human intelligence as well as expanding the ability to evaluate one's general or overall intelligence. Nelson and Low (2013), identified the need for more effective development of emotional intelligence skills when they stated that the qualitative, holistic, emotive and subjective experiences of students are critical to healthy growth and development. Emotional development of students does not seem important until behaviour becomes problematic. Familiar examples are under-achievement, bullying, school violence and absenteeism. It is on the basis of the foregoing that the present study sought to determine "Relationship between Emotional Intelligence and Academic Achievement among Secondary School Biology Students in Agaie, Niger State".

Biology which is one of the major branches of science has been defined in different ways by different researchers. It is defined as the study of structure and function of living things (Lawal, 2014). It is also seen to be concerned with the study of structure, behavior, distribution and origin of living organisms and relationship between living organisms and their environment (Awolaju, 2015). On the other hand, Umoru (2016), referred to Biology as the study of living organisms (plants and animals). Implicitly, Biology is a broad branch of science concerned with the study of structure and function of living organisms as well as the interdependent relationship between living organisms and their environments.

Based on the above definitions of Biology, it has become an obvious fact that Biology must be properly taught right from the secondary school to be able to effectively utilize the importance of the knowledge of Biology. This therefore, calls for high achievement in Biology by students of that level of education. Unfortunately, research studies reveal that Biology achievement of secondary school students in Nigeria has consistently been below average. Both NECO (2019), and WAEC (2018), asserted that there has been a mass decline in Biology achievement of students at Senior School Certificate Examination (SSCE) conducted by National Examination Council (NECO) and West African Examination Council (WAEC). Researchers like Okonkwo (2014), Musa (2015), and Mohammed (2015), asserted that poor academic achievement among secondary school students is usually attributed to the school authority and teachers' attitude to work. Ukoh and Oboshi (2016), and Olaiya (2018), on the other hand asserted that poor quality of teachers and students' attitude towards education is one of the factors responsible for secondary school students' poor achievement at SSCE. Specifically, Isiugo-Abanihe *et al* (2010), Arli and Hartel (2011), Cook and Gail (2011), Awolaju (2015), as well as Abdulrahman (2016), all linked the major cause of Biology students' poor achievement to the students' emotional intelligence. Abdulrahman (2016), reported that students with low emotional intelligence show some adjective challenges and are mostly unable to handle effectively the demands of school work. Such students might not be capable of attaining personal goals which include high academic achievement.

On literature review, Maizatul *et al.*, (2012), investigated the influence of Emotional Intelligence on academic achievement among students of Education Faculty, Universiti Teknologi Mara (UiTM). Data of this research were obtained through the use of a questionnaire which elicits information on the students' Emotional Intelligence level as well as their academic performance. The results of the study revealed that the respondents have high level of Emotional Intelligence. Two domains of Emotional Intelligence (*Self-Emotion Appraisal* and *Understanding of Emotion*) were investigated and found to be significantly and positively associated with the respondents' academic achievement. The findings of the study hold important implications on the value of Emotional Intelligence and their relationships to students' academic performance especially among pre-service teachers.

On the other hand, Grace (2012), investigated emotional intelligence and gender as predictors of academic achievement among 163 undergraduate psychology students in the University of the West Indies (UWI). The results revealed significant positive and negative correlations among academic achievement, emotional intelligence components and gender. The study also reported that, using the stepwise multiple regression analysis, it was found that emotional intelligence contributed 40% ($Rsq = 0.396$) to the variance in academic achievement while simple regression analysis revealed that gender also contributed 5% ($Rsq = 0.048$) to academic achievement and these results were significant indicating that both emotional intelligence and gender predicted academic achievement but emotional intelligence was a better predictor of academic achievement than gender. The Independent t-test analysis also revealed gender disparity in academic achievement and attending to emotions in favour of girls.

In addition, Maliha and Rehana (2010), conducted a correlational study aimed at examining the relationship of Emotional Intelligence (EI) with gender, age and academic achievement of students of International Islamic University Islamabad (IIUI). The predictor variable was emotional intelligence and criterion variable was academic achievement as measured by students' Cumulative Grade Point Average (CGPA). Emotional intelligence was measured using Emotional Quotient Inventory (EQI). Correlation analysis, regression analysis and t-test were performed to test the hypotheses. Results indicated a significant correlation between emotional intelligence and academic achievement. Emotional intelligence was found to be a significant predictor of academic achievement. No significant correlation was found between age and emotional intelligence. The result also revealed no difference in the mean EQI scores of male and female students except on stress management scale where male students scored higher than female students.



Statement of the Research Problem

It is no longer news that poor academic achievement of secondary school students in Nigeria has been a major source of worry to stakeholders and policy makers in the education sector (Federal Republic of Nigeria, 2014) has therefore taken some measures to address this ugly and national challenge affecting the educational sector. Measures taken by the government at various levels to address this national challenge include the need to develop the emotional intelligence of the students' right from secondary school level of education. This is because, a well-developed emotional intelligence of students determines their ways of thinking, recognizing and expressing feelings about what they are taught. Emotional intelligence influence what the students do, how they do it, how they look and feel as well as how they comprehend what they are taught. It is therefore, necessary to address the ugly trend of poor academic achievement among secondary school students by developing and enhancing their emotional intelligence. It is on the basis of the foregoing that this study was conducted to determine whether emotional intelligence can determine the Academic Achievement among Secondary School Biology Students in Agaie, Niger State.

Aim and Objectives of the Study

The aim of this study is to determine whether emotional intelligence can determine the Academic Achievement among Secondary School Biology Students in Agaie, Niger State. The specific objectives of the study are to determine the:

1. relationship between emotional intelligence and achievement in Biology among secondary school students in Agaie, Niger State
2. relationship between emotional intelligence and gender achievement in Biology among secondary school students in Agaie, Niger State.

Research Questions

To achieve the objectives of the study the following research questions were raised to guide the study:

1. what is the relationship between emotional intelligence and achievement in Biology among secondary school students in Agaie, Niger State?
2. what is the relationship between emotional intelligence and gender achievement in Biology among secondary school students in Agaie, Niger State?

Research Hypotheses

The following null hypotheses were formulated and tested at 0.05 significance level

- HO₁:** There is no significant relationship between emotional intelligence and achievement in Biology among secondary school students in Agaie, Niger State.
- HO₂:** There is no significant relationship between emotional intelligence and gender achievement in Biology among secondary school students in Agaie, Niger State.

Research Methodology

Research design employed for this study is Correlational research design. This design enabled the researchers to correlate the Biology achievement and Emotional Intelligent of the students. Students' immediate past promotion examinations result (Ex-post facto) conducted by Niger state ministry of education was used as criterion or determinant variable. The sample size for this study consists of two hundred and fifty (250) Senior Secondary (SSII) students (128 male and 122 female). The two instruments used for the study are: Emotional Intelligence Questionnaire (EIQ) and SSII Biology Students' Immediate Past Promotion Examination Result (BIOSIPPER).

Emotional Intelligence Questionnaire (EIQ) was used to collect data on the Emotional Intelligence of students and it consist of two sections which are sections A and B. Section A is about the bio-data of the respondents (students) while section B consists of questions on the Emotional Intelligence of the students and it is based on five levels of commitment of the students. The five levels of commitment used is Likert scales which are Strongly Agree (SA), Agree (A), Undecided (UN), Disagree (DA) and Strongly Disagree (SD). The levels are rated as follows: SA = 5mks, A = 4mks, UD = 3mks, DA = 2mks, and SD = 1mk. The students responded to the items by putting a mark (✓) in any of the boxes that were placed against each item that best described their view or option.

Emotional Intelligence Questionnaire (EIQ) was validated by three experts and the suggestions, corrections and recommendations of the experts were used to produce the final copy of the questionnaire. A pilot test was conducted using split half technique to determine the reliability coefficient of the instrument (Emotional Intelligence Questionnaire). Data collected during pilot test were analyzed using Pearson Product Moment Correlation Coefficient (PPMCC) statistical tool. Reliability coefficient of 0.78 was obtained indicating that the instrument is consistent and reliable and was used for the study. The Emotional Intelligence Questionnaire was administered on the students from each of the schools after the researcher was granted permission to use the schools for the study. The researcher and the Biology teachers in each of the schools addressed the SSII students on the aim and objectives of the study so that they should be serious, honest and sincere in their responses as well as feel free to express themselves. Thereafter, the questionnaires were administered on the students. The filled questionnaires were collected from students and handed over to the researcher. The criterion or dependent variable which was the SSII Biology Students' Immediate Past Promotion Examination Result (BIOSIPPER) of each of the student used for the study was collected from their respective schools (from the examinations office) and used as the students' achievement scores. Data collected through Emotional Intelligence Questionnaire (EIQ) and SSII Biology Students' Immediate Past Promotion Examination Result (BIOSIPPER) was analyzed using Linear Regression, and Kendall's Tau_B statistical tools.

Results

To achieve the objectives of this study, the data collected were analyzed based on the hypotheses formulated and presented as follows:

Hypothesis I

HO₁: there is no significant relationship between emotional intelligence and achievement in Biology among secondary school students in Agaie, Niger State

Table 1a: Linear Regression on Emotional Intelligence and Achievement in Biology among Secondary School Students in Agaie

Model	R	R Square	Adjusted R Square	Std. Error of The Estimate
1	.846*	.668	.665	6.448

a. Predictor: Emotional Intelligence

b. Dependent Variable: Immediate Promotion Examination Result

Table 1a shows the linear regression coefficient of emotional intelligence and academic achievement of SSII Biology Students. The result shows $r(1,248) = 0.846$, $r^2 = 0.668$, which indicates that emotional intelligence is a predictor of Biology achievement among secondary school students. Therefore, the null hypothesis one is rejected. The r^2 of 0.668 indicates that 67.0% of the total Biology achievement of secondary school students was accounted for by the emotional intelligence.

To determine whether emotional intelligence is a good predictor, regression ANOVA analysis was conducted and the result is presented in table 1b

Table 1b: Linear Regression ANOVA on Emotional Intelligence and Achievement in Biology among Secondary School Students in Agaie

Model	Sum of Square	df	Mean Square	F	Sig.
1 Regression	64.440	1	64.440	32.220	.000*
Residual	55.540	248	32.9.01		
Total	119.980	249			



• = Significant

Table 1b shows the Linear Regression ANOVA on emotional intelligence of Biology achievement among secondary school students. The result indicates a significant relationship between predictor (emotional intelligence) and dependent variable (Biology achievement among secondary school students). $F(1,248) = 32.220$, $p(.000)$, $p < 0.05$. This therefore, indicates that emotional intelligence is a good predictor of Biology achievement among secondary school students. Furthermore, the regression coefficient indicates that, an increase of any unit of emotional intelligence caused a corresponding increase in Biology achievement among secondary school students. Therefore, emotional intelligence in this context has significantly determined Biology achievement among secondary school students.

Hypothesis 2

H_{O_2} : There is no significant relationship between emotional intelligence and gender achievement in Biology among secondary school students in Agaie, Niger State.

Table 2: Kendall's Tau_b analysis of Relationship between Emotional Intelligence and Gender Achievement in Biology among Secondary School Students in Agaie

		Emotional Intelligence	Gender
Kendall's Tau _b	Emotional Intelligence	Correlation Coefficient	1.000
			.086
	Intention	Sig. (2-tailed)	-
		N	250
			250
Gender		Correlation Coefficient	.081
			1.000
		Sig. (2-tailed)	.149
		N	250
			250

Table 2 show $r = .086$, $p\text{-value} = 0.149$ indicating that $P > 0.05$. Therefore, the null hypothesis two was not rejected. The correlation coefficient ($r = 0.086$) further shows that there is a positive relationship between gender and emotional intelligence of secondary school students. Hence, gender has no significant effect on Biology achievement among secondary school students. Therefore, there is a significant relationship between gender and emotional intelligence of Biology students.

Discussion of Results

The study was conducted to determine whether emotional intelligence can determine Biology achievement among secondary school students in Agaie, Niger State. In order to achieve the objectives of the study, the data collected were analyzed using Linear Regression and Kendall's Tau_B statistical tools. Table 1a reveals that there is a very high positive correlation between emotional intelligence and Biology achievement of Secondary School students. This result is in line with the findings of Nelson and Low (2013): Musa (2015), as well as that of Ukor and Oboshi (2016), who also reported a significant positive correlation between emotional intelligence and academic achievements of students. The result is also in agreement with the findings of Nwadinigwe and Azuka-Obieke (2012), who reported is a positive and significant relationship between emotional intelligence and academic achievement of students. The result implies that a person who is in a stable emotion tends to think positively and achieve better than the person in an unstable emotion during teaching and learning. When a student is emotionally destabilized, he or she cannot think and concentrate properly during teaching and learning. This is the reason why children who are not well catered for or are maltreated at home do not achieve well in the school because they are emotionally unstable. This finding is in support of the fact that there is close connection between affective domain and the cognitive domain of learners. Whatever happens to the affective domain of a student would definitely affect the cognitive domain of the particular student. Therefore, in finding solutions to the poor academic

achievement of students in Biology, proper attention needs to be directed towards development of the affective domain of the students.

In table 2, the result indicates a significant relationship between the emotional intelligence and gender among secondary school students. This result is in line with the findings of Ukor and Oboshi (2016), Maizatul *et al.*, (2012), Maliha and Rehana (2010), and Grace (2012). They all reported that, the emotional intelligence of female and male students are equally related to their academic achievements. This finding implies that gender has no any significant influence on emotional intelligence and academic achievement among secondary school male and female students. On the contrary, Olatoye (2010), reported that the emotional intelligence of female students is higher than that of the male students. They further asserted that the difference is one of the reasons why a girl child shows higher level of emotional intelligence compared to boys. The reason may probably be due to the fact girls receive significantly more education on emotions from parents than the boys right from home. This makes girls more emotionally competent than boys. The boys on the other hand are always perceived as stronger person compared to girls. This is why boys' emotional needs are in most cases not properly attended to as compared to that of the girls by parents. This could therefore be the reason why in Nigerian for instance, girls are given more protection by parents than boys in many parts of the country.

Generally, the result of this study showed that students with high emotional intelligence had significant improvement in their academic achievement than those that have low emotional intelligence. This is an indication that students' emotional intelligences are positively related to students' academic achievement. This is a pointer to the fact that emotional intelligence is one of the several factors determining the academic achievement of the students. In addition, this finding also revealed that gender has no significant influence on emotional intelligence and academic achievement among secondary school students.

In conclusion, this study has revealed that emotional intelligence is one of the several factors that determine the academic achievement of the students. Thus, efforts should be made to develop the emotional intelligence of students.

Recommendations

Based on the findings of this study, the following recommendations are made:

- Emotional intelligence should be included in curriculum of secondary school students and there should be periodic emotional intelligence training and retraining for teachers and school administrators for effective implementation of emotional intelligence curriculum.
- Parents need to pay more attention to the development of the emotional intelligence of their children right from the family level.

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